



The Effects of Prior Spending on Future Spending Decisions: The Role of Acquisition Liabilities and Payments

DILIP SOMAN* and VIVIAN M. W. LAM

mksoman@ust.hk; mkvivian@ust.hk

Hong Kong University of Science and Technology, Clearwater Bay, Kowloon, Hong Kong

Accepted 24 June 2002

Abstract

Research in mental accounting shows that prior spending influences a consumer's decision to make a new spending decision (Heath and Soll 1996, Soman 2001). In particular, greater spending in a particular category reduces the likelihood of further spending in that category. In the present research, we decompose "spending" into two distinct episodes—the *acquisition liability* episode during which a purchase is made accompanied by a commitment to pay (e.g., using a credit card) and the *payment* episode during which the consumer's wealth actually gets depleted (e.g., paying the credit card bill). Using a controlled laboratory experiment and real world data from a group of consumers, we replicate earlier findings that prior spending influences a pending spending decision, but also show that the location of both the acquisition liability episode and the payment episode play a role. Our results contribute to an understanding of the dynamic mental accounting of acquisition liability and actual outflows.

Keywords: mental accounting, dynamic effects, budgeting, acquisition liability, payments, consumption

1. Introduction

Exchanging money for goods and services is one of the most routine activities that consumers engage in. Besides being the bulwark of commerce, this exchange forms the basic building block of a number of fields of study. First, an understanding of the relative costs and benefits of the transaction results in an understanding of its attractiveness and hence and understanding of individuals as economic decision-makers (cf. Kreps 1990). Second, an understanding of the cognitive mechanisms that consumers use to track these costs and benefits results in the study of mental accounting (cf. Thaler 1999). This latter field of study bring together psychological and economic approaches to understand how consumers value outcomes (cf. Kahneman and Tversky 1979), how they code and organize these valuations (cf. Henderson and Peterson 1992; Thaler 1980, 1985) and how they budget and make spending decisions (cf. Heath and Soll 1996; Soman 2001; Thaler and Shefrin 1981).

* Corresponding address: Fuqua School of Business, One Touerview Road, Duke University, Durham, NC 27708.

One robust finding in the domain of mental accounting relates to the effect of prior spending on future spending. Research suggests that consumers set budgets for various spending categories (and indeed for monthly expenses in general, see Zelizer 1994), as a result of which spending in a given category reduces the likelihood of future spending in the same category (Heath and Soll 1996; Soman 2001). Heath and Soll (1996) suggest that consumers proactively set limits, track and deduct expenses from an account and then use the unspent amount in each category as an input into the next spending decision. Soman (2001), however, argues that in addition to the dollar value of the expense, psychological factors like its salience and memorability also influence its impact on future spending. Also, research shows that as temporal separation between the prior spending and the pending decision increases, the prior spending has a smaller impact on the pending decision (Gourville and Soman 1998). Common to all of these streams of research is the underlying finding that recent expenses reduce the likelihood of future spending.

We investigate the effects of past spending on future spending by decomposing spending into two constituents. First, we define the *acquisition liability* episode (referred simply to as *acquisition*) as the act of making a purchase and the associated commitment to pay. Second, we define *payment* as the episode in which the consumer actually completes the transaction resulting in a depletion of his wealth. The distinction between acquisition liability and payment episodes is meaningless for cash-and-carry transactions, and therefore for a large fraction of routine consumer transactions till the recent past. In a cash-and-carry transaction, a consumer gives up cash at the same time as acquiring the product. However, the advent of plastic and electronic payment mechanisms has ushered a need to more closely examine this distinction. For example, a consumer who pays by a charge card incurs an acquisition liability in a store when he presents the card in exchange for the product, but makes a payment only at the end of the month on receiving the monthly statement. Table 1 lists a number of typical payment mechanisms and describes the nature of the delay between the acquisition and the payment episodes. Note that the distinction between acquisitions and payments arises not only as a result of modern payment mechanisms, but exists in the domain of services (e.g., utilities like telephone or gas) where the practice of acquiring and consuming at one point in time and paying later (in response to a bill) is widespread.

The goal of this paper is to answer the following question: In investigating situations where acquisition liability precedes payments, is the effect of prior spending on future spending driven by the acquisition episode or by the payment episode? The rest of this paper is organized into three sections. First we review relevant literature in mental accounting and behavioral decision research. Second, we present the results of one laboratory experiment and one field study that investigate the relative impact of expenses and payments. Third, we conclude with a discussion of the limitations and possible future extensions of our research.

