THE OTHER MENTAL DEFAULTS OF NON-SALIENT PRICES

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Abstract

The overwhelming majority of empirical studies find that consumers underestimate or underreact to prices that are not salient. Using two framed field experiments in a common consumer setting, I identify that consumers can consistently and significantly overreact to non-salient prices. This departure from empirical findings is consistent with a costly attention model in which consumers assign high "mental default" values to prices that they pay no attention to. In fact, I find that the same consumer can utilize different mental defaults for the same non-salient price in the process of solving different tasks. As a consequence, these task-specific mental defaults need not lead to consistent actions across tasks in the same information environment. I investigate if the origins of mental defaults that produce overreaction to non-salient prices stem from aversion to uncertain prices or from prior beliefs acquired historically in the consumer setting. I find little evidence for the former mechanism but find that consumers who hold prior beliefs that prices are high in this consumer setting drive relatively more of the overreaction to non-salient prices.

Keywords: Price-salience, costly attention, interest rates
JEL: D91, D12, D14, G21, G5
1 Introduction

Empirical studies overwhelmingly find that consumers underreact to non-salient prices. That is, consumers tend to underestimate cost obligations or are more inelastic when cost obligations require more effort to discern. This phenomenon has been heavily documented in the context of sales taxes (Chetty, Looney and Kroft, 2009; Feldman and Ruffle, 2015; Goldin and Homonoff, 2013; Taubinsky and Rees-Jones, 2018) and observed in other settings including tolls, overdraft fees, property taxes, shipping charges and product upgrades (Finkelstein, 2009; Stango and Zinman, 2014; Alan, Cemalciar, Karlan and Zinman, 2018; Cabral and Hoxby, 2013; Hossain and Morgan, 2006; Ellison and Ellison, 2009).

It is not clear, however, why consumers should systematically underreact to known non-salient prices as opposed to overreact to them.\footnote{Certainly consumers may overlook costs that they are not aware of. However, consumers demonstrate underreaction to sales taxes even when explicitly informed of their existence in experimental settings (Taubinsky and Rees-Jones, 2018; Morrison and Taubinsky, 2020). Similarly, consumers who use electronic transponders are made aware of toll charges every time they drive through a tolling location (Finkelstein, 2009).} It is curious that in other fields, people demonstrate aversion to effectively what they must put more effort in comprehending (e.g., compound lotteries, risky lotteries and, at the extreme, lotteries with uncertain probabilities). Certainly, an overreaction to non-salient prices would have significantly different implications for market dynamics (Gabaix and Laibson, 2006; Heidhues, Kőszegi, and Murooka, 2017; Milgrom, 1981), governmental decisions (Finkelstein, 2009) and incidence/efficiency of taxes (Chetty, Looney and Kroft, 2009) than an underreaction to them.

In this paper I investigate if consumers can systematically overreact to known non-salient prices and, if so, the determinants of that overreaction. Documenting overreaction expands the set of implications of non-salient prices in the consumer setting. And understanding drivers of overreactions can provide insight on behaviors in high attention cost settings.

To conduct this analysis, I focus on credit. Interest rates, which are the standard price disclosure methods for credit, may pose as high a barrier for computing cost obligations as do the more popularly studied sales taxes. Both are in percent form. For analysis, I employ two separate real-stakes experiments that recruit from an online labor market. In both experiments, participants are rendered liquidity constrained and must choose between receiving a monthly
income stream in full or using a portion of the income stream to make a purchase. There are several ways to make a purchase. Some participants have the option to first save income for several months in order to make a purchase, other participants can purchase and receive a desired good immediately through the use of costly credit and others have the option to employ either purchasing option. Credit prices, credit price disclosures and purchasing methods vary between participants. Price disclosures resemble the appearance of prevalent contemporary and historical credit disclosures and vary in salience as some communicate price in dollar terms while others employ interest rates. Relatively low but positive credit prices are offered to increase the likelihood of identifying overreactions.

In the first experiment, arms vary by credit price and credit price disclosure method but almost all arms offer both purchasing options. I find no significant difference in good or credit demand across price disclosure methods when credit is free (i.e., at a price of 0% APR). But when credit prices are positive and low, those in interest rate disclosure arms demand significantly less credit than those in dollar disclosure arms. When credit prices are high, those in interest rate disclosure arms purchase significantly more goods than those in dollar disclosure arms. Together, these results are consistent with the existence of heterogeneous responses to non-salient prices where some respondents overreact to non-salient prices and others underreact to them. Those that overreact are identified at low credit prices and those that underreact are identified at high credit prices. Non-salient prices can also reverse the appearance of own price elasticities in both directions. Those that appear to be the most inelastic (elastic) when facing salient prices need not be the most inelastic (elastic) when facing non-salient prices.

