



The Impact of Purchases With Debit Cards on the Consumption of Unhealthy Food

Danial Shahrabi Farahani^{1*}, Mansour Momeni², Ezatollah Abbasian³, Amir Hadi Mohammadi⁴, Parisa Nikeghbal⁵

1. Master's Student of Marketing Management, University of Tehran, Tehran, Iran
2. Professor, Faculty of Management and Accounting, University of Tehran, Tehran, Iran
3. Associate Professor in Economics, Department of Public Administration, Faculty of Management, University of Tehran, Tehran, Iran
4. Master's Holder, Faculty of Management, University of Tehran, Tehran, Iran
5. Undergraduate Student of Medical Laboratory Sciences, Zahedan Branch, Islamic Azad University, Zahedan, Iran

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Abstract

The present study aimed to determine whether consumers are more likely to buy unhealthy food items when paying with debit cards compared to the time when they pay in cash, analyzing the effects of payment methods on the impulsive purchase of unhealthy products. To this end, the purchase behavior of a sample of 760 consumers was analyzed via a preliminary study and three main studies. To collect the data, consumer invoices, questionnaires, and purchase simulation techniques were used. The findings indicated that even though the participants who were randomly placed in the debit card payment group were aware of the unhealthiness of the food products, they still purchased such products, clearly showing their impulsive behavior. In cash purchases, the number of unhealthy food items in the shopping basket of consumers proved to be lower compared to when the consumers paid with debit cards. Furthermore, paying with debit cards reduced the pain of paying, ultimately raising the purchase of unhealthy food items.

Keywords: Pain of paying, Impulsive purchase, Unhealthy food items, Payment methods, Debit cards

Introduction

Over the past two decades, a rapid increase in obesity has been witnessed among consumers, the main reason for which might be the change in their lifestyle and nutrition patterns. The prevalence of the rates of obesity and overweightness among adults has been reported at 23 and 40 percent, respectively. The findings of various studies on the consumer diet during recent years have been indicative of an increase in the consumption of unhealthy foods, which in turn raises the risk of both general and abdominal obesity (Payab et al., 2015). The prevalence of obesity is higher in larger cities and its growth rate is also on the rise. In 2013, the prevalence of obesity for the age group of 20 to 84 years old was within the range of 15.4-34 percent (Moghimi-Dehkordi et al., 2013). A significant number of studies have shown a higher prevalence of obesity in urban areas, which can be partially due to the higher consumption of junk food (Maddah & Sharami, 2010).

In its 2005 report, the World Health Organization pointed to 54 and 70 percent rates of overweightness among *men* and *women*, respectively. Of the total 385,000 death cases

* Corresponding Author, Email: Shahrabidanial@alumni.ut.ac.ir

reported, about 268,000 (almost 70 percent) had been related to chronic diseases, mostly attributable to obesity and overweightness. As the consumption of unhealthy food items is obviously soaring in people, researchers have seriously paid attention to those factors affecting the consumers' decision-making process. Could the payment method be an influential factor when it comes to choosing healthy or unhealthy food products?

This is globally the age of electronic banking. Presently, a surge in relatively painless payment methods, including credit and debit cards, is noticed. The debit card network in Iran was practically established in 2002 with the introduction of the Interbank Information Transfer Network. The significant rise in the number of POS transactions indicates the increased usage of debit cards by consumers. While there have been more modern tools developed globally (payment by a cell phone, for instance), payments mostly happen using two methods, i.e., cash and debit cards. Debit cards are connected to an Electronic Card Payment Network. According to a Central Bank of Iran report, the number of electronic banking cards was close to 142 million in July 2015. Considering the country's population at the time, the number of cards per capita was about 1.36 for each Iranian individual¹. Now, the main question is whether the payment method affects the ability of the consumers to control their impulsive desire for purchasing unhealthy foods or not, i.e., whether the consumers are more likely to purchase unhealthy food items when they pay with debit cards compared to the time they pay in cash.

Theoretical Background

In 1979, Hirschman expressed concerns about the lack of studies on the effects of payment mechanisms from the point of view of purchasing behavior. In 2006, Schreft stated that the situation had not changed much yet (Schreft, 2006). Since 2006, however, a larger number of scholars have begun to focus on the issue but still the research gap exists, and this made the authors of this paper to investigate this matter. From an economic point of view, choosing cash payment or payment through debit cards may often be the same for the consumer. However, recent studies have shown that parting with money is not solely an economic activity. When consumers pay for goods and products, they will experience a psychological pain beyond economic costs (Prelec & Loewenstein, 1998). Various types of payment can create higher or lower pain (Prelec & Simester, 1998; Soman & Gourville, 1998). In particular, paying in cash (a mental form closer to the concept of money) is accompanied by a higher pain of payment compared to payment through banking cards (Raghbir & Srivastava, 2008).

Why does losing money cause pain? The brain areas for feeling physical pain and financial pain are the same (Knutson et al., 2007). In particular, predicting the loss of money activates the insula (Paulus & Stein, 2006), an area in the brain that is related to predicting pain. When describing the pain of losing money, people usually use terms associated with physical pain. Scholars look at social pain, the pain of losing money, and physical pain as common aspects of the pain system (MacDonald & Leary, 2005; Rick et al., 2008). The issue of *pain of paying* resulting from using money in terms of behavioral economy and consumer behavior goes back to the works of Zellermayer (1996), who defined the pain of paying as "direct and immediate displeasure or pain from the act of making a payment." The pain of paying may reduce the pleasure of buying or even dissuade the individual from doing the purchase. The physical nature of cash creates a precise awareness of the fact that a valuable thing is being transferred (Prelec & Simester, 1998; Raghbir & Srivastava, 2008; Soman, 2003; Thomas et al., 2011).