Table 1. The Distinction Between the Acquisition Episode and the Payment Episode for Various Payment Mechanisms

Payment Mechanism Used at the Acquisition Episode	The Payment Episode: When Does Wealth Get Depleted	Delay (the Time Between Acquisition and Payment)
Cash	Immediate depletion	No delay
Debit card	Immediate depletion	No delay
ATM bill payments	Immediate depletion	No delay
Check	After the seller deposits the check and it gets cleared	Short delay
Charge card	At the end of the payment cycle (when consumers employ another payment mechanism to settle the statement)	Moderate delay
Billed services (e.g., utilities)	At the end of the month	Moderate delay
Credit card	Any time starting from the end of the payment cycle, theoretically till infinitely	Moderate to long delay
Stored value cards (e.g., prepaid calling cards or photocopy cards)	Payment has already been made	Negative delay
Advance purchasing	Payment has already been made	Negative delay

Note: In the present research, we only focus on situations in which acquisitions precede payments and the delay is positive. Situations in which payments precede consumption provide an interesting opportunity to study the effects of prepayment on the attractiveness of the consumed product, and have been studied in Gourville and Soman (1998) and Soman and Gourville (2001).

2. The Effect of Prior Spending on Future Spending

Research in mental accounting finds support for a number of interesting effects that are both static and dynamic in nature. In the present paper, we focus on one specific dynamic effect (i.e. an effect in which past decisions by the consumer impact a future decision) of mental accounting—the effect of prior spending on future spending. In their research on mental budgeting, Heath and Soll (1996) proposed that consumers mentally allocate (i.e. budget) their money to a number of spending categories (like food, entertainment and clothing). They track and record cumulative expenditures within each spending category, and their purchase behavior at any time is driven by the money available in each category (Heath and Soll 1996; Heath 1995). Therefore, the likelihood of incurring a given expense is inversely related to the size of prior spending in that particular category.

Heath and Soll's (1996) representation of the budgeting process is a relatively mechanical one in which consumers monitor expenses and are aware of the unspent (i.e. available) amounts at any given point in time. At the end of the budgeting period, accounts are replenished and the process continues in a cyclical manner. Noting that this model is a good approximation of behavior but not a good descriptor of process, Soman (2001) argued that consumers practice a more intuitive form of accounting called retrospective accounting. When faced with a purchase opportunity, a consumer might ask himself how much he has

spent on similar products in the recent past and form a mental representation of the level of this past spending. This mental representation drives future spending decisions, and has been referred to variously as the “aversive impact or behavioral impact of payment” (Gourville and Soman 1998; Soman 2001) or the “pain of payment” (Prelec and Loewenstein 1998). We will use the term “aversive impact” to describe the mental representation of the past spending. More generally, we would expect this aversive impact to have both cognitive and affective antecedents. The cognitive antecedents has to do with the economic valuation and the memory of the expense, the affective antecedent has to do with the pain and the agony experienced on parting with money (Zellermayer 1996).

The aversive impact depends not only on the dollar value of the previous expense, but also on the timing and format of the expense. Soman (2001) argues that payment mechanisms in which the consumer can mentally rehearse the amount paid (e.g., a check where he is required to write the final amount, or a cash transaction in which the right amount has to be counted and change accepted) have a greater impact than payment mechanisms involving no rehearsal (e.g., a credit card payment where the consumer simply signs a receipt). Further, Soman (2001) also showed that the impact was lower for what he called “in process payments,” which he defined as situations in which “an expense had been incurred but the consumer’s wealth had not yet been depleted” (p. 462). And finally, Gourville and Soman’s (1998) results show that the aversive impact of payment depreciates as more time elapses from the time of payment.

In the present research, we build upon Soman’s (2001) notion of in-process payments and make a distinction between two episodes—the *acquisition (liability)* episode when the consumer acquires a product and commits to pay and the *payment* episode when the transaction is completed. In the language of cost accounting (cf. Horngren and Harrison 1989), the acquisition episode results in a credit to a liability account (the accounts payable) while the payment episode results in a credit to an asset account (cash). To a cost accountant reviewing a balance sheet, the impact of both these entries will typically be identical. However, what about a consumer who views an intuitive version of these accounting entries? Will the acquisition liability impact future spending or will the payment impact future spending? In particular, this paper is concerned with the effect of the relative *timing* of the acquisition and payment.