An incentivized calculation question in the first experiment confirms that interest rates pose an extremely high barrier for determining credit cost obligations relative to dollar terms. Not only do participants overwhelmingly fail at determining correct credit cost obligations from interest rate disclosures, but they also spend more time on the calculation itself relative to those who face dollar disclosures. The calculation question demonstrates that the high attention costs required to translate interest rate price disclosures into cost obligations effectively obfuscate credit costs.

2 There are indications that a significant portion of the study population is liquidity constrained in real life outside of the experiment.
This is one of the first studies to document overreaction to non-salient prices. To date, the author is only aware of two other empirical studies that record possibly similar phenomenon. Brown, Hossain and Morgan (2010) find that auctions with low shipping charges draw higher revenue if shipping charges are made more salient and that revenues can be significantly boosted by increasing non-salient shipping charges. These results in the shipping charge setting can easily parallel the heterogeneous responses to price salience found in the credit setting of this paper. In a contemporaneous working paper, Morrison and Taubinsky (2020) do not detect overreaction to non-salient sales taxes on average but are able to calculate bounds for the existence of overreactions using a series of within-subject calculations.  

In the second experiment, all participants are offered credit at an even lower positive credit price than in the first experiment. This is done to determine if overreaction persists even if the magnitude of the disclosed interest rate price is fairly small. Arms vary by disclosure methods and purchasing options. Specifically, removing the option to make purchases through savings in some arms effectively converts credit from an optional add-on to a mandatory surcharge incurred in the process of purchasing. This variation allows some testing of ambiguity aversion as well as comparability with other studied settings where non-salient prices tend to be associated with mandatory surcharges (e.g., sales taxes).

The second experiment replicates the finding in the first experiment of a significant overreaction to non-salient prices at low but positive prices. It also checks that observed differences in demand across disclosure methods can be interpreted as overreactions to interest rate disclosures rather than underestimates of prices derived from dollar disclosures (Stango and Zinman, 2009, 2011).

Because credit costs are obfuscated by interest rate disclosures, it is possible that the observed overreaction to non-salient prices is due to ambiguity aversion. Results from the second experiment do not support this explanation. Reporting of uncertainty of credit costs does not significantly differ across price disclosure methods nor is it reduced when the purchasing option with less uncertainty is removed. Rather, evidence points to the role of prior beliefs. It is those who hold prior beliefs that credit is expensive who drive more of the documented overreaction to

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3 Morrison and Taubinsky (2020) inform each participant that they will be making purchasing choices in 3 stores with the given tax regimes: the first store has 0 sales tax, the second store has the same sales tax as the participant's locality and the third store has triple the sales tax of a participant's locality. The variation across store tax regimes allows for within-subject analysis.
non-salient prices. Such a pattern can occur if participants default to priors when attention costs are high and update beliefs when attention costs are low. In this setting, attention costs are sufficiently low when price disclosures are easily translated into cost obligations (e.g., the case of dollar price disclosures) or when price values are more easily processed (i.e., at 0% APR). These results are congruent with costly attention models that allow default beliefs to play a major role such as is the case with the sparsity-based model of Gabaix (2014) and the heuristic model of Morrison and Taubinsky (2020).

While credit is typically an optional add-on, many non-salient prices are associated with mandatory surcharges. Can this difference explain why an overreaction has not been often documented? I find no evidence that credit as a mandatory surcharge causes consumers to overlook non-salient costs to a greater degree than credit as an optional add-on just because participants are not directly prompted to decide whether to incur the costs. And though participants perceive mandatory surcharges to be cheaper than equally priced optional add-ons, this mandatory surcharge-induced "cheapening" does not vary by price disclosure method. By ruling out add-on/surcharge differences, this narrows the reasons for lack of researcher detection of overreactions to: 1) variations in prior beliefs of costs across research settings, 2) variations of attention costs across research settings and 3) researchers studying non-salience at equilibrium prices that are already too high to detect overreactions.