1. <https://www.cbi.ir/simplelist/15725.aspx>

In a study carried out by Morewedge et al. (2007), the consumers were asked to purchase lunch from a local shop. The first group of consumers were told that when paying, they should prioritize paying through their checking or deposit accounts. The second group was told to prioritize the cash in their wallets when paying. The result was that the first group spent money 36 percent more than the second group. It is also suggested that spending money might be painful since money is a source of protection and security. When we lose money, we feel more vulnerable (Zhou et al., 2008). Burgoyne and Lea (2006) showed that tangible money has a specific emotional meaning for people, which creates an emotional attachment *to* and dependence *on* a specific mode of payment. Nowadays, consumers have the option of using payment mechanisms other than cash when paying for their purchases, and these mechanisms are increasingly growing. Besides the conventional ways of payment such as cash and check, during recent years there has been a rapid spread of payment using plastic cards such as credit cards, charging cards, and debit cards (Green, 1997) (Figure 1). With the rapid progress in technology, new payment mechanisms come to the picture that are more sophisticated than cash-based transactions and common ways of carrying money (Berry, 1994; Soman & Gourville, 1998). While using new payment systems provides benefits such as cost-saving and optimal usage of resources, some social scholars and environmental activists are concerned about the negative impact of payment systems on the society and the environment. The reason is that these systems generally increase consumption and result in increased personal debt, reduced savings, and in turn over consumption (Khan & Craig-Lees, 2009; McDonald et al., 2006; Nocera, 2013; Zavestoski, 2002).

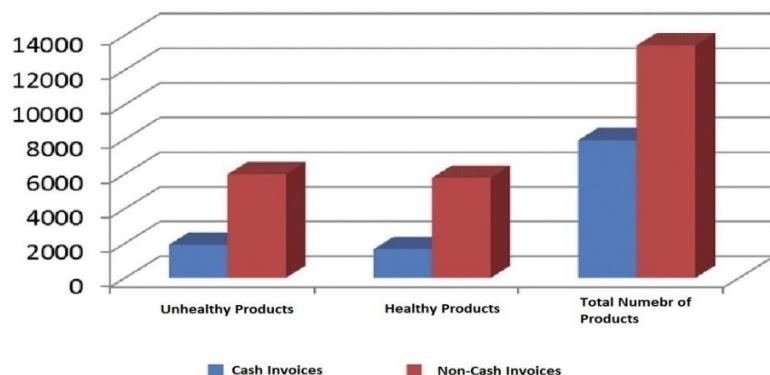


Figure. 1. Number of Unhealthy Products, Healthy Products, and Total Purchased Products in Cash and Non-Cash Invoices. Source: Green (1997)

Cash is the closest psychological form and the most painful payment method, which is in fact the physical representation of money (Raghbir & Srivastava, 2008; Soman, 2003; Soman & Gourville, 1998). The more abstract and mentally distant the payment method, the less the pain caused by the payment. Credit cards, banking cards, and other forms of plastic money are even less painful and more mentally distant; the act of swiping a card in a card reader obscures the value of the cash and distances individuals from the economic reality of the transaction (Feinberg, 1986; Raghbir & Srivastava, 2008).

Reduced time connection between the decision to purchase and the real separation from money (as in debit card payments) reduces the pain of paying at the time of purchase and consequently affects the amount of money spent by the individual on the goods or services purchased¹ (Thomas et al., 2011). Prelec and Loewenstein (1998) introduced the concept of

1. For more information, see Feinberg, 1986; Hirschman, 1979; Kivetz and Simonson, 2002; Prelec and Simester, 2001; Raghbir and Srivastava, 2008; Soman, 2001; Thomas et al., 2011.

coupling as a line between consumption and payment in the mind of the payer. In a field study (Thomas et al., 2011), the purchases of 1,000 homemakers during a 6-month period were analyzed. The findings indicated that compared to people who purchased using cash, people purchasing via credit cards were more likely to engage in impulse purchases and buy unhealthy food items (Figure 2).

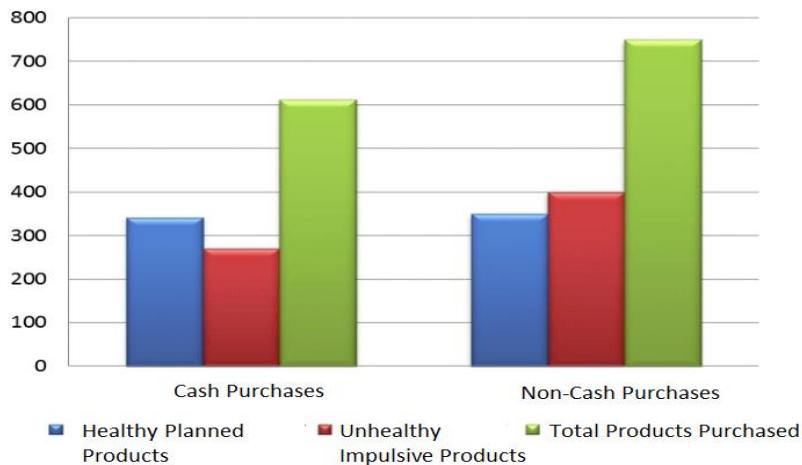


Figure 2. The Total Number of Products in Cash and Non-Cash Purchases
Source: Thomas et al., 2011

