Effects of mental accounting on intertemporal choices

Karlsson Niklas; Gärling, Tommy; Selart, Marcus

Veröffentlichungsversion / Published Version
Arbeitspapier / working paper

Effects of Mental Accounting on Intertemporal Choice

Niklas Karlsson, Tommy Gärling, and Marcus Selart
Department of Psychology
Göteborg University

Karlsson, N., Gärling, T., & Selart, M. Effects of mental accounting on intertemporal choice. *Göteborg Psychological Reports*, 1997, *27*, No. 5. Two experiments with undergraduates as subjects were carried out with the aim of replicating and extending previous results showing that the implication of the behavioral life-cycle hypothesis (H. M. Shefrin & R. H. Thaler, 1988) that people classify assets in different mental accounts (current income, current assets, and future income) may explain how consumption choices are influenced by temporary income changes. In both experiments subjects made fictitious choices between paying for a good in cash or according to a more expensive installment plan after they had received an income which was either less, the same, or larger than usual. In Experiment 1 subjects were supposed to have savings so that the total assets were equal, whereas in Experiment 2 the total assets varied. The results of both experiments supported the role of mental accounts in demonstrating that subjects were unwilling to pay in cash after an income decrease even though they had access to saved money. Thus, in effect they chose to pay more for the good than they had to. Indicating a need for further refinement of the concept of mental account, choices to pay in cash after an income decrease tended to be more frequent when the consumption and savings motives were compatible than when they were incompatible. Furthermore, increasing the total assets made subjects more willing to pay in cash after an income decrease.

Key words: Decision making, mental accounting, prior outcomes, intertemporal choice.

How people cognitively describe decision outcomes is the focus of much research (Gärling, Karlsson, Romanus, & Selart, in press). In this more general context mental accounting refers to a process of categorizing

---

Author note: This research was financially supported by grant #94-0086:2C to the second author from the Swedish Council for Social Research.

outcomes (Henderson & Peterson, 1992; Tversky & Kahneman, 1981). In their behavioral life-cycle hypothesis, Shefrin and Thaler (1988, 1992; Thaler & Shefrin, 1981) similarly used mental accounting as a description of how people code and impose restrictions on monetary assets. According to this theory, people categorize assets in three mental accounts: current income, current assets, and future income. An important implication for economic theory is that the principle of fungability of money is violated (Thaler, 1985, 1990).

Tversky and Kahneman (1981, p. 456) defined a mental account as "an outcome frame which specifies (i) the set of elementary outcomes that are evaluated jointly and the manner in which they are combined, and (ii) a reference outcome that is considered neutral or normal." In presenting different scenarios to subjects, Tversky and Kahneman (1981) found that a larger percentage would buy a new theater ticket if they had lost the equivalent amount of money as compared to the percentage of subjects that would replace a lost theater ticket. As an explanation of these results they suggested that subjects evaluated the loss of the 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. This coding of outcomes into mental accounts is specific to the decision to be made. It can be distinguished from the mental accounts referred to by Shefrin and Thaler in their behavioral life-cycle hypothesis (1988, 1992) which instead are a priori held mental accounts that are part of people's financial knowledge. Ranyard (1995) makes a conceptual distinction between the formation of specific mental accounts and on-going mental accounts. He argues that the latter are higher-order and more stable cognitive structures. Although these on-going mental accounts have attracted some research (Heath, 1995; Hirst, Joyce, & Schadewald, 1994; Selart, Karlsson & Gärling, in press; Shefrin & Thaler, 1988, 1992; Thaler, 1990; Winett & Lewis, 1995), the impact they have on decisions have not been extensively investigated.

In line with the behavioral life-cycle hypothesis (Shefrin & Thaler, 1988, 1992), Karlsson, Gärling, and Selart (1996) found that the propensity to consume reflected in fictitious buying decisions was lower when subjects had to use their current assets rather than current income, although total assets were the same in the two cases. Alternative explanations based on the renewable-resources model (Linville & Fischer, 1991) and the loss-sensitivity principle (Gärling & Romanus, 1996; Romanus, Karlsson, & Gärling, in press) were not consistent with the results. In contrast to the hypothesis of mental accounting, these theories predict that the motive for consumption (i.e., replacing something broken or buying something desired for long) would interact with type of income change (i.e., income decrease and using current assets or income increase and using current income) in determining the propensity to buy.