Finally, the two experiments shed light on thought processes employed in high attention cost settings. Overall, in the endeavor to produce adequate responses participants can be characterized as frugal towards attention. First, a reliance on prior beliefs along with an unresponsiveness to large price changes within positive price ranges in high attention cost settings suggests the significant employment of heuristics. Second, there is no significant correlation between borrowing choices and participants' estimates of credit cost obligations when attention costs are high. Also, when attention costs are high, participants spend considerably more time calculating credit cost obligations when prompted than they do making purchasing/borrowing decisions. These two facts suggest that: 1) it is possible for the same participant to employ multiple heuristics within the same information environment and that 2) these heuristics need not be correlated despite being prompted by incentive compatible tasks.

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4 The surcharge induced "cheapening" can be due to mental accounting or an assumption that costs are reasonably priced when mandatory.
fact, while responses to the purchasing/borrowing decision seem to be driven by prior beliefs when attention costs are high, responses to the credit cost calculation question seem to be mostly reliant on the incorporation of salient credit plan features. The fact that participants can employ multiple uncorrelated heuristics in the same information environment highlights a pitfall for researchers. In the processes of eliciting beliefs, a researcher can inadvertently prompt participants to engage in thought processes that may be unrelated to the researcher's primary thought processes of study. In other words, researchers are vulnerable to producing "observer effects" in high attention cost settings. Third, a significant correlation between borrowing choices and participant estimates of credit costs when attention costs are low suggests that the threats from "observer effects" may be less of a concern when attention costs are low.

Aside from contributing to literature on non-salient prices and decision-making in high attention cost settings, this paper also directly contributes to various strands in finance. Adding to literature in financial literacy and marketing that people have difficulties calculating compound interest and translating interest rates into cost obligations (Lusardi and Mitchell, 2011, 2017; Lusardi and Tufano, 2015; Soll, Keeney and Larrick, 2013), this paper establishes a direct relationship between incomprehension and borrowing behavior.

The findings of this paper also contribute to studies on the impacts of credit disclosures. For example, Seira, Elizondo and Laguna-Müggenburg (2017) find that mailings that emphasize credit card interest rates do not have any impact on levels of credit card debt, delinquency, account closing, or switching. Such a result can be easily explained by the finding of non-salience of price disclosure of this paper. And while Stango and Zinman (2009, 2011) find that consumers can underestimate credit prices in terms of interest rates from price disclosures in dollar terms, I find that consumers can both under- and over- estimates cost obligations from interest rate disclosures.

Disclosure methods used in this paper share some similarities with information treatments used in the payday loan field experiment of Bertrand and Morse (2011). Bertrand and Morse find that providing payday loan customers with both longer-horizon price information and the pricing information of competing credit instruments reduces the size of payday loans taken out after treatment (i.e., on the intensive margin). However only when prices are disclosed in
dollar terms rather than in interest rate terms does the information treatment also reduce payday loan demand on the extensive margin.  

The findings of this paper will have the greatest implications for credit instruments that typically only disclose prices in the form of interest rates at the time of loan initiation. Most popular of these credit instruments is credit cards, which are the most widely held type of debt among U.S. households (Bricker et al., 2017). The results of this paper imply that many households do not know how much it costs them to use this type of credit when they initiate a loan. The findings of this paper can explain several of the unique market dynamics specific to credit cards. The existence of consumers who underreact to interest rate price disclosures can motivate anticompetitive behaviors through shrouding, which can explain the decades-long price stickiness of credit cards at high rates (Ausubel, 1991; Calem and Mester, 1995; Murooka and Zaki, 2020). Furthermore, non-salience of interest rate disclosures even at very low but positive prices can explain why when credit card issuers did start to compete on prices that there was a deluge of marketing offers concentrated at the introductory price of 0% APR.

Finally, this paper contributes to marketing literature by analyzing the impacts of making a product feature either optional or mandatory. Most of the literature in this field focuses on strategies of price partitioning of mandatory surcharges (e.g., "Price includes shipping" vs. explicitly listing a separate shipping charge) or bundling (i.e., the selling of multiple goods for one price). But the isolated impact of switching from an optional add-on to a mandatory surcharge without switching price presentation from two prices to one is less frequently studied, to the best of this author's knowledge. The root of the behavioral explanation for why consumers are attracted to bundled goods stems from prospect theory's (Kahneman and Tversky, 1979) prediction that the listing of one "integrated" price will be perceived as cheaper than the listing of an equivalent set of partitioned prices (Drumwright, 1992). I document that consumers perceive mandatory surcharges to be cheaper than equivalently priced optional add-ons even if prices

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5 Because payday loans, by law, must disclose prices both in interest rate and in dollar terms, the mechanisms that drive results in Bertrand and Morse (2011) are not related to cost comprehension. Rather, possible mechanisms include improved evaluation through the presence of comparison anchor prices, the extension of borrower narrow decision frames or the reduction of procrastination by the presence of cost information over longer horizons.