Many scholars agree that impulse purchases are based on spontaneous and involuntary desires, which are created by emotional images and can be in conflict with the long-term goals and plans of an individual (Baumeister et al., 1994; Gray, 1987; Rook, 1987; Wertenbroch, 1998). When consumers encounter harmful products like sweets and cream cakes, the associated emotional images create and reinforce the tendencies toward impulse buying decisions (Kivetz & Simonson, 2002). Inman et al. (2009) interviewed 2,300 consumers in various stores and noticed that when paying in cash, customers had a lower likelihood to commit an impulse purchase than when they pay by check or credit card. Chatterjee and Rose (2012) argued that the use of cash caused a more intense concentration on a product's costs as well as negative features whereas the payment via a credit card made the consumers focus more on the product's benefits and positive features. The instinctive desires can provoke the consumers to put unhealthy products in their shopping baskets even though they are aware of the harms caused by these items (Shiv & Fedorikhin, 2002). Environmental factors, which cause the feeling of pain, can eliminate impulsive desires and in turn prevent impulse buying (Metcalfe & Mischel, 1999). Other studies are indicative of the fact that a higher pain of paying may reduce instant satisfaction with a specific product (Shah et al., 2014; Soster et al., 2014).

Runnemark et al. (2015) focused on consumers' willingness to pay and payment methods, and their research suggested that the format of money matters. They found out that participants were more willing to pay for identical products with debit cards than with cash. The main reason is believed to be the representation of money, leading to the salience of the physical form and the salience of the amount paid by the card. Similar results were obtained by Park et al. (2020). When the participants in their research considered making cashless payments, the absence of the negative arousal reduced their attention to the health risks, which increased their purchase likelihood and their willingness to pay. The authors concluded that cash payments induce a higher level of negative arousal compared to cashless payments

which directs consumers' attention to risk factors involved in purchase decisions such as the health risks posed by food items.

Overall, consumers choosing a less painful payment mode that is psychologically farther than the actual act of payment look for better consumption opportunities and are likely to consume more of a specific product. This is due to the fact that the payment mode affects the pain experience, which in turn influences the balance between pain and joy (Shah et al., 2014).

The pain of paying obviously plays an important role in the consumer's self-control process. Increased self-control leads to a reduction in deviation from evaluating the costs and benefits at the time of purchase, deviations that may result in constant wastefulness (Prelec & Loewenstein, 1998; Prelec & Simester, 1998). The research context for the pain of paying among customers is rather poor and this makes the issue a little unclear and blurred. Previous research shows that people with larger shopping baskets are less sensitive to the pain of paying and they are more likely to engage in impulse purchase of food products (Ainslie & Haslam, 1992; Bell & Lattin, 1998).

In the present study, it is presumed that the payment method is an environmental factor: the pain caused by the payment can reduce the pleasure caused by neglect and this, in turn, can prevent impulse purchases. Therefore, a self-control strategy can be the use of payment methods with higher pain when purchasing food items, which will reduce the number of harmful foods and benefit the consumer in the long run. The main findings of the literature review are given in Appendix.

Research Background and Hypotheses

The current study aimed at identifying and analyzing the behaviors of people in terms of impulse purchase of food items and the effects of the modes of payment on the impulse purchase, as well as proposing strategies for the suitable type of payment. The study mainly sought an answer to the question of whether payment with debit cards affects the consumption of unhealthy foods. Moreover, the study aimed to determine if consumers are more likely to buy unhealthy foods when they pay with debit cards as compared to when they pay in cash. Suitable payment strategies for reducing the consumption of unhealthy foods as the result of the pain of paying, improving the shopping basket of the consumers, as well as the informed consumption of food items were the other important issues the study dealt with.

Hence, the study hypotheses were as following:

H1. The number of unhealthy food products in the consumer's shopping basket is fewer when paying in cash compared to when paying with debit cards.

H2. Paying through debit cards reduces the pain of paying and, in turn, increases the likelihood of purchasing unhealthy food items.

Research Methodology

The research hypotheses were tested using a preliminary study as well as three main studies. Once the required data were collected from the consumers using questionnaires (created by Google Forms) and purchase simulation, they were analyzed through the SPSS software. Questionnaires were distributed online and the respondents answered based on 5-point Likert scales. In the preliminary study, the attitudes of 100 consumers were sought on 88 highly-used food products in the customer shopping basket in terms of *unhealthiness* and *impulsiveness*. The results of the pre-study were considered as the basis for the categorization of the products in the following studies. In the first study, 384 invoices were randomly selected from among the invoices of a chain store in Tehran. In the second phase of the study,

the purchasing process was simulated through the selection of 20 products (the ones used in the pre-study), and 150 undergraduate and graduate students of the University of Tehran (48 percent female and 52 percent male) were asked to fill a questionnaire online. In the third study, 126 real-life customers (46 percent of whom were women) were asked to fill out the online questionnaire. Therefore, the total sample of this study included 760 people selected using a simple random sampling technique among consumers in Tehran city. Descriptive statistics were applied for the initial data. To review the normality of distribution, the Kolmogorov-Smirnov test was used in SPSS. In case the significance level for each variable was more than 0.05, data distribution was normal while at the significance level of less than 0.05, data distribution was not normal. In case the distribution of the variables was normal, the Spearman's rank correlation or the independent t-test would be used, where the observed significance would be compared with the standard significance level of $\alpha=0.05$ with the aim of testing the hypotheses. In case the distribution was not normal, the nonparametric Mann-Whitney U test would be used to assess the correlation among the variables (Table 1).

