

Behavioral Economics: Mental Accounting among Teenagers

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ABSTRACT

Mental accounting refers to the fact that people tend to code, categorize and evaluate activities when making decisions. While adults often use mental accounting as an effective decision-making tool, teenagers are still undergoing the process of cognitive development, and thus demonstrate different ways and strategies when using this tool to make decisions evolved sunk cost and loss. In this paper, we conduct an online questionnaire and compare the difference between teenagers' and adults' responses to each question. After analyzing the reason for these differences, some unique patterns are found in teenagers' mental accounting processes. Specifically, more mobile and ambiguous accounts are likely to be presented in teenagers with larger investments in relationships. Some of those differences can be interpreted using interdisciplinary explanations.

Keywords: Behavioral Economics, Mental Accounting, Sunk Cost, Loss Aversion

1. INTRODUCTION

The concept of "Mental Accounting" was brought up by Thaler in 1985 to describe "the set of cognitive operations used by individuals and households to code, categorize and evaluate financial activities" [1] and to explain the reason that people are affected by sunk cost [2]. Before that, it was often thought that money is fungible regardless of its source [3], which means that 100 dollars gained by salary paid and 100 dollars gained by bonus are equal to the people who receive it. However, in our daily lives, it's usually not the case. It is found that people tend to group money into categories and make budgets based on those categories, like creating many mental accounts [4]. For example, the 100 dollars received by salary may be categorized into the budget of food, whereas the 100 dollars received by bonus may be categorized into the budget of entertainment. That is, mental accounting can be viewed as a personal cognitive bias [5] in which people categorize their wealth based on the source of money and their importance [6].

However, as stated by Thaler in his paper *Mental Accounting Matters*, the ways that people create their mental accounts are very different [4]. Past works of literature tend to focus their effects on the general public, whereas the purpose of this paper is to explore how mental accounting influences teenagers in their daily confrontation choices. Specifically, we will in this paper

compare the difference between teenagers' and adults' choices related to sunk cost and loss. First, we construct and distributed an online questionnaire and compared the difference between teenagers' and adults' responses to each question. Then, we use the mental accounting aspect to analyze the reason for these differences. Last, we will discuss some difficulties that are especially faced by teenagers when they make daily decisions and give some recommendations to help them to better their decision-making process.

2. RESEARCH DESIGN

A survey has been conducted on people in Beijing. 57 questionnaires were distributed online and 55 were returned, which was consistent with 25 teenagers attendees (age 14 to 18) and 30 adults attendees (age 18 and above). All the questions are presented in English, but attendees are allowed to use translators. Before the survey, each attendee has signed the participant agreement which allows all the responses data to be used in this paper.

There are two parts included in the questionnaire (15 questions in total). The questions in each part are designed to test people's responses to different daily decisions including sunk cost, herd behavior, and loss. In the first part of the questionnaire, we used "the SCE-8 scale" developed by David Ronayne, Daniel Sgroi, and

Anthony Tuckwell, which includes five types of sunk cost-effort: time, money, emotional attachment, and confidence [7]. The types of sunk costs for each question are presented below in Table 1.

The second part contains 7 yes or no questions about people’s treatment of loss. The question designed in this part is based on the work of Shari De Baets and Marc

Buelens in their paper of Development of Loss Aversion Questionnaire, in which they already tested the viability of these questions to evaluate people’s loss aversion attitudes [8]. The types of loss for each question are presented in Table 2.

In this research, we deleted some of their questions that are not very suitable for teenagers to answer.