6 "Closed-end" credit instruments like auto loans and payday loans disclose interest rates alongside analogous pricing information in dollars (i.e., finance charges, which are the summed amount of interest charges over the life of a loan). However, line-of-credit instruments, such as credit cards, disclose interest rates, without analogous dollar terms, at the time consumers make borrowing or purchasing decisions.
appear partitioned across all offers. In other words, making a price component mandatory for a purchase can cause price perceptions to change even if price presentation does not change.

The paper proceeds as follows. Section 2 presents details, results and discussion of the first experiment. It also includes a costly attention model that corresponds with the setting. Section 3 presents details, results and discussion of the second experiment. And Section 4 examines characterizations of thought processes employed in high attention cost settings gleaned from responses and behaviors across the two experiments. Section 5 concludes.

2 Experiment 1

2.1 Experiment Design

The first experiment entails a purchasing/borrowing decision and a calculation question. All participants are presented with a monthly income stream of $5 a month for 13 months. This income stream can be used, if desired, to make a purchase from a menu of discounted gift cards that range in price from $10 to $50 (see Appendix Figure B.1). To parallel liquidity constraints, the income stream is intentionally insufficient for making any immediate purchase. A participant can choose to receive the income stream in full as scheduled. If, however, the participant wants to purchase a gift card, then they can do so through "savings." Specifically, the consumer will forgo receipt of income stream payments for 2 to 10 months, depending on the price of the desired gift card, until enough income is "saved" up. At that point, the consumer will receive a redemption code for the gift card. Then any remaining income stream payments will resume as scheduled.

Alternatively, some participants are also offered the option to make a "credit" purchase. This allows them to obtain the gift card immediately but requires repayment from the income stream at a cost. Once credit plans are repaid, which can take between 2 to 13 months depending on the price of the credit plan and the gift card, participants resume receipt of any remaining scheduled income stream payments.

In the purchasing/borrowing decision, participants are tasked with deciding whether to make a gift card purchase, and if credit is available, whether to use credit or savings for the purchase. Participants are assigned to either a no credit arm or one of 12 arms that vary by credit price and credit price-disclosure method:

7 Gift Cards are priced at approximately 80% of their purchasing value.
• Arm 1: No "credit" purchase – Participants can only purchase through "savings."
• Arms 2 – 4: Interest Rate, Base – Participants have the option to purchase through "savings" or through "credit." Depending on arm, credit price is 0, 18 or 42% APR. Credit price is disclosed as a monthly periodic percentage rate (MPR).
• Arms 5 – 7: Interest Rate, APR – The "Interest Rate, Base" arms but price disclosures also include the annualized percentage rate (APR) in addition to the MPR.
• Arms 8 – 10: Interest Rate, Focus-on – The "Interest Rate, Base" arms but the portion of disclosures that contain precise price information is bolded, underlined, in larger font and red color.
• Arms 11 – 13: Dollar Finance Charge – Participants have the option to purchase through "savings" or through "credit." Depending on arm, credit plan price is 0, 18 or 42% APR. Credit price is disclosed as a dollar finance charge (i.e., the summed up dollar amount of interest charges accrued over the life of the loan).

Examples of these disclosure methods can be found in Appendix Figure B.2. And a crosswalk between interest rate and dollar finance charge posted prices can be found in Appendix Table B.1. There are three different interest rate price disclosure methods used in this experiment that potentially vary the salience of credit costs. The "Base" interest rate disclosure essentially provides directions for how to apply a monthly periodic interest rate (MPR) in order to calculate credit cost obligations. This disclosure method may be less familiar to experiment participants in today's credit environment. The "APR" arm provides the corresponding APR to an MPR, which is the standard price disclosure for most credit offered today. The directions of the "Base" credit plan appear in fine print. To reduce the amount of effort needed to locate the most pertinent price information visually, the "Focus-on" credit arm bolds, underlines, increases font of and changes color of the portion of the fine print that includes the interest rate.