A priori, we expect both the acquisition liability and payment episodes to have an effect, but we expect the payment to have a greater effect. Both episodes provide relevant information to the decision-maker about prior spending. The acquisition episode activates the appropriate mental account that needs to be used. The payment episode activates the pain of parting with money and results in a salient change to wealth levels. It may also serve to remind the consumer about an expenditure that might have otherwise been forgotten. On many occasions, the payment episode might represent the only opportunity for the consumer to receive a complete and accurate report on the size of the acquisition liability. Consistent with this idea is our finding from a short survey in which 84% of a sample of 76 single wage earners reported that they were curious to open their credit card statements and long distance phone bills to “find out how much [they] had spent during the past month.” Interestingly, these individuals were using these statements to learn about their own past behaviors.

Our goal in the present research is twofold. First, we seek to replicate earlier findings that prior spending influences current spending decisions. Second, we attempt to understand which of the two components of spending—acquisition liability or payments—drives of the aversive impact of the prior spending. We achieve these objectives using two studies—one controlled laboratory experiment and one field study. Both studies were based on purchasing situations in which acquisition liabilities accrued over a certain period of time and payments were made at a later point in time.

3. Study 1

The first study was an experimental task in which subjects experienced a simulated set of acquisitions and payments ostensibly spread over a month, but compressed into a one-hour experimental task in the lab. This procedure was used by Soman (2001) who showed that a time compressed methodology allowed the researcher to isolate the effects of the form and timing of the payments after controlling for salience arising due to the nature of the purchase occasion itself. In this methodology, the mechanics of the payment mechanism are preserved. The payment history differed in the relative temporal location of the payments and acquisition episodes, and we wanted evaluate the effect of the temporal location on further spending decisions.

3.1. Subjects, Design and Procedure

One hundred undergraduate students at a large business school in Hong Kong participated as subjects in this experiment in exchange for course credit. All subjects were told to imagine that they had recently graduated and now had a job with a monthly salary of HK\$ 12,000 (1 HK\$ = 0.13 US\$). They were also given a financial profile and told that their bank issued them a charge card to which they charged their expenses. They were further told that they would receive a charge card statement once every month and that they needed to pay for it in full by writing a check.

Subjects then received a booklet entitled “The Average Month” in which they were presented with events from each day of a particular month. Events for a given day were presented on half a sheet, and included—among other details designed to serve as “markers of time”—expenses they incurred. All subjects incurred the same set of expenses (please see Table 2 for a complete list), but differed in the temporal location of the acquisition of these expenses. Subjects were asked to go through the booklet one page at a time and undergo the mechanics associated with incurring any expense and making any payments. Specifically, they were instructed to review the charge card receipts and sign as they would in the real world, and also to write and sign any checks just as they would in the real world. Copies of credit card receipts specifying the acquisition expense and amount, and blank checks were provided to subjects. They could spend as much time as they wanted on each page but could not return to a page after completing it. For subjects in the *early acquisition* condition, these acquisition expenses occurred primarily in the first half of the month while for subjects in the *late acquisition* conditions; these acquisition expenses occurred in the second half of the month. All the test expenses were charged to their charge card. Finally,

Table 2. List of Test Expenses and Manipulation of Acquisition Location: Study 1

Day of Month	Early Acquisitions Condition		Late Acquisitions Condition	
	Acquisition	Amount (HK\$)	Acquisition	Amount (HK\$)
1	Wallet	202		
2	PC games	350		
3	Dinner	450	Electricity bill	800
4	Movie tickets	105		
5	Digital tapes	300	Groceries	202
6	Groceries	200		
7	Clothes	800		
8	Concert tickets	500		
9	Gas and oil change	250	Gas bill	200
10	Mobile phone	100		
11	Football tickets	200		
12	Pizza delivery	150	Groceries	210
13	Groceries	200	Distilled water	250
14	Music CD's	350		
15	Dinner	400		
16			Wallet	202
17			PC games	350
18	Electricity bill	800	Dinner	450
19			Movie tickets	105
20	Groceries	202	Digital tapes	300
21			Groceries	200
22			Clothes	800
23			Concert tickets	500
24	Gas bill	200	Gas and oil change	250
25			Mobile phone	100
26			Football tickets	200
27	Groceries	210	Pizza delivery	150
28	Distilled water	250	Groceries	200
29			Music CD's	350
30			Dinner	400