In intertemporal choice (Loewenstein, 1988), immediate utility is weighed against future utility. Restricting the use of assets by forming mental accounts may serve the purpose of a self-control device. The aim of self-control devices is to strengthen power to resist immediate consumption to gain larger benefits in the future. Avoiding tempting

situations, precommitment, and bundling of costs are examples of such devices (Hoch & Loewenstein, 1991). Mental accounting may, as a part of a financial knowledge (Ranyard, 1995), in contrast to other self-control devices be formed on a more general level and not in relation to specific situations or desires. As such a more general self-control device, its use is of major concern for investigation. More caution and unwillingness to use current assets than current income may reflect that long-term preferences to a larger extent are considered when using current assets. In line with this, we wanted to investigate the influence of compatibility between saving and consumption motives and the amount of total assets on mental accounting, and more specifically that these factors may be more important when using current assets than current income.

The aim of the present study was thus to replicate and extend the previous results (Karlsson et al., 1996) supporting mental accounting as an explanation of the effect of prior outcomes in the form of temporary income changes on intertemporal choices. Specifically, since saving motives have received considerable attention in earlier work, as for instance in Keynes (1936), Katona (1975), Ferber (1973), and Lindqvist (1981) (see also Wärneryd, 1989), it may be questioned whether such motives affect how willing people are to use savings (current assets) when facing buying decisions. Lindqvist (1981) distinguished between four main motives for saving: cash management, buffer for unforeseen emergencies, financial means for attaining a desired goal, and wealth management. There are also different motives for consumption, as for instance buying to replace something or buying something that has been desired for a long time. When questions about whether or not to use current savings are at stake, an important factor may be the compatibility between the motive held for these savings and the motive for consumption. Our hypothesis is that unwillingness to use current savings as predicted from the concept of mental account is reduced if the motives for saving and consumption are compatible. That is, if the consumption motive is, for instance, to replace something accidentally broken, the willingness to use current savings is expected to be greater if the saving motive is to have a buffer for unforeseen expenses (compatible) than if it is to attain something desired (non-compatible).

The prediction from the behavioral life-cycle hypothesis (Shefrin & Thaler, 1988, 1992) is that the propensity to consume is greater if money is taken from a current spendable income account than from current assets. In the present study, subjects are presented with hypothetical buying situations. In these situations they are facing choices between paying immediately in cash or paying according to a more expensive installment plan. By presenting different income-change conditions in Experiment 1, money for consumption was available in different mental accounts. This procedure thus makes it possible to compare willingness to use money from different mental accounts to pay in cash rather than choosing the installment-plan alternative. In line with the purpose of the study to investigate the importance of mental accounts for how people's consumption choices are affected by temporary income changes, the total

assets available to subjects were equal. In contrast, in Experiment 2 total assets were systematically varied to investigate whether willingness to pay in cash from different mental accounts are equally affected by the total amount of saved money. If it is not, this would be another factor which modify how mental accounts constrain consumption choices.

Experiment 1

The aim of Experiment 1 was to investigate the use of mental accounts in buying decisions and, in particular, to investigate the significance of compatibility between saving and consumption motives for such decisions. Subjects were asked to make hypothetical payment decisions, either to pay for a durable good immediately in cash or by a more expensive installment plan. They were presented with situations in which the income was less, the same, or larger than usual. There were four such income-change situations; one in which money for consumption is available as an income increase, one in which income increase plus ordinary income can be used, one in which ordinary income plus savings can be used, and, finally, one in which savings have to be used. According to the behavioral life-cycle hypothesis (Shefrin & Thaler, 1988, 1992), the propensity to pay in cash should decrease when ordinary income plus savings have to be used[1], and decrease further when savings alone have to be used.

In addition to the different income-change conditions varied within subjects, different groups of subjects were given four different versions in which different motives for saving and consumption were crossed. The motives for saving were either saving for a buffer or saving for a desired goal, and the motives for consumption either to replace something accidentally broken or to buy something desired for long. Hence, in the saving for a buffer conditions, the motive for consumption was either compatible or noncompatible, and likewise, in the saving for a desired goal conditions the consumption motive was either compatible or noncompatible. The hypothesis is that the unwillingness to use savings will decrease when saving and consumption motives are compatible.

Method

[1] Buying for the good according to an installment plan is identical to using future income. According to the behavioral life-cycle hypothesis, people are more reluctant to use future income than current assets or current income. Apparently, since subjects in all conditions made the same choices between paying in cash or according to an installment plan, we were not able to test this implication of the hypothesis. The reason why we asked subjects to make financing decisions rather than buying decisions as in Karlsson et al. (1996) was that this forced them to choose between different accounts.

Subjects

Sixty four undergraduates at Göteborg University, 36 women and 28 men, participated as subjects in return for the equivalent of $7 in payment. Subjects were randomly assigned to four different groups, with 16 subjects in each group and with an equal number of women and men in the four groups.