Table 1. Nonparametric Mann-Whitney U test

Measure	Output	First (Levene's test)		Second (t-test for equality of means)			Confidence levels	
		Default	F	Sig.	T	Sig.	Lower bound	Upper bound
Feeling regret after purchase	Equality or non-equality of variances	1.572 Equality of variances		0.212 Non-equality of variances	1.535 1.535	0.127 0.127	-0.014 -0.014	0.111 0.111

Study Phases

In the pre-study phase, we selected 88 groups of best-selling products in the shopping baskets of households based on the databases of the selected chain store to evaluate the extent of healthiness/unhealthiness and to compare the planned and impulsive food items. These product groups accounted for more than 98 percent of the items in the shopping basket. Then, 100 undergraduate and graduate students in the University of Tehran (43% female) participated in the study online. The criterion selected for scoring was a 9-point Likert scale ranging from healthy to unhealthy (with 1 standing for *very healthy* and 9 for *very unhealthy*) and from planned to impulsive (1 standing for *very planned* and 9 for *very impulsive*). The median, which was number 5 in the sorted list, was considered as the decision criterion. In case the average of responses on healthiness was less than 5, that product was categorized as a healthy product. Accordingly, if the average of responses on impulsiveness was less than 5, the product was categorized as planned and if it was more than 5, it was considered as impulsive. Moreover, in order to ensure that the data were not biased, we randomly selected 50 participants to answer the questions related to the unhealthiness of food categories and the remaining 50 were asked to answer the questions related to the impulsiveness of food categories. If the consumer did not consider a product unhealthy, he or she would not experience regret after purchase.

The first phase of the study was concerned with households with one or more members. The analyzed invoices contained more than 12 items, with a value of over 1,500,000 rials. This was due to the fact that some customers only visited the store to purchase specific items and the number of customers with few items on their invoices was very high. The selected invoices, covering December 2016, showed the payment method (cash or debit card) and the time of purchase (day of the week). Two types of indices were used for measuring the unhealthiness and impulsiveness of the shopping basket: simple average index and weighted average index. In

order to evaluate healthy or unhealthy as against planned or impulsive invoices, we used two indices of the ratio of the value of unhealthy (impulsive) products in each invoice to the total value of the invoice and the ratio of the number of unhealthy (impulsive) products in each invoice to the total value of the invoice. To evaluate the effects of the payment method on purchasing unhealthy products, the two indices of the relative value of the unhealthiness of the invoice and the relative number of unhealthy products in the invoice were compared for both cash and debit card invoices. To evaluate the effects of the payment method on purchasing impulsive products, the indices of relative value of the impulsiveness of the invoice and the relative number of impulsive products in the invoice were compared. In the complementary analysis, we compared the average value of each index for cash and debit card invoices to evaluate the effects of the payment method on total products in invoices. A correlation was observed between healthy and planned products in both groups. On the other hand, there was a significant correlation between unhealthy and impulsive products.

With other factors being controlled, the effects of the payment method on the purchasing process were simulated in the second phase of the study. Using the data from the pre-study, 10 highly unhealthy and impulsive products and 10 highly healthy and completely planned products were selected. In this purchasing simulation, the participants purchased the 20 products using cash or debit cards. The made-up scenario was the establishment of a new branch of a chain store in the district where the participants lived and the study was set up to appear as if it were being done by the company constructing the new branch. The participants were asked to imagine that they entered this about-to-open store and they were told that they could choose from among the available items. After collecting the data from each participant, the selected items were analyzed and the value of the shopping basket as well as value of each product was calculated based on dual categories. Healthy planned products and unhealthy impulsive products in the shopping baskets in both cash payment and card payment groups were evaluated. The products with the highest frequency were selected and the purchases of both groups and product categories were identified. In order to evaluate healthiness or unhealthiness of the shopping baskets, we used the two indices of relative value of healthiness (the rial value of healthy products in the basket divided by the total value of the basket) and relative value of unhealthiness (the rial value of unhealthy products in the basket divided by total number of products in the basket). Considering the objectives, four indices of the total number of products in the shopping basket, number of healthy products in the shopping basket, number of unhealthy products in the shopping basket, and relative value of unhealthiness of the shopping basket were considered. To review the effect of the payment mode on the purchase of unhealthy and impulsive products, we compared the average rates of relative value of impulsive invoices, relative number of impulsive invoices, relative value of unhealthy invoices, and relative number of unhealthy invoices in both groups.