on one day in the month they received a charge card statement of HK\$ 6200 (ostensibly for acquisition liabilities incurred in a previous month) and were asked to pay for it by writing a check. While the amount of the charge card bill was constant for all subjects, its temporal location differed across conditions. In the *early payment* condition, the statement and the check appeared on the third day of the month, while in the *late payment* condition, these materials appeared on the 27th day of the month. Hence, while all booklets contained the same information, they differed in terms of temporal arrangement of the acquisitions and payments according to a 2 (*Acquisition*: Early or Late) \times 2 (*Payment*: Early or Late) between-subjects design. The expense information on each page was embedded with other information ostensibly relevant to the cover story. We added this other information as we wanted to ensure that there was not a significant difference between the time spend on days which had no acquisitions relative to days that had acquisitions. Note that the timing of the acquisition liability corresponds to the timing of past expenses as studied by prior literature (e.g., Soman 2001).

After completing this task, all subjects were told that it was the last day of the month and received a questionnaire which had two sets of dependent variables embedded in a set of distracter questions. The propensity to spend (PS) was measured by presenting subjects with a scenario in which they were asked to imagine that they were at a mall to make other purchases when they “notice a boxed set of CD’s by an artist you like. It appears to be a good collection and is on sale for a price of \$450 (the normal price would be \$650). You know you don’t badly want the CD’s, but they will be a nice addition to your CD collection and they are especially attractive with the discount.” They were asked: Keeping in mind the expenses that you have already incurred this month, do you think you would buy the CD set? (1 = Definitely will not buy, 9 = Definitely will buy)—we will refer to their response as PS. Subjects were then asked to rate their agreement with 5 statements designed to assess the potential aversive impact of the prior spending (1 = Disagree, 9 = Agree). In responding to this question, subjects were instructed to “think about the expenses that were presented to you prior to the opportunity to purchase the CD’s. Specifically, you should not consider the CD’s—but only consider prior expenses that have already been incurred—in responding to this question.” The five statements were: (a) I think that [my expenses] were much higher than [others in my peer group], (b) I have spend a lot of money on frivolous and unnecessary items, (c) I should be saving more of my monthly salary than I did, (d) The expenses represent a lavish and extravagant lifestyle, and (e) If I continue to spend and save as I did in (the presented month), I will be a wealthy person soon (R). Agreement responses to these 5 scales were highly correlated (Cronbach Alpha = 0.97), and hence we used their average as an indicator of the impact of the past payment. We will refer to this measure as IMPACT.

3.2. Analysis and Results

The PS and IMPACT scores were analyzed using a 2 (*Acquisition*) \times 2 (*Payment*) ANOVA. Results for both dependent variables revealed a similar pattern of results and are hence reported jointly. There was a strong and significant main effect of *Payment* (for PS: $F_{1,96} = 20.87$, $p < 0.001$, for IMPACT: $F_{1,96} = 22.05$, $p < 0.001$). The main effect of *Acquisition* was significant for PS ($F_{1,96} = 8.45$, $p < 0.01$) but did not approach significance for IMPACT ($F_{1,96} = 3.17$, $p = 0.078$). Finally, the two-way interaction of *Acquisition* and *Payment* was not significant for both dependent variables (both p ’s > 0.8).

Although we had instructed subjects to respond to the IMPACT questions only on the basis of expenses incurred prior to the CD purchase opportunity, we wanted to test to see whether their decision to purchase the CD or not influenced their response. Therefore, in addition to the ANOVA reported above, we also ran two 2 (*Acquisition*) \times 2 (*Payment*) \times 2 (*CD Purchase*) ANOVAs. In one of the ANOVAs, the *CD Purchase* variable was obtained by performing a median split on their response to PS. In the other ANOVA, the *CD Purchase* was assigned a level of “Low” if PS was 5 or less, and it was assigned a level of “High” if PS was greater than 5. Across both ANOVAs, there was neither a significant main effect of *CD Purchase*, nor any interactions involving *CD Purchase* (all p ’s > 0.25); however the pattern on results described above was replicated. Hence, we were satis-

fied that subjects did adhere to the instructions and that their response to the question on whether they would purchase the CD player did not influence their response to the IMPACT questions.

