

# Supplementary Material for the manuscript

## **Anchoring and Interactivity in the Digital Age: How Online Interfaces Reshape Credit Card Repayment Decisions**

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These materials have been supplied by the authors to aid in the understanding of their paper. The AMA is sharing these materials at the request of the authors.

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### Choice Architecture and Warnings: Experiments in online credit card payments ( )

Created: 06/01/2023 01:16 PM (PT)

This is an anonymized copy (without author names) of the pre-registration. It was created by the author(s) to use during peer-review.  
A non-anonymized version (containing author names) should be made available by the authors when the work it supports is made public.

#### 1) Have any data been collected for this study already?

No, no data have been collected for this study yet.

#### 2) What's the main question being asked or hypothesis being tested in this study?

In experiment 1: What are the effects on credit card payment decisions of adding information and highlighting low or high costs?

In experiment 2: Are treatment effects of experiment 1 different for people with liquidity constraints?

Our main hypotheses are:

H1 - Credit card payment amounts increase when respondents receive general information about the consequences of "full payment," "minimum payment," and "other" payments relative to the baseline treatment.

H2 - Credit card payment amounts increase (decrease) when respondents receive customized warnings about the high (low) costs of unpaid amounts.

H3 - Treatment effects are heterogeneous across liquid and non-liquid constrained payment scenarios.

#### 3) Describe the key dependent variable(s) specifying how they will be measured.

Key dependent variables are:

a) The amount of money indicated in the payment decision as a proportion of the available balance. It is important to consider that in Experiment 2 full payment is not possible due to liquidity constraints in the payment scenario.

b) The likelihood that people pay the full amount, the minimum or other payment amounts.

c) Changes in payment decisions before and after receiving a warning.

#### 4) How many and which conditions will participants be assigned to?

All participants will make two payment decisions. They are first presented with a general payment scenario that varies by treatment (two), and then they are provided with a warning (two treatment variations) and are asked if they want to reconsider their initial payment decision. Participants are assigned to one of four experimental conditions:

1 - Control-interest: without information about the consequences of each payment option. Respondents assigned to this group can reconsider their decision after a warning highlighting the interest costs of the payment decision.

2 - Control-debt: without information about the consequences of each payment option. Respondents assigned to this group can reconsider their decision after a warning highlighting the total debt costs of the payment decision.

3 - Information-interest: with information about the consequences of "full payment," "minimum payment," and "other" payments. Respondents assigned to this group can reconsider their decision after a warning highlighting the interest costs of the payment decision.

4 - Information-debt: with information about the consequences of "full payment," "minimum payment," and "other" payments. Respondents assigned to this group can reconsider their decision after a warning highlighting the total debt costs of the payment decision.

We use this design in two experiments that vary in terms of the information the participants receive regarding their credit card balance:

In experiment 1, participants are not given any information about the amount of money they have available to pay the bill and have no budgetary restrictions. This is the standard scenario for credit card payment experiments.

In experiment 2, participants are presented with a scenario in which they do not have enough money to pay the bill. They are forced to choose between making a "minimum payment" or deciding on an amount using an "other" payment option.

Respondents of experiment 1 were excluded from participation in experiment 2.

**5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.**

In both experiments:

We will compare the main effect of "Control" vs. "information" treatments to examine H1, and the main effect of "Interest" vs. "Debt" treatments to examine H2. We will run linear regression models (linear probability models for dummy variables), as well as logit models and multinomial models for hypothesis testing.

We will use the first decision of participants that decide to pay the "Full Amount" as a baseline reference to compare other treatments-scenarios. It is especially interesting to evaluate if there are differences between the first and second decisions of people that decided to pay everything in decision one and could potentially pay less if they are asked to make a second choice.

For each experiment, we will examine treatment heterogeneity for gender, SES, financial literacy, psychological ownership and diminishing sensitivity.

Across experiments 1 and 2, we will evaluate differences based on liquidity constraints.


**6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.**

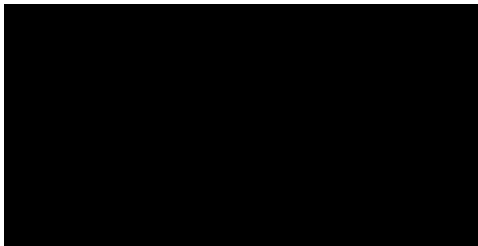
We will use observations for anyone that reaches the treatment section of the experiment, and provide observations on the dependent variable of interest.