Materials

Subjects were presented with fictitious choices to pay for a durable good immediately in cash or by a more expensive installment plan. Every subject was presented with 16 situations in which income change, saving amount, and product varied. There were four different income-change conditions: either an income increase larger than the price of the product, an income increase smaller than the price, an ordinary income, or an income decrease. The amount of savings was varied so that total assets were equal for the income-change conditions. The products that the subjects imagined that they bought were a CD player, a bookcase, an answering machine, or a writing table. For the situations with the CD player and the bookcase, all amounts (price, amount of income change, and amount of savings) were twice as high as for the situations with the answering machine and the writing table.

In the condition with an income increase larger than the price, subjects were told that they had received an income increase of $215[2] or $430, and that they had $215 or $430, respectively, saved in a bank account. In the condition in which an income increase was smaller than the price, subjects had received an income increase of $72 or $143, and their savings were $358 or $717, respectively. When subjects were told that they had received their ordinary income, they had $430 or $860 in savings. In the income-decrease condition, the income decrease was $215 or $430 and they had $645 or $1290, respectively, in savings. The price for the product they bought was either $143 or $287. The buying situations were displayed and responded to on a computer.

Procedure

Subjects served in groups of four or less. In a general instruction 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. Subjects were introduced to a pre-test example before they started.

The experiment used a mixed factorial design with consumption motive (2 levels) and saving motive (2 levels) as between-subject factors and income change (4 levels) as a within-subject factor. For half of the subjects

[2] These amounts were in Swedish Crowns expressed in even hundreds ($1 is approximately equal to SEK 7).

the consumption motive was to attain something long desired. The subjects in these conditions were asked to imagine that they owned a product (e.g., a CD player) but that they had been thinking about buying a new and better one for a long time. For the other half of subjects the consumption motive was to replace something accidentally broken. They were, for instance, asked to imagine that their CD player had accidentally broken and that they therefore wanted to buy a new one. The two different saving motives were either to save in order to have a buffer for unforeseen expenses or to save in order to be able to buy something special they wanted to have. Half of the subjects were presented with the former and the other half with the latter of these two saving motives. Altogether there were thus four groups; subjects who saved for a buffer with either compatible or noncompatible consumption motive and subjects ho saved for attaining a desired goal with compatible or noncompatible consumption motive.

In all situations subjects were asked to imagine that they had found a product that they liked and wanted to buy, and that they could pay either immediately in cash or by a five-month installment plan. Subjects were then told that they had received an income change or an ordinary income and how much they had saved in a bank account. Furthermore, subjects were told that they normally had $143 (or $72) left over at the end of each month and that it was not possible to increase this amount by cutting down on expenses. For each situation subjects were asked to make the choice as if it was real between paying $287 (or $143) immediately in cash or paying by installment $64 (or $32) immediately plus $64 (or $32) each of the following four months. They were also asked to rate how likely they were to choose the way they did. Ratings were made on a continuous scale from 0 to 100, where 0 was defined as not very likely, 50 as rather likely, and 100 as very likely.

The scenarios were presented to subjects in an individually randomized order. The sessions lasted for about 20 minutes, after which subjects were debriefed and paid.

Results

The propensity to pay in cash was computed by multiplying each choice with the likelihood rating. Choices were coded as 1 if paying in cash and -1 if paying by installment. Thus, the dependent variable ranged from -100 to 100[3] with a positive value indicating a preference to pay immediately in cash and a negative value indicating a preference to postpone payment by paying by installment.

As can be seen in Table 1, the propensity to pay in cash decreases in the ordinary income and income-decrease conditions. In these conditions,

[3] All analyses reported below were also performed on choice proportions with almost identical results.

current savings have to be used and this result is thus in line with the prediction from the behavioral life-cycle hypothesis. A 2 (saving motive: buffer vs. goal) by 2 (consumption motive: replacing something broken vs. buying something long desired) by 4 (income change: income increase larger than price vs. income increase smaller than price vs. ordinary income vs. income decrease) ANOVA with repeated measures on the last factor revealed that the main effect of income change was significant, $F(1.98, 118.9) = 72.27$, $p<.001$, after Greenhouse-Geisser correction of the degrees of freedom. According to separate Bonferroni corrected *t*-tests at $p=.05$, all differences between income-change conditions in propensity to pay in cash were significant, except the difference between the income-increase conditions (larger than the price vs. smaller than the price).