The use of interest rate and dollar finance charge disclosures in the credit setting parallel the use of exclusive and inclusive sales taxes, respectively, in sales tax salience experiments. Not only is an interest rate in the form of a percent as is common with sales taxes, but also it requires the periodic application of that percent to calculate the stream of credit cost obligations. Hence, the assumption in this experiment is that interest rate price disclosures are less salient than dollar
finance charge price disclosures because they presumably require more attention to process cost obligations. I investigate the validity of this assumption in the calculation question of the experiment. Aside from the parallels with the sales tax setting, the chosen price disclosure methods in this experiment have significant real-world relevance. As discussed further below, the appearance of the credit plans in this experiment mirror historically prominent consumer credit plans that were readily accessible to large swaths of the U.S. population in the 20th century before the entry of banks into the consumer credit market.

After participants make their purchasing/borrowing decision, they proceed to the calculation question. The objective of the calculation questions is to identify if there is variation in salience across price disclosure methods in terms of ability and effort required to translate them into cost obligations. Participants are asked to calculate the number of months it would take to pay off a gift card priced at $40 and purchased using a 42% APR credit plan (see Appendix Figure B.3). Price disclosure methods used in the calculation question match those assigned in the purchasing/borrowing decision. Not only is response recorded for this question, but so is time spent on the question itself, which can proxy effort. To motivate effort, participants are offered a chance of financial reward if they answer the calculation question correctly.

A possible confounding factor when trying to isolate the channel of salience in the credit setting is non-rational behaviors spurred on by flexibility features of many popular credit instruments. For example, participants who are familiar with credit cards may recall the ability to avoid any credit interest rate charges by repaying credit balances within a grace period. Ausubel (1991) conjectures that this impacts borrowing demand as some consumers are overoptimistic of their repayment speed and correspondingly systematically underestimate the credit costs they will eventually incur. If this tendency more likely occurs in interest rate arms than in dollar finance charge arms because of the former's close resemblance to credit card disclosures, then demand for interest rate arm credit may be greater than dollar finance charge arm credit. To abstract from this channel, I effectively turn all credit flexibility features off by setting monthly income stream payments exactly equal to the minimum monthly credit plan obligations – $5. In this way, it is impossible for participants to avoid incurring interest charges if they decide to use a credit plan.

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8 The calculation question is asked after the purchasing/borrowing decision to avoid any influence on the purchasing/borrowing thought process.

9 This calculation question is similar to the one used in (Soll, Keeney, and Larrick, 2013).
As a note, the chosen disclosure methods used in this experiment have significant historical precedent in the consumer credit setting. Today, the dollar finance charge is disclosed when contracting into closed-end loans such as mortgages, auto-loans and payday loans. It is not disclosed when contracting into the most popularly held credit instruments − revolvin

Today, the dollar finance charge is disclosed when contracting into closed-end loans such as mortgages, auto-loans and payday loans. It is not disclosed when contracting into the most popularly held credit instruments − revolving credit such as credit cards and lines of credit. This is due to the flexibility of these instruments. Historically, however, the dollar finance charge was a dominant price disclosure method for revolving credit offered by retailers (i.e., customer store credit accounts) for at least the first two-thirds of the 20th century in the United States. For an example see Appendix Figure 1, Panel A. Many middle-class consumers were familiar with the dollar finance charge disclosure method since retailers were the main creditors for consumer goods for most of the 20th century prior to the rise of bank issued credit cards (Murooka and Zaki, 2020). Retail accounts with dollar finance charge disclosures were often referred to as "installment" or "time" credit accounts and the dollar finance charge itself was referred to as the "time", "carrying" or credit charge. I attempt to mirror the appearance of these historic credit plans in the dollar finance charge arms of the experiment.

Interest rate price disclosures started appearing in store "revolving" credit accounts subsequent to installment credit accounts and eventually overtook them in popularity. Revolving credit accounts resemble credit cards in appearance but were generally exclusive to each retailer. Initially, the main price disclosure for revolving accounts was the monthly periodic interest rate (MPR, see Appendix Figure 1, Panel B). After passage of the Truth in Lending Act (TILA) of 1968, which mandated the disclosure of the annualized percentage rate (APR), retailers disclosed both MPR and APR together in retail credit contracts (see Appendix Figure 1, Panel C). Again, I attempt to mirror the appearance of these credit instruments in the interest rate arms of the experiment.

2.2 Theoretical Framework

The purchasing/borrowing decision can be modeled within a costly attention framework. Let $v$ be the value of a good for a given consumer, $c_s$ the cost obligation if purchasing through "savings" and $c_c$ the cost obligation if purchasing through "credit." $c_s$ is transparent to the consumer. If credit cost is salient, then $c_c$ is also transparent to the consumer. If credit cost is not salient, then the consumer holds prior $\ell_c$ and can uncover true credit cost $c_c$ if they expend
attention with associated cost $\lambda$. Let $PV(\cdot)$ be the present discount value operator, a function of a consumer's time preferences.

