

Mental Accounting and Self-Control

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Karlsson, N. Mental accounting and self-control. *Göteborg Psychological Reports*, 1998, 28, No. 2. The behavioral life-cycle theory of H. Shefrin and R. Thaler (1988) assumes that people classify assets in three mental accounts: current income, current assets, and future income. The present study tested the hypothesis that future consumption is considered to a lesser extent when money is available as current income compared to when current assets have to be used. This hypothesis specifies how mental accounts serve as a self-control strategy, in that concern for future consumption is tied to the use of current assets while only short-term preferences are considered when using a current income. Two experiments were conducted in which undergraduates made fictitious choices between buying or not buying an attractive durable good when having future expenses. Different groups of subjects could use current assets or current income to pay for the durable good. In line with the hypothesis it was found in Experiment 1 that the future expenses had a greater negative impact on the decisiveness to buy when using current assets than when using current income. Experiment 2 also investigated the importance of different types of uncertainty of the future expenses. It was found that the uncertainty of the future expense imposed by a greater distance in time (i. e., increased implicit risk) increased the difference in decisiveness to buy between current assets and current income.

Keywords: Decision making, intertemporal choice, mental accounting.

People are facing a variety of economic decisions concerning earning, spending, and saving money. In many cases such economic decisions are interrelated or dependent on each other. For instance, deciding to buy a new CD player may make it necessary to postpone repairing the washing machine, or spending a nice evening at a restaurant tonight may mean

Author note: This research was financially supported by grant #94-0086:2C to Professor Tommy Gärling from the Swedish Council for Social Research. I thank Tommy Gärling and Marcus Selart for their help during various phases of this research.

that there is less money to spend on the holiday next month. In this way people may see decisions as related. Dependencies are not restricted to simultaneous decisions. Both previous decisions or outcomes and future decisions or outcomes may be seen as related. How and why people relate or categorize decision outcomes is addressed in studies on mental accounting.

Mental accounting refers to a process of coding, categorizing, and evaluating (primarily financial) outcomes (Thaler, 1980, 1985; Henderson & Peterson, 1992; Kahneman & Tversky, 1984; Tversky & Kahneman, 1981). In the behavioral life-cycle theory of Shefrin and Thaler (1988) it is assumed that people categorize assets (wealth) in three mental accounts: current income, current assets, and future income. It is furthermore assumed that the propensity to consume is greatest from the current-income account and smallest from the future-income account. In a similar vein, the concept of mental account has been used to describe how outcomes may be evaluated jointly (i.e., in the same mental account) or separately. For instance, Tversky and Kahneman (1981) in this way explained their finding that a large majority of subjects chose not to replace a lost theater ticket while they chose to buy a ticket after having lost the equivalent sum of money. It was suggested that they evaluated the loss of a ticket and the price of a new ticket in the same mental account while the loss of money and the price of a ticket were evaluated separately. Although sharing the common feature of categorizing outcomes, it is important to distinguish between the two ways in which mental accounting has been used. Ranyard (1995) thus proposed a conceptual distinction between specific and on-going mental accounts. That is, while the mental accounts referred to by Tversky and Kahneman (1981) are specific to the decision to be made and formed in relation to that decision, in the mental accounts referred to by Shefrin and Thaler (1988) financial outcomes are categorized into already defined mental accounts which are part of people's financial knowledge or understanding.

In a survey of students' expectations of future consumption, Shefrin and Thaler (1988) obtained direct support for the predictions from the behavioral life-cycle theory in that subjects expected to consume more of a windfall during a year if money was coded as current income than if it was coded as current assets, and that they expected to consume least if it was coded as future income. However, in a similar study by Selart, Karlsson, and Gärling (1997) of a Swedish nationwide sample and a student sample, the results were different. It was found that subjects expected to consume more from current assets than from current income. Since a windfall received immediately as a lump sum was assumed to be coded as current assets and a windfall received as increments per month during the year was assumed to be coded as current income, there was a difference in when the windfall was received in time. The results were better accounted for by temporal discounting of future outcomes (e.g., Loewenstein & Prelec, 1992).