Table 1
Mean Propensity to Pay in Cash in the Different Income-change Conditions

Income-change condition			
Income decrease	Ordinary income	Income increase (< price)	Income increase (> price)
6.6	55.0	77.1	82.3

In Figure 1 the propensity to pay in cash in the income-change conditions for the compatible or noncompatible consumption and saving motives are displayed. A three-way interaction effect was expected from the hypothesis that the propensity to use current savings to pay in cash is increasing when motives for saving and consumption are compatible. According to the ANOVA, the expected three-way interaction between income change, saving motive, and consumption motive was significant, $F(1.98, 118.9) = 3.98$, $p<.05$, after Greenhouse-Geisser correction of the degrees of freedom. However, the interaction was not exactly as expected. As can be seen, there are differences between the different between-subjects conditions when subjects received an income decrease or an ordinary income. In these cases the propensity to use saved money for paying in cash was lower when the saving motive was to have a buffer and the consumption motive to buy something long desired rather than to replace something broken. There were however no such effects of compatibility between saving for something long desired and the two consumption motives. Separate Bonferroni-corrected *t*-tests at p=.05 revealed that the only reliable differences were between the mean for the noncompatible motives of saving to have a buffer and buying something long desired and the other means in the income-decrease condition. In the

different groups, the differences between income decrease and the remaining within-subject conditions were significant. A significant difference was also obtained between ordinary income and the income-increase conditions when the saving motive was to have a buffer and the consumption motive to buy something long desired.

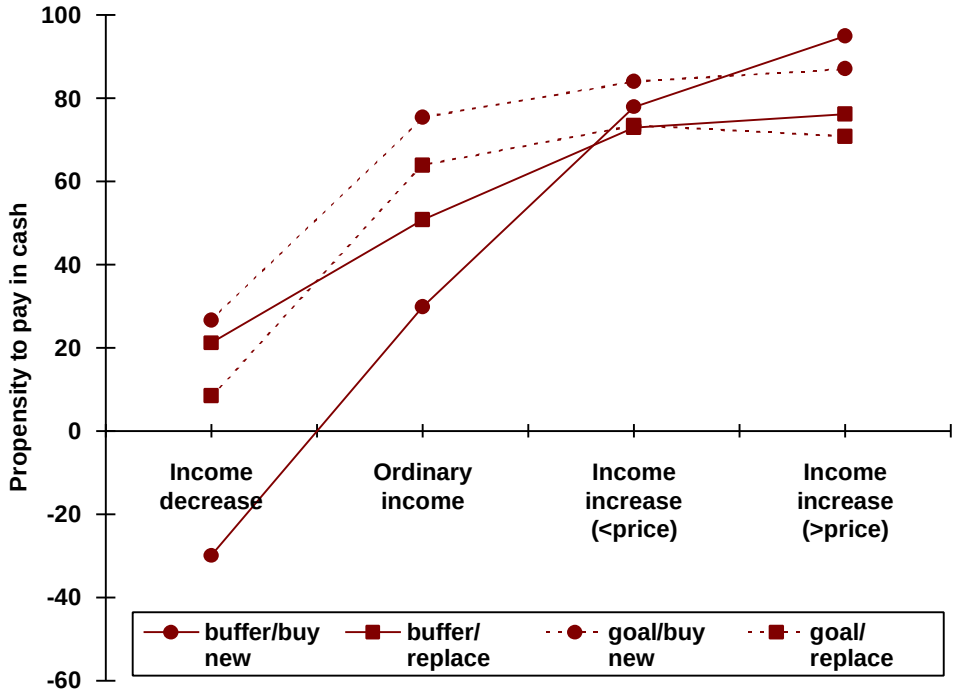

Figure 1. Mean propensity to pay in cash in different income-change conditions for compatible and noncompatible saving and consumption motives.

Discussion

The results supported the prediction from the behavioral life-cycle hypothesis (Shefrin & Thaler, 1988, 1992) that people are more willing to use current income than current assets for consumption. Overall, the subjects were more prone to pay in cash than by a more expensive installment plan in the conditions where they could use their current income than in the conditions where they had to use current savings. Note that in previous research it was found that subjects expected to consume more from current income than current assets (Shefrin & Thaler, 1988, 1992), whereas the present results show a direct effect of mental accounts on specific buying decisions.

Furthermore, the results partly supported the hypothesis that the propensity to pay in cash when current savings had to be used increases if

the motive for saving and consumption are compatible. When the saving motive was to have a buffer, the willingness to use current savings was greater for the compatible consumption motive to replace something accidentally broken than for the noncompatible consumption motive. However, when the saving motive was to attain a desired goal, there were no differences between the compatible and noncompatible consumption motives in the willingness to use current savings to pay in cash.

As a possible explanation of this latter result, irrespective of the saving motive subjects may impose a limit on how much they want to use of their savings. How large the amount is set for such a limit may be influenced by several factors. The amount of savings may be one factor, the saving motive another. To impose a limit and thus to have an amount of savings left over is conceptually similar to the motive to have a buffer. This saving motive has also been found to be regarded as more basic and important (Lindqvist, 1981). In post-experimental interview questions asked to subjects about the importance of different saving motives, 75 % regarded saving for a buffer to be more important than attaining a desired goal. Hence, when the motive for saving is to have a buffer for unforeseen expenses, replacing something accidentally broken is compatible and buying something long desired is noncompatible with this saving motive. However, when the saving motive is to attain a desired goal it is possible that a lower amount is adopted as a limit and that the remaining money is considered to be saved for attaining a desired goal. In this case, there are thus mixed motives, both compatible and noncompatible with the consumption motives.