Consistent with the research of Heath and Soll (1996) and Soman (2001), the significant main effect of *Acquisition* suggests that the more recently the prior acquisition liability was incurred, the greater an effect it would have on the pending spending decision and hence the lower the propensity to spend ($PS_{\text{early acquisition}} = 5.32$, $PS_{\text{late acquisition}} = 4.34$). Directionally, our results are also consistent with this logic for the effect of the location of the prior acquisitions on their perceived IMPACT. Specifically, the more recent acquisitions would have a larger impact than acquisitions incurred in the past ($IMPACT_{\text{early acquisition}} = 5.39$, $PS_{\text{late acquisition}} = 5.96$).

As expected, however, the location of the payment also played a role in influencing both the propensity to spend as well as the aversive impact. Specifically, the more recently a payment was made, the more likely was it to reduce spending ($PS_{\text{early payment}} = 5.60$, $PS_{\text{late payment}} = 4.06$) and to increase the perceived IMPACT ($IMPACT_{\text{early payment}} = 4.92$, $PS_{\text{late payment}} = 6.42$). Note that these effects are independent of the actual location of the acquisitions.

3.3. Discussion

While the results of Study 1 replicate prior research showing that previous spending influences future spending behavior, it went one step further in decomposing the effects of the previous spending into the effects of acquisition liability and the effects of payment. We find that in addition to the acquisition episode, the location of the payment causes a large perceived impact of the spending and also causes a reduction in the propensity to spend in the time zone following the payment. Consistent with Soman's (2001) speculation, the act of payment seemed to make the consumer "relieve the aversive impact of the past payment and hence experience a temporary reluctance to spend" (p. 473).

One implication of this finding is the possibility that a payment for consumption in the distant past may influence spending behavior even in situations where no spending has occurred in the recent past. Conversely, it is possible that spending does not get controlled even when there are a large number of acquisition expenses that have been recently incurred because a payment has not been made in the recent past. We investigate these possibilities in the next study.

4. Study 2

Unlike Study 1, the present study is a field study in which we recorded acquisition liability and payment information from a group of respondents in a given spending category. In particular, we studied long distance calling activity as a function of recent calling activity and payment. In the terminology of this paper, we would refer to each phonecall as an acquisition liability.

4.1. *Participants and Data*

Participants in this study were drawn from members of the academic community (staff and post-doctoral researchers) at a large state university in Colorado. Signs were posted on campus bulletin boards to solicit volunteers for a study on long distance calling plans and satisfaction with phone service providers. Those that responded to the request to help were requested to fill out a screening questionnaire. In recruiting suitable participants for the study, we were looking for consumers who (a) were solely responsible for making and paying for their long distance calls, (b) who had a substantial level of calling activity, and (c) who were on identical, flat calling plans (i.e. the per minute charge was the same for any call within the U.S.). Specifically, we wanted consumers for whom the decision variable—i.e. the decision to call and the time spend on the phone—correlates with the size of the expense. Given this requirement, we decided to eliminate consumers who made international calls.

Based on these restrictive criteria, we recruited 33 residents in the Denver–Boulder area to participate in this study. Each participant provided us with the following information: (a) two months of long distance calling activity reported from their monthly bills (details included date and dollar expense), (b) a date on which the monthly statement was received (this was checked against the postmark date on the envelope for consistency), and (c) the data and amount of the check that was made. The amount of the payment did not necessarily correspond to the total of the expenses incurred in the most recent period for two reasons—first, due to logistical reasons, it was not possible for a monthly statement to include items upto the date of the statement and there was typically a lag of about one week. Second, the final bill paid also included discounts and service fees (the size of which were roughly constant over all respondents).

In the light of our own definition of payments and acquisitions, the payment episode in this case admittedly occurs only after the check is deposited and cleared (see Table 1). However, for the purpose of our data, we were limited to information about when the check was actually written and sent out. Given the large temporal spreads between the acquisitions and payment, we felt that this imprecision in the data would not matter significantly. All participants came from single size households and spent between \$80 and \$115 on long distance calling.

For each participant, we had a time series of observations that corresponded to the dollar value of the long distance phone calls on any given day, and a (negative) value of the payment. We consider the date on which the check was written and mailed as the payment episode. One could argue that the date on which the monthly bill was received could also serve as the payment episode as it performs some of the hypothesized functions of payment (e.g., reminding and organizing). Fortunately, in our dataset, all of our respondents wrote checks within 2 or 3 days of receiving the bill. Robustness checks show that the results we report here hold even if we treat the receipt of the bill (or any date in between) as the payment episode.