In the case of salient credit costs, a consumer will make a purchase if $PV(c_s) \leq PV(v)$ or if $PV(c_c) \leq v$. That is, a consumer will make a purchase if the present value of the cost associated with purchasing through savings is less than the present value of the good received through savings or if the present value of the cost associated with purchasing through credit is less than the value of receiving the good today. If the first condition holds but the second does not, then the consumer purchases through savings. If the second condition holds but the first does not, then the consumer purchases through credit. In the case that both conditions hold, then the consumer will purchase through credit if $PV(c_c) - PV(c_s) \leq v - PV(v)$. That is, a consumer chooses a credit purchase over a savings purchase if the added cost of paying for credit is less than the added benefit of receiving the good today instead of later. Consumers for which $PV(c_s) \leq PV(v)$ always make a purchase, either through savings or through credit, regardless of the cost of credit. I will refer to these consumers as "always purchasers." Consumers for which $PV(c_s) > PV(v)$ and for which there exist some $c_c$ such that $PV(c_c) \leq v$, will only purchase through credit in the instances that they do make a purchase. I will refer to these consumers as "credit-only purchasers." "Always purchasers" either value the good more or are more patient than "credit-only purchasers."

If credit cost is not salient, $PV(c_s) \leq v$ and $PV(c_s) > PV(v)$ (i.e., no purchases through savings), then a consumer who does not expend attention will make a credit purchase. If they do expend attention and if $PV(c_c) \leq v$, then they will not change credit usage. If, on the other hand, they expend attention and $PV(c_c) > v$, then they will refrain from making any purchase. The consumer will only expend attention if the expectation of possible gains from avoidance of the credit purchase outweighs the cost of attention, i.e. if

$$\int_{x=\inf A: \{PV_{c_c} \in \mathbb{R} : PV_{c_c} > v\}} Prob(x) (-v + x) dx > \lambda.$$  \hspace{1cm} (1)

Here $PV_{c_c}$ are present discounted values of possible credit cost obligations and $\overline{PV}_{c_c}$ is the maximum $PV_{c_c}$. $\overline{PV}_{c_c}$ can be based on consumer beliefs or known setting conditions, such as usury ceilings. Hence, if a consumer is very certain of their prior, attaches very low probabilities
to very high credit cost obligations, values the good very highly or faces very high \( \lambda \) then they will not expend attention in order to learn \( c_c \) and will purchase through credit.

If instead the consumer has prior \( \hat{c}_c \) such that \( PV(\hat{c}_c) > v \), then they will not make a purchase if they do not expend attention. They will only make a credit purchase if they expend attention and find a \( c_c \) such that \( PV(c_c) \leq v \). Similar to before, they will only expend attention to learn true \( c_c \) if the expectation of possible gains from a credit purchase outweighs the cost of attention, i.e. if

\[
\max A := \{ PV_{c_c} \in \mathbb{R} : PV_{c_c} \leq v \} \\
\int_{x=PV_{c_c}} \text{Prob}(x) \, (v - x) \, dx > \lambda ,
\]

where \( PV_{c_c} \) is the minimum \( PV_{c_c} \).

If \( PV(\hat{c}_c) - PV(c_s) \leq v - PV(v) \) and \( PV(c_s) \leq PV(v) \) (i.e., always making a purchase), then a consumer who does not expend attention will purchase with credit. They will only refrain from using credit when making their purchase if they expend attention and find a \( c_c \) such that \( PV(c_c) - PV(c_s) > v - PV(v) \). The consumer will only expend attention if the expectation of possible gains from avoidance of credit outweighs the cost of attention, i.e. if

\[
\inf A := \{ PV_{c_c} \in \mathbb{R} : PV_{c_c} - PV(c_s) > v - PV(v) \} \\
\int_{x=\inf A} \text{Prob}(x) \, (-v + PV(v) + x - PV(c_s)) \, dx > \lambda .
\]

Finally, if \( PV(\hat{c}_c) - PV(c_s) > v - PV(v) \) and \( PV(c_s) \leq PV(v) \), then a consumer who does not expend attention will purchase through savings. They will instead use credit if they expend attention and find a \( c_c \) such that \( PV(c_c) - PV(c_s) \leq v - PV(v) \). The consumer will only expend attention if the expectation of possible gains from using credit outweighs the cost of attention, i.e. if

\[
\max A := \{ PV_{c_c} \in \mathbb{R} : PV_{c_c} - PV(c_s) \leq v - PV(v) \} \\
\int_{x=PV_{c_c}} \text{Prob}(x) \, (v - PV(v) - x + PV(c_s)) \, dx > \lambda .
\]