Experiment 2

A temporary income change implies a change in total assets relative to what is expected or normally received. That is, to receive an income decrease or an income increase implies that the total assets are less or more, respectively, compared to if an ordinary income had been received. Although this perceived change in total assets cannot account for the results of Experiment 1, it is conceivable that the amount of total assets affect the propensity to pay in cash. In other words, the propensity to pay in cash may vary with the amount of money available. However, as emphasized in prospect theory (Kahneman & Tversky, 1979), losses and gains are evaluated differently. Furthermore, according to Peeters and Czapinski (1990) and Taylor (1991), losses or negative events receive greater attention and are processed more comprehensively. This may imply that people consider total assets only when receiving an income decrease.

Another possibility raised by the results of Experiment 1 is that subjects impose a limit on how much they are willing to use of their savings. If people adjust this limit to the amount of savings they have,

then an effect of total assets on the propensity to pay in cash after an income decrease will be counteracted.

As in Experiment 1, subjects were asked to make hypothetical payment decisions, either to pay for a durable in cash or by a more expensive installment plan. Subjects were presented with three different income-change situations, one in which money for consumption is available as an income increase, one in which ordinary income plus savings can be used, and one income-decrease situation in which savings have to be used. Furthermore, subjects were told that they had money saved in a bank account. For each income-change condition there were four different amounts of savings. In line with the behavioral life-cycle hypothesis (Shefrin & Thaler, 1988, 1992), it is expected that the propensity to pay in cash is reduced for the ordinary-income condition where some current savings have to be used and further reduced for the income-decrease condition where current savings alone must be used. It is also expected that the propensity to pay in cash is only affected by total assets in the income-decrease condition.

In contrast to Experiment 1, only the noncompatible saving and consumption motives were induced, that is, saving to attain a desired goal but buying to replace something accidentally broken and saving to have a buffer for unforeseen expenses but buying something desired for a long time. In the previous experiment, the propensity to pay in cash was greater when subjects had to use current savings that were saved for attaining a desired goal than when the motive for saving was to have a buffer. As a possible explanation of this unexpected difference, it was hypothesized that saving to attain a desired goal is perceived as a mixed motive, both compatible and noncompatible with the consumption motive to replace something accidentally broken. In line with this, it is expected that the propensity to pay in cash is greater for buying to replace something broken when saving to attain a desired goal than for buying something long desired when saving to have a buffer.

Method

Subjects

Thirty-two undergraduates at Göteborg University, 22 women and 10 men, participated in the study. They received the equivalent of $7 for their participation. Subjects were randomly assigned to two equally large groups.

Materials

As in Experiment 1 subjects were presented with fictitious choices to pay for a durable good immediately in cash or by a more expensive installment plan. Every subject was presented with 24 scenarios in which income change and saving amount varied. The income change was either

an income increase larger than the price of the durable, an ordinary income (i.e., no income change), or an income decrease. Hence, money for paying in cash was available as current income in the income-increase condition, as current income plus current savings in the ordinary-income condition, and as current savings in the income-decrease condition. In each income-change condition there were four different situations in which amount of savings available in a bank account varied. There were furthermore two levels of income changes. One level was twice as high as the other, and the price of the durable and the amounts of savings were also twice as high for the high level.

In the income-change conditions subjects were told that they had received either an income increase of $430 or $215, an ordinary income, or an income decrease of $430 or $215. In income-change conditions at the high level, subjects were told that they had $860, $1290, $1710, and $2140 saved in a bank account. In the income-change conditions at the low level, the saving amounts were $430, $645, $860, and $1070. The durable good that subjects bought was a CD player. The price was $287 and $143 for the high and low levels, respectively.

Procedure

The procedure in Experiment 2 was the same as in Experiment 1. However, only the noncompatible consumption and saving motives were used. Half of the subjects were asked to imagine that they owned a CD player but that they had been thinking about buying a new and better one for a long time. This group of subjects were also told that their savings was a buffer for unforeseen expenses. The other half of subjects were asked to imagine that their CD player had accidentally broken and that they therefore wanted to buy a new one. For these subjects the saving motive was to be able to buy something special they wanted to have.

For each situation subjects were asked to make a choice as if it was real between paying $287 (or $143) immediately in cash or paying by installment, $64 (or $32) immediately plus $64 (or $32) the following four months. They were also asked to rate on a scale from 0 to 100 how likely they were to choose the way they did.