4.2. Results and Discussion

Our goal in the analysis was to explain the day to day fluctuations in calling activity as a function of recent acquisitions and payments. We estimated the following model: $\Delta\text{CALL}_t = \alpha + \beta_1 \cdot \text{AL}_{\text{Days } t-1 \text{ to } t-3} + \beta_2 \cdot \text{AL}_{\text{Days } t-4 \text{ to } t-6} + \beta_3 \cdot \text{PAYDOLL} + \beta_4 \cdot \text{PAY}_t$.

The dependent and independent variables in this model are described below:

ΔCALL_t	The dependent variable represents the day to day fluctuation in long distance calling expenditures. On looking at time series plots of individual respondents' expenses, we notice that calling activity is "sticky." Specifically, fluctuations between high and low calling periods typically occur in intervals of a few days rather than on a day to day basis. As a result, a model using the actual dollar acquisition on any given day as the dependent variable will yield a positive coefficient for recent calling activity (i.e. the more I call in the recent past, the more will I spend today). To correct for this spurious coefficient, we adjusted the dependent variable as the actual dollar acquisition on a given day minus the average spending in a five-day period centered on that day. ¹ As a result, the dependent variable was now capturing a fluctuation of a given day's acquisition from the local "trend." An alternate way of analyzing would have been to use the actual acquisition as the dependent variable and to include a 5-day average as a covariate. This second approach results in the same pattern of results as we report here.
$\text{AL}_{\text{Days } t-1 \text{ to } t-3}$	This is the sum of acquisition liability (of long distance calls) incurred in the most recent three days preceding t . The pattern of results was not sensitive to whether we looked at a one-day, two-day or three-day window (or even upto a five-day window). In keeping with our discussion on "sticky" calling activity, we used a three-day window.
$\text{AL}_{\text{Days } t-4 \text{ to } t-6}$	This is the sum of acquisition liability in a three-day window preceding the first three day window. In preliminary analysis, we went back for four periods and found that there are typically no significant effects after the first two periods, so we restrict ourselves to two periods for the present analysis.
PAYDOLL	The dollar amount of the most recent payment.
PAY_t	The number of days elapsed from the date of the last payment.

Note that our dataset was cross sectional (i.e. had a number of respondents) and a time series. We could estimate either a fixed effects model (using OLS) or a random effects model (using GLS). The fixed effects model is consistent with the idea that individual effects are constant while the random effects model suggests that these effects may be randomly distributed and change over time (Fuller and Battese 1974; Greene 1997). The

Hausman test for random effects was insignificant ($p > 0.80$), suggesting that a random effects model would be a more appropriate one to use for our data (Greene 1997). Hence we used the cross-sectional random effects model, which were fitted to a time series of length 47 using GLS estimation.

Results yielded a significant negative coefficient of $AL_{\text{Days } t-1 \text{ to } t-3}$ ($\alpha = -0.2062$, $p < 0.001$) and a significant positive coefficient of PAY_t ($\alpha = 0.0269$, $p < 0.01$). The coefficients of $AL_{\text{Days } t-4 \text{ to } t-6}$ ($\alpha = 0.0304$, $p = 0.37$) and $PAYDOLL$ ($\alpha = 0.001$, $p = 0.66$) were not significant.² Consistent with our expectation, the decision to incur an expense on a given day (adjusted by the “local average”) depended on two factors—(a) the amount of recent acquisition liability and (b) the temporal distance from the most recent payment. Specifically, the greater the amount of recent acquisition liability, the less the tendency to call in the present period. And the more recently a payment had been made, the less the tendency to call in the present period.

Across several runs of the analysis, we find that acquisition liability in only the most recent time period immediately preceding a given day influence current spending, but not acquisitions incurred in the distant past. In the presented model, for example, the coefficient of $AL_{\text{Days } t-4 \text{ to } t-6}$ is not significant. This result is consistent with the idea that expenses depreciate over time (Gourville and Soman 1998). Interestingly, we also find that the dollar amount of the payment does not influence current expense. There are two possible explanations for why this is the case. First, it is likely that the dollar value indeed has no effect if it is greater than a certain threshold. This is possible given that one of the main ways in which payment influences further spending is by reminding consumers about the prior liability and getting them to relieve the associated pain. Second, the lack of an effect could simply be the artifact of our dataset in which the variance in the bill amounts was not very large (bills ranged between \$80 and \$115). Based on the available data, we are unable to identify which of these two explanations drives the non-significant coefficient.