**7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.**

The desired sample size is 1000 per experiment, which is approx 250 per treatment, and a total of 2000 participants in the two experiments. The exact number is controlled by a third party, a market research company.

**8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)**

Funding agency Grant 



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**Dynamic references in credit card payments, may 2024 (#174051)**

Created: 05/07/2024 07:57 AM (PT)

This is an anonymized copy (without author names) of the pre-registration. It was created by the author(s) to use during peer-review.  
A non-anonymized version (containing author names) should be made available by the authors when the work it supports is made public.

**1) Have any data been collected for this study already?**

No, no data have been collected for this study yet.

**2) What's the main question being asked or hypothesis being tested in this study?**

What are the effects of providing reference points highlighting the consequences of payment decisions?

Do dynamic references change payment behavior?

Does it depend on whether they start at a low or high value?

**3) Describe the key dependent variable(s) specifying how they will be measured.**

Key dependent variables are:

- a) The amount of money indicated in the payment decision as a proportion of the statement balance.
- b) The likelihood that people pay the statement balance, minimum, or other amounts.
- c) The distribution of payments
- d) The response times: how long it took participants to make the decision
- e) Participant confidence in their decision

**4) How many and which conditions will participants be assigned to?**

All participants will make one payment decision in one of five randomly assigned conditions:

- 1. Control: the dual-payoff scenario used in the US and other countries (status quo), including a table with the costs of always paying the minimum and a reference of the savings if a person pays the debt off in three years.
- 2. Statement balance: This treatment changes the three-year payment reference of the status quo for a reference indicating the savings if a person pays the statement balance.
- 3. Reference table: This treatment includes a table with multiple reference points, which allows people to observe the changes in savings for each \$100 extra they pay.
- 4. Slider-low: This treatment starts the user interface with the same information as the Control but adds a slider that people can move to observe the same reference points as the Reference table treatment. The slider starts at the left (low value or three-year payment reference).
- 5. Slider-high: This is the same as treatment 4, but the slider starts at the right (high value or statement balance). It is a variation on the dynamic treatment, where the slider has an initial reference set to the statement balance, as in the treatment "Statement balance."

**5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.**

We compare the payment decisions (and the time it takes a person to make a decision) in "Control" vs. each of the four treatments using linear regression models or linear probability models for dummy variables (we will also analyze the data using logit and multinomial models).

We will use statistical estimations such as the Kolmogorov-Smirnov tests to compare distributions.

**6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.**

We will use observations for anyone who enters a payment decision.

**7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.**

The desired sample size is 2500 respondents, approximately 500 per treatment. A third party, a market research company, controls the exact number.

**8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)**

We will examine treatment heterogeneity (e.g., by gender, SES, financial literacy, and others).

# Experiment 1 – Questionnaire - English

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I1 - Thank you very much for participating in this survey.

On this occasion, we are interested in knowing your opinion on the use of credit cards, which allow you to acquire products and services through debt that must be paid later in one or more installments.

We're surveying a small group, so your response is very important and will help you understand how people make decisions. We appreciate your time and dedication in sharing your opinion. This survey will take no more than approximately 7 minutes. All responses are anonymous and confidential. If you have any questions, please feel free to contact us:

████████████████████

By clicking the "Next" button you confirm that your participation is voluntary and that you can terminate your participation at any time and for any reason.

Thank you very much in advance.

---

I2 - Please answer the following questions before starting the survey:

	Yes	No
I am 18 years of age or older	<input type="radio"/>	<input type="radio"/>
I have read and understood the above information	<input type="radio"/>	<input type="radio"/>

E3 - Now, we will verify if you are eligible to participate in this survey. Just as an example, you can see below some credit cards that are in the Chilean market. If you have a credit card that is not pictured, still consider it when answering the questions below.

How many credit cards did you use to pay for something in the last year?

- ☐ I don't have or haven't used a credit card
  - ☐ I'm not sure if I've used a credit card
  - ☐ I don't have one, but I'd like to have a credit card soon
  - ☐ I used only one credit card
  - ☐ I used 2 credit cards
  - ☐ I used 3 or more credit cards
- 

E4 - When was the last time you used a credit card to pay for something?

- ☐ Less than a month ago
  - ☐ More than a month ago, but less than 6 months ago
  - ☐ More than 6 months ago, but less than a year ago
  - ☐ Over a year ago
  - ☐ I don't have or don't use a credit card
-

info - On the next screen you will see information about paying for a credit card.

Imagine it's your card and you're about to make your monthly payment. All the money available to pay is in your checking account and you have no line of credit.

Taking this scenario into consideration, decide how much to pay.