Results

As in Experiment 1, the dependent variable was computed by multiplying each choice with its likelihood rating. It ranged from -100 to 100 where a positive value indicates a preference to pay immediately in cash and a negative value a preference to pay by installment.

As Figure 2 reveals, the propensity to pay in cash is greater in the income increase than in the ordinary income conditions and greater in the ordinary income than in the income decrease conditions. A 2 (motive: saving to have a buffer and buying something long desired vs. saving for a goal and replacing something broken) by 3 (income change: income decrease vs. ordinary income vs. income increase) by 4 (asset level: lowest vs. second lowest vs. second highest vs. highest) by 2 (replicate: low vs. high level) ANOVA with repeated measures on the three last factors was performed. According to this ANOVA, the difference in propensity to pay in cash between the three income-change conditions was significant, $F(1.42, 42.61) = 30.15$, $p<.001$, after Greenhouse-Geisser correction of the degrees of freedom. Separate Bonferroni corrected *t*-tests at $p<.05$ substantiated that there were significant differences in propensity to pay in cash between all income-change conditions.

According to the ANOVA, there was also a significant main effect of total asset level on the propensity to pay in cash, $F(2.68, 80.44) = 9.06$, $p<.001$, after Greenhouse-Geisser correction of the degrees of freedom. This effect was however modified by a significant two-way interaction between income change and asset level, $F(4.04, 121.25) = 6.23$, $p<.001$, after Greenhouse-Geisser correction of the degrees of freedom. Separate repeated measures ANOVAs for each income-change condition revealed as expected that asset level only had a significant effect on the propensity to pay in cash in the income-decrease condition, $F(3, 90) = 11.99$, $p<.001$. However, further tests by means of Bonferroni corrected t-tests at $p<.05$ in the income-decrease condition showed that only the lowest asset level differed significantly from the higher asset levels (the difference between the second lowest and highest asset level approached significance at $p=.087$).

The propensity to pay in cash was greater in the condition saving to have a buffer and buying something long desired ($M = 68.4$) than in the condition saving for a goal and replacing something broken ($M = 50.7$). This was not expected but the difference between the conditions did not reach significance ($p>.20$). There were furthermore no significant interaction effects involving differences between the conditions.

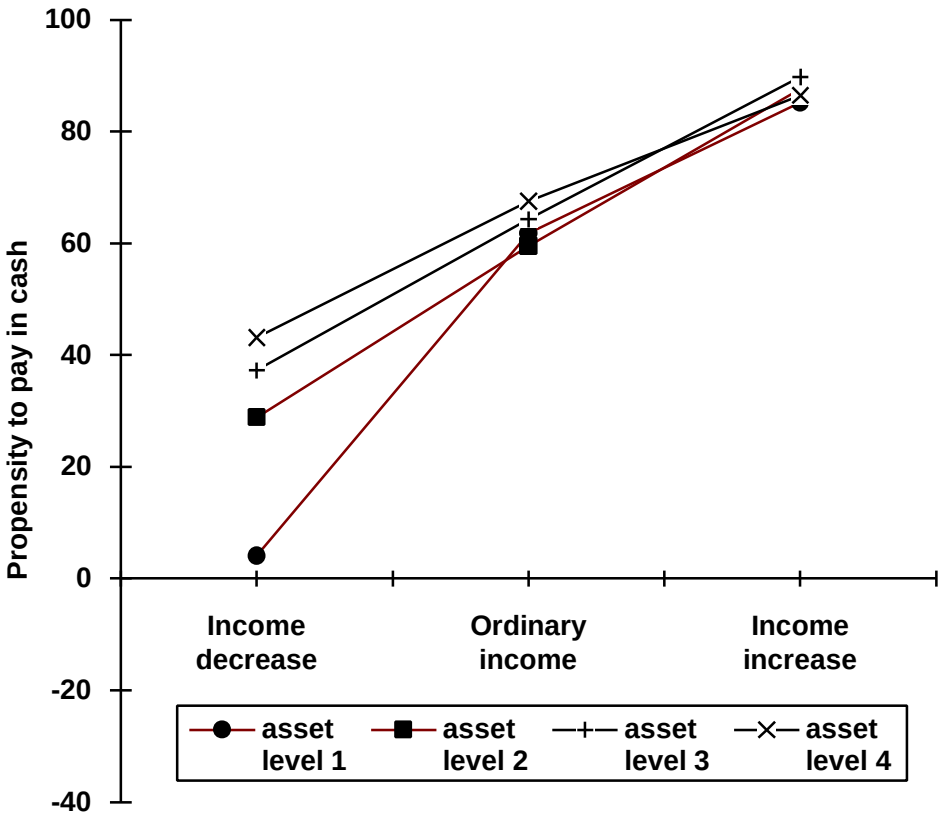

Figure 2. Mean propensity to pay in cash for different income-change conditions and asset levels.