In a study of specific buying decisions (Karlsson, Gärling, & Selart, 1997) supporting the behavioral life-cycle theory, confounding of mental accounts and temporal discounting of future outcomes were avoided. It was found that willingness to buy was higher when subjects used money from current income than from current assets. In another study that further validated the hypothesized role of mental accounts in buying decisions, Karlsson, Gärling, and Selart (in press) found that factors like compatibility between saving and consumption motives and the total amount of assets had effects on the willingness to use current assets but not on the willingness to use current income. These results were in line with the idea that the use of mental accounts is motivated by self-control. The present study further investigates how mental accounts may serve as a self-control strategy.

In studies of intertemporal choice, people have been found to have time-inconsistent preferences (Ainslie, 1975; Benzion, Rapoport, & Yagil, 1989; Loewenstein & Prelec, 1992). For instance, people may reverse their preferences from a more distant and larger reward to a closer but smaller reward as the occurrences of these rewards are getting closer in time. However, these inconsistencies are not something that people necessarily and generally are unaware of. Quite to the contrary, people may often adopt different self-control strategies in order to overcome such inconsistent preferences. Self-control typically involves efforts to resist temporary or short-term preferences in order to achieve longer-term preferences. Hoch and Loewenstein (1991) proposed two general classes of self-control strategies: those that reduce desire and those that overcome desire through willpower. In contrast to such desire-reducing and willpower strategies, the decomposition of wealth into mental accounts may serve as a self-control strategy at a more general level since it is not formed in relation to a specific situation or object.

The extent to which people consider future consequences of their behavior has been shown to differ between individuals (Strathman, Gleicher, Boninger, & Edwards, 1994). In a recent study (Daniel, 1997) it was found that consideration of future consequences and other individual differences in variables associated with intertemporal choices, such as time preference, delay of gratification, and self-control, account for differences in saving (see also, Wahlund & Gunnarson, 1997; Wärneryd, 1995). It could also be the case that the extent to which people consider future consequences varies between situations. The greater willingness to buy when using money from current income than from current assets may, in part, stem from a greater consideration of future consequences or consumption when using current assets.

The present study aimed at testing the hypothesis that in buying decisions future consumption is considered to a lesser extent when money is available as current income compared to when current assets have to be used. This hypothesis constitutes a specification of how the use of mental accounts serve as a self-control strategy in that concern for future

consumption is tied to the use of current assets while only the more immediate consumption is considered when using current income.

Experiment 1

In order to test the hypothesis that people in buying decisions to a lesser extent take into account future consumption when using current income than when using current assets, in Experiment 1 subjects made hypothetical buying decisions. In three different groups, subjects were asked to make choices between buying and not buying an attractive durable good. They did that in situations where they also knew that they had a future expense that had to be paid in a specified period of time. The future expense was expressed either as a single payment or as several payments spread out over a period of time. Situations were also included without future expenses. Due to the discounting of future expenses (e.g., Loewenstein & Prelec, 1992) the impact of the future expense was for all groups expected to decrease the farther in the future it had to be paid.

In line with the hypothesis that mental accounting is a self-control strategy, it was expected that the future expense has a different impact on the willingness to buy depending on where money is available. More precisely, when having a known future expense compared to having no future expense it was expected that the willingness to buy is reduced more when subjects have to use current assets than when they use current income. The three groups differed with respect to where the money was available to pay for the durable good in case of buying. This was done by presenting different temporary income-change situations. In this way, one group had to use current assets while the other two groups could use current income to buy the durable good. The latter two groups differed in that current income was either sufficient or insufficient to cover the future expense.

Including both single and multiple future expenses made it possible to investigate if the expected difference between using current income and current assets are due to differences in processing of information. Another hypothesis to be tested was therefore that the difference in willingness to buy between current income and current assets are greater for multiple than single future expenses since the former may be assumed to demand more comprehensive processing.