Click the "Next" button to view the payment website.

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[Standard Payment Baseline Screen – No Liquidity Constraints]

How much do you want to pay?

- ☐ Total to be paid
  - ☐ Minimum Payment
  - ☐ Other amount: \_\_\_\_\_
- 

[Treatment 1: Descriptive Language Framing Screen – No Liquidity Constraints]

How much do you want to pay?

- ☐ Total to be paid: By paying the total, you will avoid additional interest and late fees.
  - ☐ Minimum payment: By paying the minimum, you will pay additional interest but avoid late fees.
  - ☐ Other amount: The higher the amount, the less additional interest you will pay. You will pay late fees if you pay less than the minimum.
- \_\_\_\_\_
- 

[Treatment 2: Low-Cost Reference Point – Standard Wording Screen – No Liquidity Constraints]

You can confirm or change your decision. Press "Next" to continue with the survey.

- ☐ Total to be paid
  - ☐ Minimum Payment
  - ☐ Other amount: \_\_\_\_\_
-



[Treatment 3: High-Cost Reference Point – Standard Wording Screen – No Liquidity Constraints]

You can confirm or change your decision.

Press "Next" to continue with the survey.

- ☐ Total to be paid
  - ☐ Minimum Payment
  - ☐ Other amount: \_\_\_\_\_
- 

[Treatment 2: Low-Cost Reference Point – Descriptive Language Framing Screen – No Liquidity Constraints]

You can confirm or change your decision.

Press "Next" to continue with the survey.

- ☐ Total to be paid: By paying the total, you will avoid additional interest and late fees.
  - ☐ Minimum payment: By paying the minimum, you will pay additional interest but avoid late fees.
  - ☐ Other amount: The higher the amount, the less additional interest you will pay. You will pay late fees if you pay less than the minimum.
-

[Treatment 3: High-Cost Reference Point – Descriptive Language Framing Screen – No Liquidity Constraints]

You can confirm or change your decision.  
Press "Next" to continue with the survey.

- ☐ Total to be paid: By paying the total, you will avoid additional interest and late fees.
- ☐ Minimum payment: By paying the minimum, you will pay additional interest but avoid late fees.
- ☐ Other amount: The higher the amount, the less additional interest you will pay. You will pay late fees if you pay less than the minimum.
- 

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[Standard Payment Baseline Screen – With Liquidity Constraints]

How much do you want to pay?

- ☐ Total to be paid
- ☐ Minimum Payment
- ☐ Other amount: \_\_\_\_\_
- 

[Treatment 1: Descriptive Language Framing Screen – With Liquidity Constraints]

How much do you want to pay?

- ☐ Total to be paid: By paying the total, you will avoid additional interest and late fees.
- ☐ Minimum payment: By paying the minimum, you will pay additional interest but avoid late fees.
- ☐ Other amount: The higher the amount, the less additional interest you will pay. You will pay late fees if you pay less than the minimum.
-

[Treatment 2: Low-Cost Reference Point – Standard Wording Screen – With Liquidity Constraints]

You can confirm or change your decision.  
Press "Next" to continue with the survey.

- ☐ Total to be paid
  - ☐ Minimum Payment
  - ☐ Other amount: \_\_\_\_\_
- 

[Treatment 3: High-Cost Reference Point – Standard Wording Screen – With Liquidity Constraints]

You can confirm or change your decision.  
Press "Next" to continue with the survey.

- ☐ Total to be paid
  - ☐ Minimum Payment
  - ☐ Other amount: \_\_\_\_\_
-

[Treatment 2: Low-Cost Reference Point – Descriptive Language Framing Screen – With Liquidity Constraints]

You can confirm or change your decision.  
Press "Next" to continue with the survey.

- ☐ Total to be paid: By paying the total, you will avoid additional interest and late fees.
  - ☐ Minimum payment: By paying the minimum, you will pay additional interest but avoid late fees.
  - ☐ Other amount: The higher the amount, the less additional interest you will pay. You will pay late fees if you pay less than the minimum.
- 

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[Treatment 3: High-Cost Reference Point – Descriptive Language Framing Screen – With Liquidity Constraints]

You can confirm or change your decision.  
Press "Next" to continue with the survey.