### 2.3 Recruitment and Implementation
Participants are recruited through postings on online labor market Amazon Mechanical Turk (MTurk) and complete the experiment remotely through their own Internet connection.\textsuperscript{10} The postings state that participants will receive $2 for completion of the study (which would take between 15–20 minutes) and have a 1 in 30 chance to receive up to $77.50 worth of bonus payments and gift cards. Participants click on a link in the posting to proceed to a randomized arm of the study where they must first complete a tutorial that describes the experiment.\textsuperscript{11} Only after answering tutorial questions correctly are they able to proceed to the experiment questions. No limitations are placed on use of outside tools or help so that participants have access to their natural information environments.

The experiment has real-stakes as participant responses directly impact possible final rewards. Participants are continuously informed throughout the experiment that there is a 1 in 30 chance that their choices will materialize, and hence should make choices based on their true preferences. After completing all questions in the study, participants learn if they will receive rewards beyond participation compensation.\textsuperscript{12} Any financial compensation and rewards are deposited directly into participant MTurk accounts, which can be linked to participant checking accounts. If participant rewards include gift cards, then gift card redemption codes are sent digitally through an MTurk email interface.

The experiment was conducted over several days in February of 2017 with postings occurring at varying times in the day and days in the week. Only participants who live in the United States, speak English, are over the age of 18, and have at least a 90\% MTurk task completion rate could click through a posting to proceed to the study.\textsuperscript{13} 1,460 participants were

\textsuperscript{10} Horton, Rand, and Zeckhauser (2011) find that samples from the MTurk pool demonstrate similar behaviors in common experiments as do those from laboratory and field experiment pools.
\textsuperscript{11} To avoid unintentionally prompting participants to consider costs more so than they usually would prior to the purchasing/borrowing decision, the tutorial does not ask questions on the specifics of costs of credit. Rather it asks questions concerning the mechanics of different components of the experiment (i.e., income stream, purchasing through savings and purchasing through credit).
\textsuperscript{12} Specifically, a participant is prompted to select a number between 1 and 30, inclusively. Then a random number generator does the same. If the numbers match, the participant receives rewards based on experiment response in addition to compensation for participation. If the numbers do not match, the participant only receives compensation for participation.
\textsuperscript{13} Precautions were made to prevent participants from taking the experiment multiple times from the same IP address. A 90\% MTurk task completion rate means that participants have been approved for payment in 90\% of tasks they had previously taken up on MTurk. In two instances, recruitment postings also added the criteria that participants needed to have completed at least 100 previous MTurk tasks. This does not seem to be a binding condition among the majority of recruited participants. Furthermore, dropping
recruited and completed the tutorial section, with between 110 – 115 participants assigned into each of the 13 experiment arms.

There is evidence in the experiment that some participants skip quickly through directions. This could be a strategy for some workers in this labor market to maximize guaranteed income from participating in as many studies as possible, but to not spend time trying to maximize less certain rewards within any one study. I designate experiment participants who spend 2 seconds or less on any one of the directions screens that are identical across all experiment arms as "skippers." In analysis, I present results including and excluding skippers as skippers may be a source of noise. Results remain largely unchanged with the exclusion of skippers.

Demographic data was not collected in this first experiment, though it was collected from the same labor market in the second experiment. A summary of demographic characteristics from the second experiment can be found in Table 1. Several studies have found that MTurk workers are more diverse than student pools but tend to be younger, more educated and have lower income than the general population (Berinsky, Huber and Lenz, 2012; Paolacci, Chandler and Ipeirotis, 2010). This seems to be the case with recruited participants from the second experiment. Only 2.2 percent of experiment participants are 65 years of age or older, compared to around 21 percent of the U.S. adult population. 67 percent of experiment participants have a bachelor's degree or higher, in comparison to 32 percent of the U.S. population over the age of 25. Only 40 percent of experiment participants had a household income above $60,000 in the year prior to the study, compared to 50 percent of the U.S. population. 65 and 19 percent of experiment participants identify as white and black, respectively, compared to 76 and 13 percent of the U.S. population. Furthermore, 84 percent of experiment participants have credit cards and more than half of participants regularly use their credit cards for borrowing (rather than for just convenience). Hence, it is likely that a significant portion of participants is liquidity constrained outside of the experiment.