In summary, the following two hypotheses are tested in Experiment 1: (1) When having a known future expense, the willingness to buy will decrease more when having to use current assets than when current income may be used; (2) The difference in willingness to buy between current income and current assets will be greater when having multiple than when having single future expenses.

Method

Subjects

Sixty undergraduates at Göteborg University (24 men and 36 women) participated in the experiment. They were randomly assigned to one of three different groups with an approximately balanced number of men and women. The subjects' mean age was 23.9 years within a range of 19 and 35 years. They were all paid \$7 for their participation.

Materials and Procedure

Subjects were presented with fictitious choices to buy a CD player or a bookcase. In each choice scenario, subjects were asked to imagine that they had a certain amount of savings, that they had received their monthly salary, and that they had a future expense that had to be paid at a specified future time. The future expense was varied within subjects and had to be paid at a single point in time, in 1 or 12 months, or divided over several months. When divided over several months it had to be paid either during 12 months, during 6 months starting next month, or during 6 months starting in 7 months. Subjects were also presented with scenarios without a future expense.

The different groups of subjects were presented with scenarios that differed with respect to in which mental account money was available to pay for the durable good. This was done by presenting different temporary income changes to the three groups. In the income increase sufficient (IIS) group, subjects were asked to imagine that they had received a temporary income increase which was large enough to cover both the price of the durable good and the future expense. For the income increase insufficient (III) group, the temporary income increase was large enough to cover the price of the durable good but not both the durable good and the future expense. For the ordinary income (OI) group, savings had to be used to pay for the durable good.

The price for the durable good, the future expense, and the income change are presented in Table 1. The future expenses were presented at two different levels. These are displayed for the three different income-change conditions. The amounts of savings are also displayed. As can be seen, these were varied so that total assets were equal for the different income-change conditions.

Table 1

Price for the Durable Good, Income Change, Amount of Savings, and Future Expense for the Three Different Income-change Conditions. (All Amounts are Expressed in Swedish Crowns. A Swedish Crown is Approximately Equal to .15 USD)

Condition	Price	Income increase	Amount of savings	Future expense
Income increase sufficient (IIS)	2000	5000	3000	3000
	2000	5000	3000	1800
Income increase insufficient (III)	2000	2000	6000	3000
	2000	2000	6000	1800
Ordinary income (OI)	2000	0	8000	3000
	2000	0	8000	1800

Subjects served in groups of six or less. The experiment was conducted on a computer. In general instructions subjects were told that they would be presented with fictitious buying scenarios which they were asked to imagine and respond to as if they were real. For each scenario subjects were asked to make a choice between buying or not buying a durable good. They were also asked to rate how decisive they felt to choose the way they did. The ratings were made on a continuous scale from 0 to 100, where 0 was defined as not at all decisive, 50 as rather decisive, and 100 as very decisive. The scenarios were presented to subjects in different randomized orders. The sessions lasted for about 20 minutes after which subjects were debriefed and paid.

Results and Discussion

The ratings of decisiveness were given a positive sign if subjects chose to buy and a negative sign if they chose not to buy. Thus, the dependent variable ranged from -100 to 100 with a positive value indicating a preference to buy and a negative value a preference for not buying.

In Figure 1 the decisiveness to buy when having no future expense and when having a future expense at different points or periods in time are presented for the different income-change conditions. The order of the different future expenses is displayed so that the more of the future expense that had to be paid in the future, the farther it is positioned along the abscissa. As can be seen, the decisiveness to buy is much smaller when having future expenses. Furthermore, the future expense seems to have less impact on the decisiveness to buy the more distant it is in time.