- ☐ Total to be paid: By paying the total, you will avoid additional interest and late fees.
  - ☐ Minimum payment: By paying the minimum, you will pay additional interest but avoid late fees.
  - ☐ Other amount: The higher the amount, the less additional interest you will pay. You will pay late fees if you pay less than the minimum.
-

TC1 - We will now ask you a few questions about your credit card experience

Considering the last 12 months, please answer how often you made the following payments:

	Never 1	Almost never 2	Sometimes 3	Almost always 4	Always 5
Paid the total to be paid	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You paid more than the minimum payment and less than the total payable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Paid the minimum payment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You paid less than the minimum payment on the credit card	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Paid \$0 (didn't pay)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Late in paying	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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TC2 - Considering the last 12 months, please answer how you usually pay your main credit card (you can choose the most representative option)

- ☐ In person
  - ☐ Digitally (application or website) of your bank or commercial house
  - ☐ Automatically paying the full amount
  - ☐ Automatically paying an amount other than the total
  - ☐ Another way (indicate which)
- 

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LF1 - The following questions are used to measure certain financial concepts. Answer as best you can, and if you don't know the answer it may indicate that you are not sure. Answer whether the following statement is true or false: "A loan at 3% monthly interest is a better alternative than a loan with 20% annual interest":

- ☐ True
- ☐ False
- ☐ I'm not sure



LF2 - Which of the following alternatives do you think will be worth more after 2 years?

- ☐ \$100,000 received today and then placed in a savings account at a rate of 10% interest compounded annually
  - ☐ \$120,000 received in two more years (starting today)
  - ☐ They would be worth the same
  - ☐ I'm not sure
-

LF3 - If I borrowed \$100,000 today with an annual interest rate of 12%, approximately how much should I pay in interest at the end of 1 month?

- ☐ \$ 2,000
- ☐ \$ 12,000
- ☐ \$ 1,000
- ☐ \$ 4,000
- ☐ I'm not sure

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PS1 - Considering your preferences, please answer the following questions:

	Nothing	1	2	3	4	5	6	A lot
To what extent does the money available on your credit card feel like your own money?	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To what extent does the money available on your credit card feel like the bank's money?	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

DS1 You arrive at a store and are about to buy an LED TV for \$219,990. A friend calls you and tells you that it is available at \$209,990 in a store that is 25 minutes from where you are, what do you do?

- ☐ Buy in store
  - ☐ Shop at the store that's farthest away
- 

C1 - To close this survey, please tell us: What is your current occupation? (mention the most representative of your situation)

- ☐ Employee
  - ☐ Self-employed
  - ☐ Dedicated to housework
  - ☐ Pensioner
  - ☐ Student
  - ☐ Looking for a job
  - ☐ Unemployed
  - ☐ Other: \_\_\_\_\_
-



C2 - In which of these ranges is your monthly income?

- ☐ Less than \$250,000
  - ☐ From \$250,000 to \$500,000
  - ☐ From \$500,001 to \$1,000,000
  - ☐ From \$1,000,001 to \$1,500,000
  - ☐ From \$1,500,001 to \$2,000,000
  - ☐ From \$2,000,001 to \$3,000,001
  - ☐ More than \$3,000,000
- 

C3 - What is the highest level of education you have reached?

- ☐ Complete basic education
  - ☐ Complete secondary education
  - ☐ Some university or technical education (incomplete)
  - ☐ University or technical degree
  - ☐ Postgraduate Studies
- 

PA1 Having completed this survey, we invite you to leave a final reflection on the decisions you made in the hypothetical case presented, in which you were asked how much to pay on a credit card. What things did you consider when deciding how much to pay?

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# Experiment 2 – Questionnaire

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Consent1 - Thank you very much for participating in this survey. We are interested in your opinion about using credit cards, which allow the acquisition of products and services through debt that must be paid off later. We appreciate your time and dedication in sharing your opinion. The survey will take about 4 minutes. All answers are anonymous and confidential. Please answer the following question before you start:

I confirm I am over 18 years old, my participation is voluntary, and I know I can terminate my participation at any time.

☐ Yes

☐ No

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ProlificID - What is your Prolific IDPlease note that this response should auto-fill with the correct ID

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Q145 - Now, we will check if you are eligible to participate in this survey

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CountryResidence - In which country do you currently reside?

▼ United States of America ... Zimbabwe

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CreditCardOwned - Which of these credit cards do you own? You can select more than one option.

- ☐ Visa
  - ☐ MasterCard
  - ☐ American Express
  - ☐ Other
  - ☐ ☒ None
- 

Intro - On the next screen, you will find information about a credit card payment. Imagine it is your card, and you are about to make your monthly payment. Considering this scenario, decide how much to pay.

Please continue to view the payment website.