In the third phase of the study, the effects of the pain of paying were evaluated. The first objective of this study was evaluating the accuracy of previous results. To this end, instead of using university students, a real sample was utilized. The second one was the measurement of the pain of paying caused by the payment method, and the third was the assessment of the effects of neglecting the price on reducing the pain of paying for those who pay with debit cards. The mean age of the participants was 38 years old. Several other variables, including the price recall, feeling regret, and the extent of the healthiness of the food items in the purchasing simulation were evaluated using the questionnaire after the purchase process. Immediately after performing the purchase, the participants were asked to remember the number of purchased items and the price. At this stage, the participants were not allowed to go over the list; they were asked to provide estimates based on what they recalled. The pain of paying experienced by the participants was measured using two indices, based on self-report.

The first index, which was considered a type of non-verbal index, used Emojis to measure the level of experienced pain. Furthermore, a verbal index was used, which was in fact the simplified form of the McGill Pain Questionnaire (MPQ). The participants were asked to indicate their feeling of regret caused by losing money if they purchased any of the food items mentioned in the questionnaire. To this end, a 5-point Likert scale was designed where 1 indicated lack of any feeling of regret and 5 indicated an intensive feeling of regret. Due to the likelihood of different individual perceptions, the participants were asked to express opinions on the extent of the healthiness of each of the 20 food items in the questionnaire based on a 9-point Likert scale. Finally, the demographic information including sex, age, and household income were collected from the participants.

Similar to the second phase, after collecting the data from each participant, the selected products were analyzed in order to calculate the value of the shopping basket. Moreover, the value of each product related to dual categorizations for both groups was calculated. The products with the highest frequencies were identified. The descriptive indices for shopping baskets and the number of purchased products were determined.

Results

The results of the pre-study phase indicated that there was a significant correlation between the healthiness of the product and the planned nature of the product in both groups of participants ($r = 0.44, p < 0.05$). On the other hand, since the significance level observed for the relationship between unhealthiness and impulsiveness was lower than 0.05, it can be said that there was a significant correlation between the unhealthiness of the product and impulsiveness in both groups of participants ($r = 0.60, p < 0.05$) (Tables 2 & 3).

Table 2. Output from Kolmogorov-Smirnov Test for the Variables of the Pre-Study Phase

Variable	Mean	Std. d.	Z	Sig.	Result
Participants' opinions on product healthiness or unhealthiness	3.983	2.375	0.161	0.000	Not normal
Participants' opinions on product impulsiveness or planned nature	4.696	2.222	0.127	0.001	Not normal

Table 3. Results of Correlation Test (Spearman's Correlation Coefficients) for the Relationship between the Opinions of the Two Groups of Participants

The product being planned	0.438 0.010	Correlation coefficient Sig.	The product being healthy
The product being impulsive	0.603 0.005	Correlation coefficient Sig.	The product being unhealthy

The results of the first phase of the study indicate that purchasing with debit cards had a significant positive impact on the impulsiveness and unhealthiness of the shopping basket, and compared to when they used cash, consumers had a stronger tendency to purchase unhealthy and impulsive food items when using debit cards. The results in both measurement methods were consistent in terms of number and value. It was also found that the effect of debit card payments on consuming unhealthy food items was stronger when the purchase was more impulsive. Therefore, H1 – positing that the number of unhealthy food items in the consumer's shopping basket is fewer when paying in cash compared to when paying with debit cards – is confirmed. This indicates that payment methods with a lower pain of paying

weaken the ability to control impulsive desires. In other words, non-cash payment methods directly affect the number of purchased items in general and the purchase of unhealthy and impulsive products in particular. Comparing the amount of purchase between weekdays and weekends is indicative of the fact that the number and value of purchased unhealthy and impulsive products are the same in both periods. Therefore, the purchase day has no effect on the number and value of unhealthy and impulsive products.

The findings of the second phase of the study indicated that respondents who paid by debit cards spent larger amounts on the purchase of harmful products than those paying in cash. The payment mode, however, revealed no influence on the amount spent by both groups on healthy products. This confirms H2, positing that payment through debit cards reduces the pain of paying and in turn raises the purchase of unhealthy food products. It is noteworthy that for reviewing the effect of the payment mode on the pain of paying, it is assumed that the pain of paying results from the payment method *only*. Together, phases 1 and 2 of the study indicated that the mode of payment could strengthen or weaken the impulse controls and reduce or raise the consumption of unhealthy products, respectively. However, these studies could not clarify the reason behind the effect of the payment mode on the purchase of unhealthy foods. The conceptual framework of this study indicates that this is because of the mutual effect of positive and negative emotional responses induced by impulse purchases and the pain of cash payment.

The findings of the third phase of the study showed that with a better sample and taking into account other intervening factors, the results of the second study were repeated. People still spend more on the purchase of unhealthy and impulsive products when they pay with debit cards compared to cash. It is once again concluded that the payment method does not have an impact on the number of healthy planned products in the shopping basket. The important result is the understanding of an underlying process, which is the pain of paying. Participants in the cash payment group reported higher pain compared to those paying with debit cards. It can be argued that the pain of paying acts as a mediator. Therefore, the third phase provides important support for the main assumptions, showing that the pain of paying plays an important functional role in controlling the impulse and selectively reduces the number of unhealthy and impulsive products in the shopping basket. While evaluating the variable of price recall, it is concluded that non-cash purchases increase the price recall error. In other words, the level of price recall in the cash payment method is higher than the non-cash payment method. The effect of paying attention to the price was evaluated in this study as one of the potential factors, and it was found that even when they paid attention to the price, the participants experienced reduced pain of paying when they paid with debit cards compared to when they paid in cash. In other words, the lower pain of paying when paying with debit cards was not due to neglecting the price since even when the participants paid attention to the price, paying with debit cards still reduced the pain (Table 5).