The results from this field study allowed us to validate the results from Study 1 and to show that both the acquisition and payment episodes influence future spending decisions.

5. General Discussion and Conclusion

5.1. Summary of Results

Our goal in the present research was to replicate and extend previous research which argued that prior spending influences pending spending decisions (Heath and Soll 1996; Soman 2001). We wanted to decompose the prior spending into two distinct episodes, the acquisition episode and the payment episode, and to demonstrate that both episodes influence the pending spending decision. Finally, we wanted to investigate these ideas both in controlled laboratory settings (as the past research in this area has done) and using real data from the field.

In Study 1, we manipulated the location of past acquisitions as well as payments and found that both acquisitions and payments that occur in the recent past influence pending spending decisions more significantly than acquisitions and payments that occur significantly in the past. In Study 2, we looked at a time series of long distance calling expenses

and payments for a panel of 33 consumers and find that the expense on any given day is a function of the most recent acquisitions and the time from the most recent payment. Across the two studies, we were able to achieve our goals of replication and of decomposing the prior spending effects into the effects of acquisition liabilities and payments.

5.2. *Limitations and Future Extensions*

While our studies served their intended goals of replication and of identifying the effects of acquisition and payment episodes, they suffered from limitations. We discuss some of these limitations next, discuss additional issues and also discuss avenues for future research that could give greater insights into the phenomena described here.

First, our studies investigated the effects of the temporal location of acquisition liabilities and payments but did not study the effect of size. In Study 1, we simply manipulated the location (not size) of acquisitions and payments, while in Study 2 we did not find any significant effect of the dollar amount of payments, possibly due to the fact that its variation was low. Should the payment size matter in influencing pending spending decisions? We argued that the payment episode matters because it reminds consumers about the past acquisition liabilities and consumption, and it causes them to “relive” the associated pain (in addition, it also causes an income effect, see following discussion). A greater dollar amount would certainly increase the pain, but it is not clear if the dollar size plays any differential role in reminding. As a result, one possibility is that there is a certain threshold dollar amount of payment above which the effects of payment are insensitive to the dollar amount. Of course, this is only a speculation and future research could attempt to validate this or other possible effects of dollar size.

Second, we dwell further on the effects of acquisitions and payments. An economist’s view of the world might argue that only payments, in fact should matter because that is the episode in which the consumer’s wealth actually gets depleted. This creates an income effect that causes the temporary reluctance to spend. A mental accounting view, on the contrary, may argue that acquisitions are booked and posted at the time they are incurred. The consumer should have fully expected to make that payment well before the payment actually occurs, and hence the payment episode should provide no new information to the decision-maker. Our goal was not to pit one view against the other, but simply to explore the relative impact of the two episodes. However, we would like to comment on the role of the income effect in our studies. While we theoretically agree with the position that the payment episode might cause an income effect that causes a reluctance to spend, we feel that this position is practically not a valid one. Given the size of the payments relative to a consumer’s wealth, the size of the resulting effect should be very small. Additionally, income effects should be durable, while the effects of payment seem to depreciate over time, suggesting that they are psychological in addition to being economic in nature.

One extension of the present research would be to study situations in which the economic effects of the payment are isolated from the psychological effects. For instance, consider a situation in which acquisitions are charged to a debit card, but the card issuer sends a monthly statement just listing all the acquisitions incurred in the previous month. Here,

payment occurs at the same time as the acquisition but the monthly statement could serve as a reminder and to relieve the pain of the payment.

Third, we established the effects of acquisition liabilities and payment in two separate types of mental accounts—a “broad” mental account which simply spanned all expenses in a given month, and a “narrow” mental account spanning only long distance calling expenses. One avenue for future research is to investigate the similarity between the nature of the payment and its relevance to the pending expense. For example, will a large telephone bill influence only calling behavior, or might it temporarily reduce the propensity to spend on other discretionary items? Another issue relates to the comparison of credit card bills (which aggregate payments from a large number of spending categories) with telephone bills (which presents expenses from only one spending category) and their relative effects on different spending categories.