According to a 3 (income-change condition) by 6 (timing of future expense) ANOVA with repeated measures on the last factor, the timing of the future expense was significant, $F(5, 285) = 44.6, p < .001$. Multiple comparisons with Bonferroni corrected t -tests at a familywise error rate of $p = .05$ revealed that the decisiveness to buy when having no future expense was significantly greater than every case of having a future expense. The decisiveness to buy was significantly smaller for the single future expense in 1 month and significantly greater for the single future expense in 12 months, compared to the other future expenses. There were no significant differences in decisiveness to buy between the multiple future expenses.

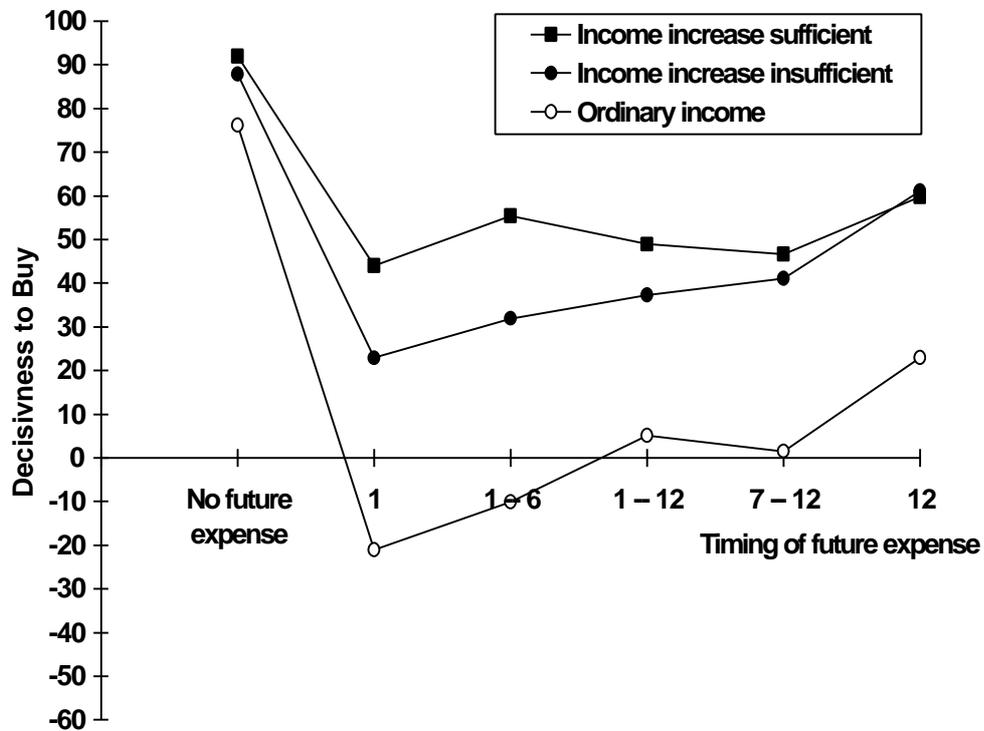


Figure 1. Mean decisiveness to buy for the different income-change conditions and for the different future expenses. The timing of future expense displays the month(s) from now when the expenses had to be paid.

The decisiveness to buy was smallest when having to use current assets, that is, for the OI group. It was also smaller for the III group than for the IIS group. The main effect of income-change condition was significant, $F(2, 57) = 6.1, p < .01$. However, the effect was modified by a significant interaction between income-change and timing of the future expense, $F(10, 285) = 2.4, p < .01$. As can be seen in Figure 1, in line with

the hypothesis the differences in decisiveness to buy between the income-change conditions are greater when there is a future expense than when there is none. Conducting separate one-way ANOVAs for the different types of future expenses revealed significant effects of income-change conditions for all future expenses as well as for no future expense. According to Bonferroni corrected *t*-tests, there were no significant differences in decisiveness to buy between the IIS group and the III group. The decisiveness to buy was significantly smaller at a familywise error rate of $p=.05$ for the OI group than for the IIS group for all future expenses. The differences in decisiveness to buy between the OI group and the III group were significant at a familywise error rate of $p=.10$ for all future expenses except for the multiple future expenses that had to be paid during 12 months.