Table 1. Types of sunk costs for each question

	effort	time	money	emotion	confidence
1	√	√			
2	√			√	
3	√				
4		√			
5			√		
6				√	
7	√	√			√
8	√	√			√

Table 2. Types of loss for each question

1	Loss old stuff
2	Loss of ability to walk
3	Loss all belongings
4	Got fired but find a similar job
5	Talk behind my back
6	Loss of the familiar way of working(loss of good reputation)
7	Less pay

3. ANALYSIS

3.1 Sunk Cost Fallacy

Table 3 shows the percentage of teenagers and adults who undergo sunk cost fallacy when making decisions (which means that they choose to stick with their previous choice instead of the more rational one). According to the data in Tables 1 and 3, teenagers tend to be more irrational when facing the sunk cost of emotions, effort,

and time, while paying less attention to the sunk cost of money and confidence (that the percentage of teenagers considered sunk cost are more than 50% in question 1, 2, 4, 6, 7, and less than 50% in question 3, 5, 8).

Compared with adults, teenagers’ percentages are generally higher in every question. Although the data reflects the same pattern with teenagers in which adults also take more considerations of emotions, effort, and time, the range of teenagers’ data is also larger than the range of adults.

Table 3. Percentage of participants who undergo sunk cost fallacy

Question	1		2		3		4	
Age	Teen.	Adult	Teen.	Adult	Teen.	Adult	Teen.	Adult
Percentage(%)	52	47	56	33	32	40	52	40
Question	5		6		7		8	
Age	Teen.	Adult	Teen.	Adult	Teen.	Adult	Teen.	Adult
Percentage(%)	40	20	64	43	64	40	40	17

Sunk cost fallacy refers to the tendency to continue an endeavor [9]. Although, according to the traditional model, people would never consider sunk costs—things that have already been spent and cannot be recouped [10]—as part of their consideration, the effect of sunk costs cannot be overlooked in reality. Indicated by the consistency of the overall results’ trend between teenagers and adults, the tendency of mental accounts development has been continued after early adolescence [11] However, a higher rate of sunk cost fallacy among teenagers reflects the relatively immature development of their decision-making capacity. The gap in the efficient use of mental accounting between teenagers and their higher educated parents [12] may serve as the main reason for this phenomenon.

One of the competencies that teenagers often lack is to avoid “narrow framing” when using mental accounting. Compared with adults, teenagers tend to view each decision separately [13] and ignore other accounts that may be affected [14]. In this survey, participants sometimes are simultaneously facing more than one account, like question 1 needs the participants to concurrently balance their effort accounts and time accounts. Without special attention, teenagers are likely to include their sunk costs analysis in only the effort or the time account and neglect the other one affected, which leads to a poorer capacity of eliminating sunk costs.

Teenagers also tend to have more mobile mental account attributes, which means that their accounts are

easily overlapped: one sunk cost may be attributed to different or even the wrong accounts. When facing more complex decisions (in this survey the decisions related to multiple types of sunk costs), teenagers are inclined to be confused with which account these costs would belong to. As a result, the uncertainty of their choice is highly enhanced, which can be demonstrated by the larger range of teenagers’ data. Adolescents may misinterpret the sunk cost as a potential cost of another account. For example, the sunk cost of effort and time may be considered as a cost of emotion if they do not choose to stick to their previous action, and be mistakenly included in their decision-making process.

3.2 Loss Aversion

Table 4. shows the percentage of teenagers and adults who undergo loss aversion when making decisions. Generally, teenagers are less loss tolerant than adults as almost the percentage of teenagers in all questions are higher than adults except for questions 4 and 6. They both develop a similar pattern that is less tolerant with the loss of old stuff, jobs, and good reputation, and more tolerant with the loss of ability to walk and the payment (that both teenagers’ and adults’ percentage of questions 1, 4, 5 are all excess 50%, and the percentage of question 2 and 7 are all less than 50%). Teenagers become more tolerant when getting fired or changing their familiar way of working, as the percentage of questions 4 and 6 are higher in adults than in teenagers.