Table 4. Output from Kolmogorov-Smirnov Test for Variables in the Third Study

Variable	Mean	Std. d.	Z	Sig.	Result
Total number of products in the shopping basket	10.817	2.434	0.115	0.000	Not normal
Number of healthy products in the shopping basket	5.492	1.589	0.137	0.000	Not normal
Number of unhealthy products in the shopping basket	5.325	1.788	0.135	0.000	Not normal
Relative value of unhealthiness of the shopping basket	0.448	0.133	0.058	0.200	Normal
Regret for purchasing healthy products	1.526	0.195	0.117	0.000	Not normal
Regret for purchasing unhealthy products	4.143	0.278	0.137	0.000	Not normal
Regret for purchasing	2.835	0.178	0.078	0.059	Normal
Error ratio of price recall	0.202	0.183	0.165	0.000	Not normal
Pain of paying	4.873	1.461	0.084	0.028	Not normal

Table 5. Results of the Mann-Whitney Test for Comparing the Means in the Two Categories of Cash and Non-Cash Invoices

Measure	U Mann-Whitney	Z	Sig.
Number of unhealthy products	4245	-13.053	0.000
Number of impulsive products	3950.5	-13.324	0.000
Total number of products	7836.5	-9.744	0.000

As to the evaluation of the level of feeling regret caused by spending money, it can be concluded that cash purchases result in an increased feeling of regret when buying healthy products and the payment method does not affect the feeling of regret when purchasing unhealthy products. In other words, the cash payment method has a reverse impact on feeling regret when purchasing healthy products (Table 6). Finally, due to the likelihood of different perceptions by the participants, product healthiness in the purchasing simulation was measured again. As expected, the consumers considered unhealthy impulsive products unhealthier than healthy planned products. These results clearly indicated that despite the fact that participants who were randomly allocated to the debit card payment groups were aware of the products' unhealthiness, they still purchased more impulsive products, clearly pointing to their impulsive behavior. According to Ubel (2009), it can be said that the tendency to purchase impulsive products is not based on inference and justification. The participants clearly reported that the impulsive products they bought were unhealthy and they experienced regret after the purchase. However, when they were purchasing with debit cards, they had a desire to purchase such products. Therefore, the decisions made by the participants were influenced by the mutual impact of spontaneous emotions caused by the pain of paying and impulsive urges (Tables 6 and 7). The findings of the present study are generally in line with the findings of the studies done on transparency and the pain of paying by debit cards (Prelec & Loewenstein, 1998; Prelec & Simester, 1998; Soman, 2003; Soman, 2001; Van der Horst & Matthijsen, 2013; Zellermayer, 1996) (Tables 6, 8 and 9). Overall, the results add to our understanding of the consumer's behavior as well as the effects of the payment method on the behaviors of consumers.

Table 6. Results of Mann-Whitney Test for Comparing the Mean Value in Cash and Non-Cash Purchases

Variable	U Mann-Whitney	Z	Sig.
Feeling regret for purchasing healthy products	1554	-2.128	0.033
Feeling regret for purchasing unhealthy products	1951	-0.167	0.867

Table 7. Results of the Independent T-Test to Compare Regret in Two Groups of Cash and Non-Cash Purchases

Measure	Output	First (Levene's Test)		Second (T-Test for Equality of Means)			
		Default	F	Sig.	T	Sig.	Confidence Levels
							Lower bound Upper bound
Feeling regret after purchase	Equality of variances	1.572	0.212		1.535	0.127	-0.014 0.111
	Non-equality of variances				1.535	0.127	-0.014 0.111

Table 8. Results for the Mann-Whitney Test to Compare the Means in the Two Categories of Cash and Non-Cash Invoices

Measure	U Mann-Whitney	Z	Sig.
Relative value of unhealthy invoices	6,534.5	-10.940	0.000
Relative number of unhealthy invoices	3,793.5	-13.461	0.000

Table 9. Results of Mann–Whitney Test for Comparing the Means in the Two Categories of Cash and Non-Cash Invoices

Measure	U Mann-Whitney	Z	Sig.
Relative value of the impulsiveness of the invoice	4894.5	-12.448	0.000
Relative number of impulsive products in the invoice	4565.5	-12.751	0.000

Table 10. Output from Kolmogorov-Smirnov Test for the Variables of the Study

Variable	Mean	Std. D	Z	Sig.	Result
Total number of products in the shopping basket	10.873	2.591	0.099	0.001	Not normal
Number of healthy products in the shopping basket	5.453	1.540	0.136	0.000	Not normal
The number of unhealthy products in the shopping basket	5.420	1.792	0.114	0.000	Not normal
Relative value of unhealthiness of the shopping basket	0.538	0.117	0.049	0.200	Normal

Respondents' Demographic Information

In the third phase of the study, the respondents were asked about their demographic information including age, sex, and income. The statistical sample of this study consisted of almost equal numbers of men and women whose mean age was 38 years old. The sample included a total of 126 people with an average income of 2.5 million tomans a month (Table 11).

