



# Always Leave Home Without It: A Further Investigation of the Credit-Card Effect on Willingness to Pay

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## **Abstract**

In studies involving genuine transactions of potentially high value we show that willingness-to-pay can be increased when customers are instructed to use a credit card rather than cash. The effect may be large (up to 100%) and it appears unlikely that it arises due solely to liquidity constraints. In addition to demonstrating the effect, we provide a methodology for detecting it, and our findings suggest a source of variance to test alternative explanations.

**Key words:** credit cards, overspending, mental accounting

## **1. Introduction**

Since the 1970's there has been growing evidence supporting the frequently heard conjecture that credit cards encourage spending. For example, it is known that people who own more credit cards make larger purchases per department store visit (Hirschman 1979), and that restaurant tips are larger when payment is by card (Feinberg 1986). There is also evidence that credit card users are more likely to underestimate or forget the amount spent on recent purchases (Soman 1999). Perhaps the most compelling evidence, however, is that offered in an experimental analysis of the effect by Feinberg (1986). In that investigation participants were asked how much they would be willing to spend for various consumer products in a setting where credit card paraphernalia—ostensibly unrelated to the task—were displayed on the experimental desk. He found that by so decorating the experimental setting, he could boost hypothetical willingness-to-pay estimates by 50–200%, relative to the estimates of a control group. We refer to this increase as the *credit card premium*. Feinberg also found that response times were substantially shorter in the presence of the credit card stimuli. In a similar vein, Soman (1999) demonstrated that framing hypothetical purchases as credit card payments may significantly increase purchase likelihood and willingness to pay.

While these studies offer suggestive evidence supporting a credit-card premium, this evidence is indirect, and the causal mechanism that produced these results has been left uncertain. For example, field evidence in support of higher spending with credit cards (such as Hirschman 1979), could naturally be explained by differences between credit card

owners and non-owners, or differences in the occasions on which cash and credit cards are the preferred methods of payment. While Feinberg's and Soman's results are free of this confound, the generality of their findings is also limited, but by different factors. For example, only one of these studies (Feinberg, Study 3) involved real money transactions; charitable donations to the United Way. Although the presence of credit card logos in the study did increase donation size, the absolute amounts were small (average donations were 11¢ and 33¢ for the cash and credit card conditions). Second, Feinberg's studies only manipulated exposure to credit card stimuli and not the payment method itself. Payment was left ambiguous in the perceived value studies, while the United Way study requested donations in cash.

## 2. Purpose of Study

This empirical note presents new evidence supporting the proposition that consumers are willing to spend more for a product when using a credit card (in at least some purchase contexts). We extend Feinberg's and Soman's experiments in two separate studies. In the first study, we manipulate the payment method, while using real-money transactions. Recall that only one of the previous studies used real money transactions and in that study the payment method was not manipulated (all respondents paid in cash). Furthermore, we use desirable goods of potentially high value. This allows us to investigate whether the Feinberg result is limited to transactions of very small magnitude or whether it also extends to transactions involving much larger amounts. In the second study we further explore the necessary and sufficient conditions that support the effect. In particular, we separately manipulated payment method and exposure to a credit card logo to investigate which of these factors stimulate purchasing. Moreover, we investigate whether the effect only arises when the market price of the product is uncertain. In the second study we use a product for which the market price is known.

Our results reveal a potentially large credit card premium, but the effect is not always present. In the first study, which uses goods with uncertain market value, we observe a large premium (more than 100%). However, in the second study, using a good with a known market value (a restaurant gift certificate) the premium does not always arise.

## 3. Study 1

### 3.1. Prizes

The first study was designed to elicit willingness-to-pay for tickets to sporting events. Two pairs of tickets were separately auctioned off. One pair of tickets was for the last regular-season game, between the Boston Celtics and the Miami Heat. The Celtics needed this win to clinch the division title, and, like all Celtics games at the time, was sold-out well in advance. The game was played on a Sunday afternoon, three days after the Thursday auction. The other pair of tickets was to a regular season baseball game, between the Red

Sox and the Toronto Blue Jays. There was also a consolation prize of a pair of banners (one featuring the Celtics and one featuring the Red Sox). We did not provide information about the market values of any of the three prizes. The specific descriptions were:

- (1) One pair of 3rd row balcony tickets for Celtics-Miami game, Sunday April 19, 1PM, at the Boston Garden.
- (2) One pair of bleacher tickets for Red Sox-Toronto game, Sunday April 19, 1PM, at Fenway Park.
- (3) Consolation prize of one Celtics and one Red Sox banner.

### 3.2. Respondents and General Procedure

The respondents were MBA students, who responded to a poster promising a \$2 bill and an opportunity to purchase Celtics tickets. The experiment was held during lunchtime in a classroom. Upon entering the room, students were handed an instruction sheet that described the prizes, the rules for allocating the tickets, and a sheet for indicating their reservation values. They were instructed not to discuss their answers or anything else about the questionnaire. Respondents handed in their completed sheets as they left the room. They were told that the winners would be announced at 5PM that afternoon.