The differences in decisiveness to buy between current income and current assets were not greater for the multiple future expenses than for the single future expenses. Thus, the results do not support the hypothesis that the greater consideration of future expenses when using current assets than when using current income are due to differences in comprehensiveness of processing.

In summary, the results of Experiment 1 showed that the impact of the future expenses differed for the different income-change conditions. In line with the hypothesis, the impact of future expenses were greater when current assets had to be used (i.e., the OI group) than when current income could be used (i.e., the IIS and III groups). No support was obtained for the hypothesis that this difference between using current income and current assets are due to differences in comprehensiveness of processing. There may, however, be other factors accounting for the difference in impact of a future expense on the use of current income and current assets. One such factor is the uncertainty of the future economic situation, which is investigated in Experiment 2.

Experiment 2

The aim of Experiment 2 was to further test that future expenses are taken into account in a buying decision to a greater extent when using current assets than when using current income. A future consequence that people may want to avoid is to end up in a difficult economic situation implying that they are not able to buy things needed or wanted. An important factor may therefore be the degree of uncertainty in the future economic situation. The possibilities to anticipate or control the consequences may be more difficult if the future economic situation is more uncertain. In Experiment 2 the hypothesis was tested that the uncertainty of the future economic situation is an important factor accounting for the greater willingness to buy when using current income

than when using current assets (Karlsson et al., 1997, in press; Shefrin & Thaler, 1988).

The uncertainty of future income and future expenses are two important sources of the uncertainty of the future economic situation. Experiment 2 minimized the uncertainty of the future income, only varying the degree of uncertainty of the future expense. Minimizing the uncertainty of the future income is important because current income changes may affect people's expectations of future income. That is, if receiving a temporary income increase people may expect future income increases to be more likely than when receiving an ordinary income. Hence, such differences in expectation of future income may account for differences in the impact of future expenses on the willingness to buy. The degree of uncertainty of the future expense was varied in three different ways: (1) Uncertainty of the amount of the future expense; (2) Uncertainty of whether one will have the future expense or not; (3) Implicit risk, that is, an uncertainty assumed to be imposed by the distance in time of a future outcome (Benzion et al., 1989; Keren & Reolofsma, 1995; Stevenson, 1986). Any distant outcome or event is considered less certain than its more immediate counterpart. Hence, a more distant future expense is felt more uncertain than a future expense that is closer in time.

If people use mental accounts as a self-control strategy, they may be more concerned about future outcomes and future consequences when using current assets than when using current income for consumption. If uncertainty about the future economic situation is an important motive for using mental accounts, it should be expected that there is a greater difference in the willingness to buy between current assets and current income when the future economic situation is more uncertain. By varying the degree of uncertainty of a future expense in three different ways the three following hypotheses were tested: (1) Uncertainty about the amount of a future expense will increase the difference in willingness to buy from current assets and current income than when there is no uncertainty. (2) Uncertainty about whether one will have a future expense or not will increase the difference in willingness to buy from current assets and current income than when there is no such uncertainty. (3) Uncertainty imposed by a greater distance in time to a future expense (i.e., implicit risk) will increase the difference in willingness to buy from current assets and current income than when the future expense is close in time.

Method

Subjects

Another forty three undergraduates at Göteborg University (15 men and 28 women) participated in the experiment. An approximately equal

number of men and women were randomly assigned to two different groups. The subjects mean age was 25.0 years within a range of 19 and 49 years. All subjects were paid \$7 for their participation.

Materials and Procedure

As in Experiment 1, subjects were presented fictitious choices to buy a CD player or a bookcase. In each scenario they were asked to imagine that they had a certain amount of savings, that they had received their monthly salary, and that they had a future expense that had to be paid at a specified future time. In order to minimize the uncertainty of future income, subjects were asked to imagine that their future income was stable and that they would receive their normal income for at least a year.