Table 11. Participants' Gender Information

Sex	Number	Percentage
Men	67	53.2
Women	59	46.8
Total	126	100.0

Of the total 126 respondents, 67 (53.2 percent) were men and the remaining 59 (46.8 percent) were women. Meanwhile, 3 subjects (2.4 percent) were in the age group of 20 years old or less, 42 (33.3 percent) in the age group of 21-30 years old, 31 (24.6 percent) in the age group of 31-40 years old, 21 (16.7 percent) in the age group of 41-50 years old, and 29 participants (23 percent) in the age group of 50⁺ years old (Table 12).

Table 12. Participants' Age Information

Age	Number	Percentage
20 years old or less	3	2.4
21-30 years old	42	33.3
31-40 years old	31	24.6
41-50 years old	21	16.7
50 ⁺ years old	29	23.0
Total	126	100.0

As to income, 11.1 percent of the respondents (equal to 14 persons) had an income of less than one million tomans, 30.2 percent (38 people) made between one and two million tomans, 25.4 percent (32 people) enjoyed an income of two to three million tomans, and 33.3 percent (42 people) had an income level of three to five million tomans per month (Table 13).

Table 13. Participants' Income Information

Monthly income (in Tomans)	Number	Percentage
Less than 1 million	14	11.1
1 to 2 million	38	30.2
2 to 3 million	32	25.4
3 to 5 million	42	33.3
Total	126	100.0

Conclusion

Having completed a pre-study and three main studies, the authors noticed the higher tendency of the consumers to purchase unhealthy food items when using debit cards instead of cash, confirming both hypotheses of the study. It was found that the number of unhealthy food items in the shopping basket of the consumers was fewer when they paid in cash than when they paid with debit cards. Moreover, paying with debit cards reduced the pain of paying and, as a result, increased the likelihood of purchasing unhealthy food items. In the first and second phases of the study, undergraduate and graduate students were analyzed while in the third and fourth phases, single-member households were considered.

In general, the results obtained from this study have important implications for the well-being and health of the consumers since the widespread increase of obesity and overweight and the efforts of consumers to regulate their impulsive responses have caused the public and the scientific community to pay more attention to this issue. In the complementary analysis, it was observed that cash purchase increases the feeling of regret after purchasing healthy products and the payment method does not influence the feeling of regret after purchasing unhealthy products.

The current study relies on the perspective of emotional processes and considers the pain of paying and instinctive factors as important variables. The reason behind the lower emotional influence of card payments compared to cash payments must be studied separately. Evaluating the extent of the effects of each of these factors on controlling the individual's impulses under various conditions is recommended to be studied in the future.

The simplest payment strategy which can be proposed based on the results of this study is that people should use cash when purchasing food items, particularly unhealthy and unplanned ones. This is not impossible since payment habits of individuals can be changed. This suggestion may seem unrealistic and impractical since the income of the majority of people is deposited into their bank accounts connected to debit cards. Therefore, using banking cards is widely common and if the recent trends reported by the CBI continue, using cash will decrease more rapidly and this means a change in the direction of trends¹. Moreover, this suggestion may not be feasible through public policies since from the point of view of the government, implementing e-payment methods provides a lot of benefits including the possibility of better control, extracting more accurate statistics, and monitoring people's revenues for collecting the tax. In addition, the rational and emotional benefits of debit cards raise the public tendency to use them. This issue can be better articulated in this way: encouraging people to carry a small amount of cash can be a suitable strategy. Another strategy can be the decision of an individual to have a long-term perspective and utilize the cost-benefit analysis. Controlling the costs and paying attention to managing personal expenditures can help the internalization of this perspective. One of the strategies that can be used by sellers to facilitate the purchase management and the consumption of food items can be creating a customer page on the store's portal in a way that the customers can access the purchase records and print a report of the statistics on the volume, value, and type of purchases on a monthly basis, for instance.

All the strategies proposed so far are focused on self-control; however, they are voluntary and rooted in the will of the individual. It is noteworthy that the effectiveness of such methods is limited due to various reasons, including the biased evaluations in mental accounting, limited capacity of individuals for rational future decision-making, difficulty in changing payment habits, presence of underlying factors for the selections by the consumer and the

1. Report on the Cash Flow Accounts by the Office for Payment Systems of the Central Bank of the Islamic Republic of Iran, www.cbi.ir

difficulty in changing all of them, the lack of the possibility of complete fulfillment of long-term implications by people, and the lack of access to alternatives for instant gratification. It can be said that the majority of these reasons are rooted in the cognitive limitations of the human mind. In addition, the decision to purchase harmful products is an instinctive response. As can be seen from the third phase of the study, while people are aware that some foods are unhealthy, they still purchase them. These instinctive factors may force the individual to purchase unhealthy products even though he or she is aware of their harmfulness. The best strategy from the perspective of the authors is to improve the usage of debit cards. The effect of the mode of payment on the consumption of unhealthy products by consumers has not been studied before. The findings of this study will in fact broaden the public understanding regarding the effects of payment methods on the behavior of the consumer. The empirical managerial contribution of this study will be to companies and organizations active in the field of health, so that they can make their consumers aware of impulsive purchases and adopt appropriate payment policies to reduce the ratio of unhealthy and harmful food products in their consumers' shopping baskets. The outcome will be an increase in consumer welfare by raising awareness on impulsive consumption and the improvement of the shopping basket of consumers, orientating the country's resources towards following a healthy lifestyle, ensuring public health and preventing obesity and overweight, and reducing the burden of healthcare costs on the health system of the country.