Fourth, we did not manipulate and theorize about the length of delay between acquisition and payment, and its role in the relative impact of the two episodes. We speculate that the payment episode might play a larger role as delay initially increases, but beyond a certain point the payment and acquisitions could get decoupled (i.e. psychologically dissociated from each other; Gourville and Soman 1998) and hence the payment episode might lose relevance.

Fifth, in both our studies, we used situations in which there were several distinct acquisition episodes (e.g., expenses, or phonecalls) but only one aggregated payment episode (e.g., credit card bill, phone bill). While such situations are very common in the real world, it would be theoretically interesting to investigate two other situations that also occur frequently. First, consider situations in which a single product is purchased, but its acquisition may significantly precede its payment. An example might be a “buy-now-pay-later” scheme in which a consumer pays for a product a month after purchasing it. Second, consider situations in which there is one acquisition, but multiple payment episodes. An example might be an installment purchase scheme for a household durable in which the consumer acquires a product and then makes multiple payments over a period of time. Studying the effects of acquisition and payment in these situations will help paint a more complete picture of the effects of past expenses on future spending.

In conclusion, there is much research that needs to be done in getting a richer understanding of the dynamics of how consumer spending is influenced by prior spending. Our goal in the present research was to demonstrate the relationship in both a controlled and a more natural setting, and to highlight the differences between acquisition liability and payment. We hope these findings are provocative enough to warrant a deeper investigation into an understanding of dynamic mental accounting issues.

Notes

1. We thank colleagues in statistics and econometrics for discussion and suggesting this correction.
2. We ran a series of diagnostic checks for normality, linearity and constant variance. In addition, we found no influential observation and no undue effects from multicollinearity.

References

- Fuller, W. A., and G. Battese. (1974). "Estimation of Linear Models with Crossed-Error Structure," *Journal of Econometrics*, 2, 67–78.
- Gourville, John T., and Dilip Soman. (1998). "Payment Depreciation: The Behavioral Effects of Temporally Separating Payments from Consumption," *Journal of Consumer Research*, 25(2), 160–174.
- Greene, William H. (1997). *Econometric Analysis*. Upper Saddle River, NJ: Prentice Hall.
- Heath, Chip. (1995). "Escalation and De-escalation of Commitment in Response to Sunk Costs: The Role of Budgeting in Mental Accounting," *Organizational Behavior & Human Decision Processes*, 62(1), 38–54.
- Heath, Chip, and Jack Soll. (1996). "Mental Budgeting and Consumer Decisions," *Journal of Consumer Research*, 23(1), 40–52.
- Henderson, Pamela W., and Robert A. Peterson. (1992). "Mental Accounting and Categorization," *Organizational Behavioral and Human Decision Processes*, 51(February), 92–117.
- Horngren, Charles T., and Walter T. Harrison. (1989). *Accounting*. Englewood Cliffs, NJ: Prentice Hall.
- Kahneman, Daniel, and Amos Tversky. (1979). "Prospect Theory: An Analysis of Decision under Risk," *Econometrica*, 47(March), 263–291.
- Kreps, David M. (1990). *A Course in Microeconomic Theory*. Princeton, NJ: Princeton University Press.
- Prelec, Drazen, and George Loewenstein. (1998). "The Red and the Black: Mental Accounting of Savings and Debt," *Marketing Science*, 17(1), 4–28.
- Soman, Dilip. (2001). "Effects of Payment Mechanism on Spending Behavior: The Role of Rehearsal and Immediacy of Payments," *Journal of Consumer Research*, 27(4), 460–474.
- Thaler, Richard. (1980). "Toward a Positive Theory of Consumer Choice," *Journal of Economic Behavior and Organization*, 1, 39–60.
- Thaler, Richard. (1985). "Mental Accounting and Consumer Choice," *Marketing Science*, 4, 199–214.
- Thaler, Richard. (1999). "Mental Accounting Matters," *Journal of Behavioral Decision Making*, 12(3), 183–206.
- Thaler, Richard, and Hersh M. Shefrin. (1981). "An Economic Theory of Self-Control," *Journal of Political Economy*, 89, 392–406.
- Zelizer, Viviana. (1994). *The Social Meaning of Money: Pin Money, Paychecks, Poor Relief, and Other Currents*. New York: Basic Books.
- Zellermayer, Ofer. (1996). "The Pain of Paying," Ph.D. Dissertation, Carnegie Mellon University.