Table 4 Percentage of participants who undergo loss aversion

Question	1		2		3		4	
Age	Teen.	Adult	Teen.	Adult	Teen.	Adult	Teen.	Adult
Percentage(%)	92	87	44	27	56	43	52	80
Question	5		6		7			
Age	Teen.	Adult	Teen.	Adult	Teen.	Adult		
Percentage(%)	72	63	40	60	28	23		

Twice as painful as gains [15], the instinct to avoid loss than to acquire gains [16] is believed to be one of the humans’ inherited behavioral patterns. Historical economists dug deeper into the embodiment of loss aversion in daily choices by using mental accounting: within one account, instead of focusing on the pure cost of one decision, people often evaluate a set of decisions as a whole and avoid closing the account with an eventual loss. Thus, the results of the second part of the questionnaire can illustrate some unique properties of mental accounting among teenagers.

Since teenagers are undergoing the development process of mental accounting capacity, they tend to have fewer and more ambiguous accounts compared to adults, which may contribute to a more fungible of money within

their accounts. In the situation particularly suited to this survey, the “money” in the preceding sentence refers to anything that can be considered as a “loss” in the questionnaire, including the loss of old stuff, jobs, good reputation, and so on. Adults tend to clearly distribute their budgets into different accounts, which means the money loss in one account can not be easily transferred. However, the situation may be completely opposite within teenagers. Because of their relatively ambiguous boundary of accounts, the money transfer becomes a lot easier, which amplifies even a small loss to a large, cross-accounts loss. The money in those ambiguous accounts is also more likely to be expensed as they can be allocated into more than one category [17], and increase the overall less loss tolerance among teenagers.

4. DISCUSSION

One primary psychological change during adolescence is identity development, which evolves the confirmation of a normative change in their thoughts about themselves [18]. During this process, teenagers need to keep trying on different behaviors (in this situation different divisions of mental accounts) to discover their own identity [19], which automatically resulting more ambiguous and mobile accounts, a contradiction phenomenon to the optimal situation where the boundaries of accounts are obvious. However, as this process is crucial to their mental development, it is better not to intervene over-enthusiastically.

Teenagers also tend to have unstable emotions, paying huge attention to relationships. At a stage where social skills rapidly developed, adolescents invest heavily in friendships, which contributes to their relatively higher considerations of the sunk cost of emotion [20]. More weights are given to social rewards than adults [21]. From a biological point of view, the increased release of hormones in teenagers preoccupies a position in building their desire for physical and emotional relationships, but not for jobs or the way of working. In this survey, for example, data shows an extremely high rate of sunk cost consideration and loss aversion behavior in relation and emotion-related questions. When facing those dilemmas in life, is better for teenagers to take this as natural than panic-stricken, and slowly pass this transition period to maturity.

5. CONCLUSION

Teenagers are undergoing the establishment of mental accounting-related decision-making competence. According to the results of the questionnaire, teenagers generally get the same trend of results as adults, but experience more sunk cost fallacy and loss tolerance, with a larger degree of uncertainty. Both adolescents and adults take extra consideration of sunk cost in emotions, effort, and time, and less attention to the sunk cost of money and confidence. Adolescents' responses are especially extreme in emotional and relationship-related questions. Differences that arise in the decisions related to sunk cost and loss between teenagers and adults can be interpreted by the special characteristics of mental accounting during adolescence. The lack of competence to avoid "narrow framing" makes teenagers likely to ignore other affected accounts than the most obvious one, and the misallocation of the cost may serve as the reason for uncertainty of teenager's answer. Moreover, the fewer and more ambiguous boundaries may contribute to a more fungible of money within the accounts, amplifying the size of the loss.

Teenagers' special processes, such as identity development and a large investment in relationships, may temporarily obstruct their path to adult rationality. But

patience and hope are the key elements to successfully passing this transition period to mental maturity.

One weakness of using questionnaires is that the question is standardized without giving the participants space to freely express their thoughts. The choices are limited and people may act differently in their real-life from what they answered. In addition, the situations in this questionnaire are made-up for both teenagers and adults. Some of them, like the question about losing a job, are not suitable for teenagers to answer as they do not undergo a similar situation. Further improvement strategies may include using free-response questions in the questionnaire or taking interviews.

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