Discussion

The results further validated the impact of mental accounts on specific payment decisions. Subjects were more willing to pay in cash in the income-increase conditions where they could use current income than when they had to use current savings for paying in cash. They were furthermore more willing to pay in cash in the ordinary-income conditions where some current income could be used than in the income-decrease conditions where only current assets had to be used.

The hypothesis that total assets have an effect on the propensity to pay in cash only for the negative event of receiving an income decrease was supported. However, the effect was only observed for the lowest asset level. One possible explanation (suggested above to account for the results of Experiment 1) is that subjects impose a limit on how much they are willing to use of their savings and that they may adjust this limit to the amount of savings they have. If so, the effect of total assets on the propensity to pay in cash after an income decrease will be counteracted.

It was expected that buying to replace something broken when saving to attain a desired goal would lead to a greater propensity to pay in cash

than buying something long desired when saving in order to have a buffer for unforeseen expenses. This was expected on the basis of the results of Experiment 1. The tentative explanation was that the motives for saving and consumption were noncompatible in the latter condition while both noncompatible and compatible in the former condition. The results tended to be in the opposite direction to what was expected. Although nonsignificant, these contradicting results make the interpretation difficult. It is not necessarily false that the saving to attain a desired goal condition induced mixed motives. With mixed saving motives, subjects may perceive the different consumption motives either as compatible or noncompatible, or both. An unambiguous prediction may therefore be difficult to make.

General Discussion

The present study aimed at showing the effect of mental accounts (Shefrin & Thaler, 1988, 1992) on specific economic decisions and to investigate the importance of compatibility between saving and consumption motives and amount of total assets for the willingness to use current savings. According to Shefrin and Thaler (1988, 1992), people impose restrictions on their assets and are more reluctant to use current assets than current income for consumption. This use of mental accounts may serve the purpose of a more general self-control device, with the use of current income for more immediate and current assets for future spending. An important factor enhancing the use of current assets may be the compatibility between the motive held for savings and the motive for consumption. If motives for saving and consumption are compatible, it was expected that the reluctance to use current savings would decrease.

The results of both experiments supported the use of mental accounts in specific payment decisions. Subjects were more prone to pay immediately in cash when a current income was available than when they had to use current savings. This was found when total assets were equal (Experiment 1) as well as when total assets were greater when using current savings (some situations in Experiment 2). In adjustments to temporary income changes, people thus seem to be more concerned about preserving current assets, as when receiving an income decrease, than to increase current assets to the same level when receiving an income increase. It should furthermore be noted that this support for the role of mental accounts in economic decisions is an extension of the results of Shefrin and Thaler (1988, 1992) who only obtained support for the use of mental accounts in subjects' expectations of future consumption from different mental accounts.

In Experiment 1, the expected decrease in reluctance to use current savings when motives for saving and consumption were compatible was partly supported. When the saving motive was to have a buffer, the propensity to use current savings to pay in cash was greater for the

compatible consumption motive to replace something accidentally broken than for the noncompatible motive to buy something desired for a long time. When the saving motive was to be able to buy something desired, there were no differences in the propensity to pay in cash for the compatible and noncompatible consumption motives. It was suggested that the absence of a compatibility effect for the saving to attain a desired goal motive could be due to perceiving this motive as mixed. Hence, even if compatibility effects in mental accounting are partly supported, the results indicated that what is perceived as compatibility between saving and consumption motives may be complex.

In Experiment 2, due to a more comprehensive processing of negative events (Peeters & Czapinski, 1991; Taylor, 1990), it was expected that subjects would only take total assets into account when receiving an income decrease. The results supported this expectation in showing that different asset levels only had an effect on the propensity to pay in cash for an income decrease and not for an ordinary income or an income increase. However, this effect only showed up in a significant difference between the lowest and second lowest asset levels. One possible explanation of this weaker effect of asset level is that subjects impose a limit on how much they are willing to use of their savings and that they adjust this limit to the amount of savings they have. It could also be the case that this weaker increase in propensity to pay in cash with increasing asset levels is due to a diminishing sensitivity to value (Kahneman & Tversky, 1979; Tversky & Kahneman, 1991).

The effects of mental accounts in the present study is in conflict with the assumption in expected utility theory that decisions should be made taking into account total assets (von Neuman & Morgenstern, 1947). It furthermore violates the principle of fungability of money (Thaler, 1985, 1990). Subjects may nevertheless have a rationale for using mental accounts, applying them as a general self-control device. An important question is to what extent these results from a fictitious buying situation are possible to extend to real-life situations. On the one hand, one may expect subjects to be more rational, in the sense of behaving in line with normative theory, when responding to fictitious situations. On the other hand, one may expect that people in real-life situations are influenced by other factors such as temptation and impulsiveness. Such factors may decrease the effectiveness of mental accounts as a self-control device. Hence, the incentives to use mental accounts may be greater in real life but may at the same time be harder to apply. It is reasonable to think that the pronounced use of mental accounts in the present experiments also to some degree extend to real-life situations.