The future expense was varied within subjects. In three different scenarios the future expense was said to be a certain SEK 1000, SEK 3000, or SEK 5000. In another scenario the amount of the future expense was said to be uncertain, and that it could be between SEK 1000 and SEK 5000. In still another scenario it was uncertain if one would have a future expense of SEK 3000 or not. Subjects were asked to imagine that it was equally likely that there would be a future expense as that there would not. Each scenario was presented twice. One where the future expense had to be paid in 1 month and in another where the future expense had to be paid in 12 months. A scenario without a future expense was also included. All scenarios were presented with both a CD player and a bookcase as the product of choice.

Subjects were allocated to one of two groups. These two groups differed with respect to in which mental account money was available to pay for the durable good. In one group subjects were asked to imagine that they had received a temporary income increase (the II group), and they could use their current income to pay for the durable good. The income increase (SEK 2000) was large enough to cover the price of the durable good but not both the durable good and the future expense. In another group subjects were asked to imagine that they had received their ordinary income (the OI group), and they had to use savings to pay for the durable good. The amount of savings was SEK 6000 for the income-increase group and SEK 8000 for the ordinary-income group. Hence, total assets were equal for the two groups.

Subjects made choices between buying and not buying the durable good, and they rated on a continuous scale from 0 to 100 how decisive they felt to make the choices. The scenarios were presented in different randomized orders. Each session lasted for about 20 minutes after which subjects were debriefed and paid.

Results and Discussion

As in Experiment 1, the ratings of decisiveness were given a positive sign if subjects chose to buy and a negative sign if they chose not to buy. In this way the dependent variable ranged from -100 to 100.

The results for the decisiveness to buy for the different future expenses and for the two income-change conditions are displayed in Table 2. Also displayed are the results when there was no future expense. As can be seen, the decisiveness to buy was greater for the II group than for the OI group when there was no future expense. This difference was significant according to a separate *t*-test, $t(41) = 2.34$, $p < .05$. It was expected that uncertainty about the amount of the future expense and uncertainty about whether there will be a future expense or not would increase the difference in the decisiveness to buy between using current income and current assets. However, no such effect of uncertainty was found. According to a 2 (income-change condition) by 5 (type of future expense) by 2 (time of future expense) ANOVA with repeated measures on the last two factors, there was no significant interaction between income change and type of future expense, $F(4, 164) = 1.2$, $p = .30$.

As expected, the uncertainty imposed by a greater distance in time to the future expense (i.e., implicit risk) increased the difference in decisiveness to buy between using current income and current assets. When the future expense had to be paid in 12 months, the decisiveness to buy was greater for the II group than for the OI group. This was true for every type of future expense. For the future expenses that had to be paid in 1 month, the differences between the two income-change groups were smaller. Furthermore, when the future expense was a certain SEK 5000 and an uncertain amount between SEK 1000 and SEK 5000, the decisiveness to buy was even greater for the OI group. The differences between the income-change conditions for the different timing of the future expense was substantiated by a significant interaction, $F(1, 41) = 4.66$, $p < .05$. Hence, support was obtained for the hypothesis that uncertainty imposed by a greater distance in time to a future expense (i.e., implicit risk) increased the difference in willingness to buy from current assets and current income than when the future expense is close in time.

Table 2
Mean Decisiveness to Buy for the Different Income-change Conditions and Future Expenses

Type of future expense	Income increase		Ordinary income	
	Future expense in 1 month	Future expense in 12 months	Future expense in 1 month	Future expense in 12 months
No future expense	79.69		44.43	
SEK 1000	24.40	78.45	18.52	41.07
SEK 3000	-38.62	39.07	-50.52	12.61
SEK 5000	-80.83	0.38	-61.11	-29.75
SEK 1000 - 5000	-63.43	20.33	-48.75	2.52
(0.5) SEK 3000	-34.50	53.98	-41.98	23.34