Limitations and Further Research

Previous research has shown individuals with bigger shopping baskets are less sensitive to the pain of payment and therefore buy more impulsive food items (Ainslie & Haslam, 1992; Bell & Lattin, 1998). This study has not included this matter in the conceptual model to avoid making the model complicated.

Moreover, this paper did not find any correlation between the day of the week (i.e., weekday or weekend) and value and quantity of the unhealthy and impulsive items in the shopping basket while Hirschman found such a correlation. Therefore, this matter requires more investigation.

Finally, there are two different opinions on the impact of payment method on the quantity and quality of purchases. One opinion identifies conditioning as a reason and the other relies on the pain of payment. This study follows the latter; however, it is not still clear that if the individual differences can lead to different outcomes, and if yes, how can it impact the feeling of pain. This can be a field to focus on in further research.

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Appendix

Review of Literature

Researcher (year)	Subject	Model/Main Variables	Statistical Population and Sample	Data Collection Method	Findings
Park et al. (2020)	Why Do Cashless Payments Increase Unhealthy Consumption? The Decision-Risk Inattention Hypothesis.	- Payment method - Willingness to Pay	American Consumers Study 1: 104 Study 2: 401	- Questionnaire - Purchase behavior analysis - Purchase simulation	cash payments induce a higher level of negative arousal compared to cashless payments which directs consumers' attention to risk factors involved in purchase decisions such as the health risks posed by food items.
Runnemark et al. (2015)	Do consumers pay more using debit cards than cash?	- Payment method - Willingness to Pay	Danish consumers; 82	- Questionnaire - Purchase behavior analysis	Participants were more willing to pay for identical products with debit cards than with cash.
Thomas et al. (2011)	How Credit Card Payments Increase Unhealthy Food Purchases: Visceral Regulation of Vices	- Pain of paying - Payment method - Frugality or lavishness	American consumers; - Study 1: 1,000 - Study 2: 151 - Study 3: 125	- Questionnaire - Factor analysis - T-test - Variance analysis	Payment via credit cards raises unhealthy food purchases. The pain of paying can prevent impulse responses and lead to decreased purchasing of harmful products.
Raghurir & Srivastava (2008)	Monopoly Money: The Effect of Payment Coupling and Form on Spending Behavior	- Payment coupling - Payment mode - Expenses	Indian consumers; - Study 1: 114 - Study 2: 57 - Study 3: 28 - Study 4: 130	- Questionnaire - Diagnostic analytics - Factor analysis	Payment by credit card is less painful and raises the expenses. Cash payment is more painful compared to other modes even when the modes differ.
Wansink & Chandon (2007)	The Biasing Health Halos of Fast-Food Restaurant Health Claims: Lower Calorie Estimates and Higher Side-Dish Consumption Intentions	- Calorie Purchase intention	Urban American consumers; - Study 1: 379 - Study 2: 316 - Study 3: 46 - Study 4: 214	- Questionnaire - In-depth interview - Variance analysis - T-test	People pay more attention to taste and fulfilling desires than the calorie and usefulness.
Kivetz & Keinan (2006)	Repenting Hyperopia: An Analysis of Self-Control Regrets	Regret after purchase and the effective factors	American students; - Study 1: 31 - Study 2: 69 - Study 3: 132	- Questionnaire - Diagnostic analytics - Variance analysis	Greater temporal separation between a choice and its assessment enhances the regret (or anticipated regret) of virtuous decisions (e.g., choosing work over pleasure). Time has a differential impact on the affective determinants of self-control regrets.
Raghunathan et al. (2006)	The Unhealthy = Tasty Intuition and Its Effects on Taste Inferences, Enjoyment, and Choice of Food Products	Purchase of unhealthy food products and the food image	Ordinary consumers; Study 1: 138 Study 2: 110 Study 3: 40 Study 4: 293	- Questionnaire on behavior analysis - Variance analysis	Unawareness about harms, weak will, and inaccurate product image are influential on the purchase of unhealthy food products.

Researcher (year)	Subject	Model/Main	Statistical	Data Collection	Findings
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	Variables	Population and Sample	Method		
Ramanathan & Menon (2006)	Time-Varying Effects of Chronic Hedonic Goals on Impulsive Behavior	Reviewing factors affecting impulse purchase	Consumers from Chicago; - Study 1: 96 - Study 2: 78 - Study 3: 84	The factor behind impulsive behavior is the seeking for pleasure. Activating a goal in search of pleasure raises the tendency for products, behaviors, and situations, which bring pleasure. Unwillingness happens simultaneously with a rise in impulsive behavior.	
Mishra et al. (2006)	Money: A Bias for the Whole	The role of bias in the spending of money and factors influencing it	American consumers; Study 1: 85 Study 2: 265 Study 3: 192 Study 4: 130	- Questionnaire - Variance analysis - T-test	Paying in cash causes a different emotional response compared to less obvious modes of payment. Individuals act more conservatively when spending physical money and have a higher tendency for payment modes other than cash while purchasing.
Kross et al. (2005)	When Asking "Why" Does not Hurt; Distinguishing Rumination from Reflective Processing of Negative Emotions	Psychological operations that enable individuals to process negative emotions and experiences without increasing negative effect	American consumers; Study 1: 155 Study 2: 133	- Questionnaire - In-depth interview - Factor analysis - Variance analysis	Informed thinking can reduce the intensity of negative emotions and in turn lead to the purchase of more healthy products.