We elicited reservation values using a second-price sealed-bid auction. In this procedure, the prize is given to the person who writes down the highest value; however, the prize is sold at a price equal to the *second highest* stated value. Under these rules, participants have no reason to either overestimate or underestimate their true maximum willingness-to-pay (i.e., it is an “incentive-compatible” elicitation mechanism; Vickrey 1961).

Respondents wrote down their reservation values for all three prizes. If the same person wrote down the highest value for more than one prize, they would only win the prize that they valued the most.

### 3.3. The Cash vs. Credit Card Manipulation

Unbeknownst to the respondents, two different types of elicitation sheets were handed out, in a random fashion. The first, *cash condition* sheet, stipulated that payment was required from winners in cash. Respondents in this condition were also asked to indicate whether they had “ready access to a local cash-machine.” The second, *credit card condition* sheet, stipulated that payment was to be made by credit card. Respondents in this condition were asked to identify the type of card that would be used to purchase the prizes (VISA, Amex, or MasterCard), its expiration date, and to write down the last three digits of the credit card number.

Respondents in both conditions were told that they would have to make the payment by 5PM the next day. In a slight deception, we planned to sell the tickets to the winners at no more than their face value, and would accept payment by check in either condition.

### 3.4. Results

We found that respondents in the credit card condition wrote down significantly higher values for all three prizes (Table 1). The credit card premium was highest for the Celtics tickets, and smallest for the banners (although these differences were not statistically significant). All three premia, and the premium for the Celtics tickets in particular, were more substantial than could be justified by the financial benefits of credit cards.

## 4. Study 2

In the first study, respondents required to pay by credit card offered higher bids on average than their counterparts in the cash condition. In the second study we investigate the necessary and sufficient conditions that support this effect by varying the study in two ways. First, we measure willingness to pay for a product for which the market price is certain. Recall that in the first condition we measured willingness to pay for tickets to a sold-out sporting event, for which the value was unstated. In this second study we measure willingness to pay for a gift certificate of a stated value. This allows us to evaluate whether the credit card premium arises because customers adjust their valuations from different anchoring points in the cash and credit card conditions. For example, in the cash condition respondents may anchor their valuations using the amount of cash that they typically carry in their wallets. In the credit card condition they may anchor on their credit limit or the size of their monthly bill. If this is true we would expect the effect to be reduced if the stated value of the gift certificate provides a common anchor for valuation.

The second study also varies from the first study due to the separate manipulation of payment methods and exposure to credit card logos. Feinberg's results indicate that varying exposure to a credit card logo is sufficient to effect willingness to pay. This suggests an association bias in which respondents have positive associations for credit cards that inflate their willingness to pay regardless of the actual payment method. If the credit card premium is due to this effect alone, we would not expect a large effect when varying payment method without varying exposure to the logo. However, varying exposure to the logo, while holding payment method constant should be sufficient to produce the effect.

Table 1. Study 1: Mean values for Celtics tickets, Red Sox tickets, and Banners, by payment method

	Celtics	Red Sox	Banners
Cash mean (N = 31)	\$28.51	\$9.02	\$3.32
(std err)	(3.25)	(1.10)	(1.61)
Credit card mean (N = 33)	\$60.64	\$15.92	\$5.29
(std err)	(11.09)	(2.66)	(1.66)
Credit card premium	+ 113%	+ 76%	+ 59%
t-test	t = 2.71, p < .01	t = 2.35, p < .05	t = .85, ns
Cash median	\$25.00	\$8.00	\$1.00
Credit card median	\$41.00	\$12.00	\$2.00
Wilcoxon rank-sum test	z = 2.64, p < .01	z = 1.42, ns	z = 1.98, p < .05

#### 4.1. Respondents and Procedure

The respondents were first-year MBA students, who were participating in a daylong orientation program. Students were seated at separate tables in a large meeting room. As a break between the orientation activities, they were invited to purchase a dinner certificate at a nearby restaurant. The restaurant is a local landmark and is within 3–4 minutes walking distance of the school campus. The certificate was described as follows:

The certificate is good for up to \$175, and can be used on a single occasion within the next three months. The certificate may be used to purchase any food or beverages on the menu, and may include payment for taxes and a gratuity.

We elicited reservation values for the certificate with the Becker-DeGroot procedure (Becker, DeGroot, and Marschak, 1964). Like the second-price auction in Study 1, this mechanism is also “incentive-compatible,” i.e., it provides no incentives for overstating or understating true maximum willingness-to-pay. The mechanism was explained as follows:

- Step 1: The price of the certificate will be determined by drawing a number at random, from zero up to the face value of the certificate (each number is equally likely).
- Step 2: A winner will be selected at random from the respondents.
- Step 3: If the value stated by the winner is greater than the price randomly selected in Step 1 then the dinner certificate will be sold at that randomly selected price. If the value stated by the winner is lower than the price, then alternative winners will be selected until the dinner is sold to someone.

Although the second-price auction and Becker-DeGroot procedure are strategically equivalent (in both cases respondents should simply write down their reservation values), the latter procedure tends to provide more surplus to the winner, which was important in the context of the student orientation setting.