The ANOVA furthermore revealed a significant effect of the type of future expense on the decisiveness to buy, $F(4, 164) = 55.99, p < .001$. As can be seen in Table 2, the greater the future expense the lower the decisiveness to buy. When the future expense was an uncertain amount between SEK 1000 and SEK 5000, the decisiveness to buy was greater than when the future expense was SEK 5000 but less than when it was SEK 3000. The impact of the future expense on the decisiveness to buy was much greater when it had to be paid in 1 month than when it had to be paid in 12 months. This difference was significant, $F(1, 41) = 77.76, p < .001$. There was furthermore a significant interaction between time of the future expense and type of future expense, $F(4, 164) = 5.68, p < .001$. The difference in decisiveness to buy between a future expense in 1 month and in 12 months was smallest for the future expense of SEK 1000 and it was greatest for the uncertain future expense of SEK 3000.

In summary, the results of Experiment 2 indicated that only when the future expenses were more distant in time, and thus more uncertain in terms of implicit risk, the decisiveness to buy were significantly greater for current income than for current assets.

General Discussion

The decomposition of wealth into different mental accounts from which the propensity to consume differs have been discussed as a way of practicing self-control (Shefrin & Thaler, 1988, Thaler, 1993; Thaler & Shefrin, 1986). A specification of how mental accounts may serve as a self-control strategy is that people allow themselves to more readily spend a current income because they do not consider future consumption to the same extent as when they use current assets. In line with this, the primary aim of the present study was to investigate whether people in buying decisions take into account future consumption to a greater extent when using current assets than when using current income.

The results of Experiment 1 supported the hypothesis that future expenses have a more negative impact on the decisiveness to buy when using current assets than when using current income. Thus, in buying decisions people may think about future expenses as competing for the same economic resources to a greater extent when these are categorized as current assets than when they are categorized as current income. To put it differently, future consequences are of greater concern when using current assets than when using current income.

Since people probably want to avoid ending up in a future difficult economic situation where they are not able to buy things needed or wanted, an important factor may be the degree of uncertainty in the future economic situation. In Experiment 2 the hypothesis was tested that a greater uncertainty of the future economic situation makes the difference in decisiveness to buy from current assets and current income greater. Support was obtained for this hypothesis in that the decisiveness to buy was significantly greater from current income than current assets when a future expense was more distant in time compared to when it was closer in time. In this case, the greater distance in time imposes uncertainty. Such an uncertainty has been labeled implicit risk (Benzion et al., 1989; Stevenson, 1986). No effects of uncertainty were, however, found when it was manipulated as uncertainty in the amount of the future expense or as uncertainty of whether there would be a future expense or not. A difference that may be important is that to a greater extent than for these latter uncertainties, the uncertainty imposed by a greater distance in time is associated to the future economic situation rather than the future expense only. However, since no effects were found for uncertainty of amount and uncertainty of whether there would be a future expense or not, doubts may be raised against the interpretation of the effect of a greater distance in time in terms of implicit risk. An alternative interpretation is that the time horizon for the future expenses that are included are longer for the current-assets account than for the current-income account.

An important difference between the two experiments was that the uncertainty of future incomes was minimized in Experiment 2. In line with the reasoning that a greater uncertainty of future outcomes makes the difference in the willingness to buy between current income and current assets greater, the difference between these two mental accounts was greater in Experiment 1. This was most pronounced for the future expenses that were closer in time. However, the most important finding, documented in both experiments, was that future expenses was taken into account and decreased the decisiveness to buy to a greater extent when using current assets than when using current income. Hence, mental accounts serve as a self-control strategy, in that concern for future consumption is more tied to the use of current assets while current income are more readily spent on immediate consumption.

To take future consumption into account to a greater extent when using current assets than when using current income specifies how mental accounting may serve as a self-control strategy. However, when studying self-control in experimental settings as in the present study the importance of factors like temptation and impulsiveness are downplayed. Such factors may be of importance for how mental accounting is applied in real life situations. Still, the results from the present study suggests that people take into account future consumption differently depending on which mental account they use money from and this may be significant evaluations people bring into buying decisions.

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