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[Standard Payment Baseline Screen]

Which payment option will you choose?:

- ☐ Statement balance
  - ☐ Minimum payment
  - ☐ Other amount (\$) \_\_\_\_\_
-

[Statement Balance Treatment Screen]

Which payment option will you choose?:

- ☐ Statement balance
- ☐ Minimum payment
- ☐ Other amount (\$) \_\_\_\_\_
- 

[Table Treatment Screen]

Which payment option will you choose?:

- ☐ Statement balance
- ☐ Minimum payment
- ☐ Other amount (\$) \_\_\_\_\_
- 

[Slider – Low Treatment Screen]

Which payment option will you choose?:

- ☐ Statement balance
- ☐ Minimum payment
- ☐ Other amount (\$) \_\_\_\_\_
-

[Slider – High Treatment Screen]

Which payment option will you choose?:

- ☐ Statement balance
- ☐ Minimum payment
- ☐ Other amount (\$) \_\_\_\_\_
- 

S1 - How confident are you that the decision you made regarding the payment amount was the right one?

	Extremely unconfident	Very unconfident	Unconfident	Neither confident nor unconfident	Confident	Very confident	Extremely confident
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

LateFees\_Intro - For the upcoming two questions, you'll be provided with fictional credit card statements. Answer to the best of your ability, and if you are unsure, feel free to indicate so.

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LateFees1 - Given the following credit card statement:

Credit Card Bill	
Statement balance	\$1,840
Minimum payment	\$37
Current balance	\$2,120
Credit limit	\$3,000

Please indicate the lowest amount that should be paid to avoid late fees, even if interest charges must be paid.

- ☐ \$0
- ☐ \$37
- ☐ \$1,840
- ☐ \$2,120
- ☐ \$3,000
- ☐ It is not possible to know this information
- ☐ I am not sure

LateFees2 - Given the following credit card statement:

Credit Card Bill	
Statement balance	\$1,355
Minimum payment	\$41
Current balance	\$1,713
Credit limit	\$2,000

Please indicate the lowest amount that must be paid to avoid interest charges.

- ☐ \$0
- ☐ \$41
- ☐ \$1,355
- ☐ \$1,713
- ☐ \$2,000
- ☐ It is not possible to know this information
- ☐ I am not sure



FL Intro - The following three questions aim to measure certain financial concepts. Answer to the best of your ability, and if you are unsure, feel free to indicate so.

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FL1 - Suppose you had \$100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow?

- ☐ More than \$102
  - ☐ Exactly \$102
  - ☐ Less than \$102
  - ☐ Don't know
  - ☐ Refuse to answer
- 

FL2 - Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, with the money in this account, would you be able to buy...

- ☐ More than today
  - ☐ Exactly the same as today
  - ☐ Less than today
  - ☐ Don't know
  - ☐ Refuse to answer
-

FL3 - Do you think the following statement is true or false? Buying a single company stock usually provides a safer return than a stock mutual fund.

- ☐ True
- ☐ False
- ☐ Don't know
- ☐ Refuse to answer

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DebtAversion1 - To what extent do you agree or disagree with the following statements?

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I am the type of person who enjoys spending money in the present and then figures out how to manage in the future	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am the type of person who prefers to live without getting into debt or borrowing money	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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DemographicsIntro - Finally, please answer the following three questions about yourself.

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Demo\_UsualPayment - What's your typical credit card bill payment in the last 12 months?

- ☐ The full statement balance
  - ☐ An amount between the minimum payment and the statement balance
  - ☐ Only the minimum payment
  - ☐ Less than the minimum payment
- 

Demo\_Education - What is the highest level of education you have achieved?

- ☐ Less than a high school diploma or equivalent
  - ☐ High school graduate
  - ☐ Some college but no degree
  - ☐ Bachelor's degree
  - ☐ Advanced degree (Master's degree, professional degree, or doctoral degree)
-

Demo\_Income - What is your household's annual income?

- ☐ \$24,999 or under
- ☐ \$25,000 to \$44,999
- ☐ \$45,000 to \$64,999
- ☐ \$65,000 to \$94,999
- ☐ \$95,000 to \$134,999
- ☐ \$135,000 to \$249,999
- ☐ \$250,000 or over

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End Prolific - Thank you for participating in this study. Please click the button below to be redirected back to Prolific and register your submission.

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Free1 - Thank you for your participation. Now that you have finished the survey, we invite you to optionally share a final reflection about the survey.

When you were first presented with a credit card statement in this survey, what factors did you consider when deciding how much to pay?

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Free2 - Do you have any general comments about the survey? Any question that was difficult to understand?

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