The study divided the respondents into four groups, according to anticipated method of payment and two types of personal identification methods. The two payment methods were unchanged from the first study (credit card versus cash payment). The two identification methods were either a sequence of any four characters (letters or digits), or type and digits 5–8 of a major credit card owned by the respondent (Visa, Amex, MasterCard). This identification manipulation was designed to vary customers’ exposure to credit card logos by prompting respondents in the latter condition to pull out and examine their credit cards. Note that while in Study 1, the method of identification was *congruent* with the method of payment, in this study, we created a  $2 \times 2$  design, varying identification independently of payment method.

Table 2. Study 2: Mean values for the \$175 dinner certificate, by payment method and identification method

Payment method	Any 4 characters	Credit card digits
Cash mean	\$77.08 (N = 43, std. err = 5.90)	\$52.80 (N = 45, std. err = 4.83)
Credit card mean	\$67.12 (N = 46, std. err = 5.71)	\$71.78 (N = 34, std. err = 5.56)
Credit card premium	-13%	+36%
t-test	t = 1.21, ns	t = 2.58, p < .05
Cash median	\$80.00	\$50.00
Credit card median	\$62.50	\$69.00
Wilcoxon rank-sum	z = 1.42, ns	z = 2.45, p < .05

#### 4.2. Results

The mean values by condition are presented in Table 2. There are several interesting comparisons.

First, the two diagonal cells, where payment method is congruent with identification method, are a replication of Study 1. However, this time we find no significant difference between the credit card and cash conditions ( $t = .66$ , ns; Wilcoxon Rank Sum:  $z = .69$ , ns).

Second, payment method has a significant effect, but only when analysis is restricted to students who supplied the credit card digits ( $t = 2.58$ ,  $p < .05$ ; Wilcoxon Rank Sum:  $z = 2.45$ ,  $p < .05$ ). Within these groups, respondents who anticipated paying by card wrote down values 36% greater than those who did not. For students who did not provide their credit card digits as identification, actual payment method made no significant difference ( $t = 1.21$ , ns; Wilcoxon Rank Sum:  $z = 1.42$ , ns).

Third, values in the two congruent conditions are significantly greater than the values in the non-congruent conditions (diagonal cells versus non-diagonal cells;  $t = 2.63$ ,  $p < .01$ ; Wilcoxon Rank Sum:  $z = 2.78$ ,  $p < .01$ ). We conjecture that this effect might be due to the rather unusual nature of the request for credit card digits in the cash payment condition. The cover story for the upper-right cell is the least plausible, and this may have depressed these bids.

Finally, the main effects of payment method and identification method were not significant.

#### 5. Conclusions

We offer no theory explaining the presence or size of the credit card premium observed in Study 1. However, we do believe that, taken together, the studies offer some insight as to the cause of the effect.

First, the two studies appear to exclude liquidity constraints as a complete explanation. If the premium is due solely to liquidity constraints, then it should increase with the size of the loan, and should have been greater in Study 2 than for any of the prizes in Study 1. The failure to observe any credit card premium between the two congruent conditions in Study 2 is not consistent with this prediction. Furthermore, given the random assignment across

conditions, we can presume that the “credit card” and “cash” populations in Study 1 are approximately equivalent, both in terms of their interest in the prizes and in their financial characteristics. This means that the “median respondent” who was willing to pay up to \$25 for the Celtics tickets under the cash condition would have been willing to pay up to \$41 in the credit card condition. If the lower value in the cash condition is truly due to a hard liquidity constraint, then this “median student” would have been willing to pay a lender up to \$16 (\$41–\$25) for the ability to increase their value by any amount (up to \$41). Even if we entertain more complex financial explanations (e.g., maintaining some precautionary cash balances, and so forth), it seems implausible that our respondents would accept loans at the high exchange rates that the ratio of credit card to cash values implies. It is difficult to believe that an MBA student would accept a 64% surcharge in exchange for the privilege of paying by credit card instead of cash!

Second, the information provided about the market value of the products offered in the two studies varied. In the first study we used tickets to a sold-out sporting event, for which the value was unstated, and in the second study we used a gift certificate of explicit value. This difference was designed to investigate whether the credit card premium arises because customers adjust their valuations from different anchoring points in the cash and credit card conditions. The stronger evidence of the effect in the first study is consistent with this theory. However, the effect did not disappear entirely in the second study. Payment method had a significant effect amongst respondents exposed to the credit card logo.

Third, payment method and exposure to credit card logos were separately manipulated in the second study. The possibility that the credit card premium is due to an association bias with the logo predicts that the premium depends upon exposure to the logo rather than the payment method. The findings in the second study are not consistent with this prediction. Although there was some evidence of a payment effect, there was no evidence that exposure to the logos increased willingness to pay.

In summary, this is the first study that demonstrates that willingness-to-pay is increased when customers are instructed to use a credit card rather than cash. The results are surprising both due to the size of the premium and the ubiquity of credit card use. The variance we observe in the premium provides a hurdle to other explanations and a means of validating alternative hypotheses.

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