References

Ferber, R. A. (1973). Family decision making and economic behavior. In E. B. Sheldon (Ed.), *Family economic behavior: Problems and prospects* (pp. 29-61). Philadelphia, PA: Lippincott.

Gärling, T., Karlsson, N., Romanus, J. & Selart, M. (In press). Influences of the past on choices of the future. In R. Ranyard, R. Crozier, & Svenson, *Decision making: Models and explanations*. London: Routledge.

Gärling, T., & Romanus, J. (1996). *Integration and segregation of prior outcomes in risky decisions*. Manuscript submitted for publication.

Heath, C. (1995). Escalation and de-escalation of commitment in response to sunk costs: The role of budgeting in mental accounting. *Organizational Behavior and Human Decision Processes, 62*, 38-54.

Henderson, P., & Peterson, P. (1992). Mental accounting and categorization. *Organizational Behavior and Human Decision Processes, 51*, 92-117.

Hirst, D. E., Joyce, J. J., & Schadewald, M. S. (1994). Mental accounting and outcome contiguity in consumer-borrowing decisions. *Organizational Behavior and Human Decision Processes, 58*, 136-152.

Hoch, S. J., & Loewenstein, G. F. (1991). Time-inconsistent preferences and consumer self-control. *Journal of Consumer Research, 17*, 492-507.

Kahneman, D., & Tversky, A. (1979). Prospect theory: an analysis of decision under risk. *Econometrica, 47*, 263-291.

Karlsson, N., Gärling, T., & Selart, M. (1996). *Explanations of effects of prior outcomes on intertemporal choice* . Manuscript submitted for publication.

Katona, G. (1975). *Psychological economics*. New York: Elsevier.

Keynes, J. M. (1936*). The general theory of employment, interest, and money*. London: Macmillan.

Lindqvist, A. (1981). *Hushållens sparande (The saving behavior of households)*. Doctoral dissertation, The Stockholm School of Economics.

Linville, P. W., & Fischer, G. W. (1991). Preferences for separating or combining events. *Journal of Personality and Social Psychology, 60*, 5-23.

Loewenstein, G. (1988). Frames of mind in intertemporal choice. *Management Science, 34*, 200-214.

Peeters, G., & Czapinski, J. (1990). Positive-negative asymmetry in evaluations: The distinction between affective and informational negativity effects. *European Review of Social Psychology*, 1, 33-60.

Ranyard, R. (1995, August). *Mental accounts in financial decision making: a cognitive-psychological analysis*. Paper presented at the 20th IAREP Conference, Bergen, Norway.

Romanus, J., Karlsson, N., & Gärling, T. (in press). Loss sensitivity and concreteness as principles of integration of prior outcomes in risky decisions. *European Journal of Cognitive Psychology*.

Selart, M., Karlsson, N., & Gärling, T. (in press). Self-control and loss aversion in intertemporal choice. *Journal of Socio-Economics*.

Shefrin, H. M., & Thaler, R. H. (1988). The behavioral life-cycle hypothesis. *Economic Inquiry, 26*, 609-643.

Shefrin, H., & Thaler, R. (1992). Mental accounting, saving, and self-control. In G. Loewenstein and J. Elster (Eds.), *Choice over time* (pp. 287-330). New York: Russel Sage Foundation.

Thaler, R. H. (1985). Mental accounting and consumer choice. *Marketing Science, 4*, 199-214.

Thaler, R. H. (1990). Anomalies: Saving, fungability, and mental accounts. *Journal of Economic Perspectives, 4*, 193-205.

Thaler, R. H., & Shefrin, H. M. (1981). An economic theory of self-control. *Journal of Political Economy, 89*, 392-406.

Tversky, A., & Kahneman, D. (1981) The framing of decisions and the psychology of choice. *Science, 211*, 453-458.

Tversky, A., & Kahneman, D. (1991). Loss aversion in riskless choice: A reference-dependent model. *The Quarterly Journal of Economics, 106*, 1039-1061.

Von Neuman, J., & Morgenstern, O. (1947). *Theory of games and economic behavior*. (2nd ed.) Princeton, NJ: Princeton University.

Winett, A., & Lewis, A. (1995). Household accounts, mental accounts, and savings behaviour: Some old economics rediscovered? *Journal of Economic Psychology, 16*, 431-448.

Wärneryd, K.-E.(1989). On the psychology of saving: an essay on economic behavior. *Journal of Economic Psychology, 10*, 515-541.