2.4 Results

responses of all participants who were recruited at the time that this extra criteria was posted does not change the results presented in this section.

A. Purchasing/Borrowing Decision

Figure 1, Panels A and B (and corresponding Table 2) present the extensive margin of the borrowing and purchasing decision, i.e., the percentage of arm participants who use any credit and make any purchases, respectively. For this initial analysis, all interest rate disclosure arms are pooled together for each credit price. Figure 1 excludes "skippers," while Table 2 both includes and excludes "skippers."

When credit is free (i.e., priced at 0% APR), demand does not significantly differ with price disclosure method. Specifically, 50% of dollar finance charge and interest rate arm participants use credit at 0% APR (Figure 1, Panel A that). Correspondingly, 76% and 78% of dollar finance charge and interest rate arm participants make a purchase at 0% APR, respectively (Figure 1, Panel B). In neither case are differences in demand across disclosure arms significant at the 10% level. Hence, if there are differences in salience across disclosure methods, they do not manifest in purchasing and borrowing when credit is free.

At a credit price of 18% APR, the percentage of participants who use credit decreases significantly from the level at 0% APR for both types of disclosure methods (Figure 1, Panel A). That means that a significant portion of participants identify a difference between 0% APR and a positive credit cost, even when price is disclosed as an interest rate in fine print. The first significant difference in demand across disclosure methods is observed at 18% APR. At this price, 36% of dollar finance charge arm participants demand credit while only 26% of interest rate arm participants do. These differences are significant at the 5% level. Hence, unlike in the tax setting, the presumably less salient price disclosure leads to an overreaction to prices rather than to an underreaction. The fact that the percent of participants making purchases at 18% APR does not differ significantly from the percent making purchases at 0% APR for either price disclosure method (Figure 1, Panel B) indicates that it is "always purchasers" who are decreasing their demand for credit at this relatively lower price.

At a credit price of 42% APR, the percentages of participants in the dollar finance charge arm who use credit and make purchases decrease significantly from the levels at 18% APR. In contrast, those in interest rate arms do not respond to this large increase in price. Unlike at 18% APR, this result at the higher 42% APR better conforms to the common findings in sales tax literature that consumers underreact to non-salient prices. Specifically, a price increase from 18% APR to 42% APR leads to a 16 percentage point drop in both borrowing and purchasing among
those in the dollar finance charge arm.\footnote{The fact that purchases of the gift card drop in response to an increase in the price of credit indicates that the demand change is driven by "credit-only purchasers."} In contrast, the same price increase only leads to a 2 and 3.2 percentage point drop in borrowing and purchasing among those in interest rate arms, respectively. As a result, only 62% of participants in the dollar finance charge arm make a purchase at 42% APR. This is equivalent to the percent of participants who make a purchase when no credit is available (see the dashed line in Figure 1, Panel B). In contrast, 72% of those in interest rate arms make a purchase at 42% APR. This 10 percentage point difference in purchasing across disclosure arms is significant at the 5% level.

The pattern of responses to non-salient credit price disclosures is robust to the inclusion or exclusion of "skippers" (see Table 2). It also persists across all unpooled interest rate disclosure arms (see Appendix Figure A.2).

Figure 1, Panels C and D present the intensive margin of the borrowing and purchasing decision (i.e., the conditional dollar amounts borrowed or purchased), respectively, and Panels E and F present the average unconditional amounts borrowed or purchased (i.e., the demand curve), respectively. We see instances in Panel C of differences of conditional amounts borrowed across disclosure methods. However, the conditional amounts borrowed or purchased lie in a fairly small range since most who purchase, purchase the highest value gift card (priced at $50). As a result, the shapes of the demand curves are impacted more by the intensive margin.

\textit{B. Discussion of Purchasing/Borrowing Decision}

The results of the purchasing/borrowing decision are consistent with the existence of heterogeneous responses to non-salient prices where some respondents overreact to non-salient prices and others underreact to them. Those that overreact are identified at low credit prices and those that underreact are identified at high credit prices. As mentioned previously, this is one of the first papers to find an overreaction to non-salient prices in a consumer setting. Heterogeneous responses to non-salient prices can stem from heterogeneity of credit cost priors among participants. I investigate this possibility in the second experiment.

Interestingly, between 34 − 36\% of purchasers (26 − 28\% of participants) forgo purchasing through credit when credit is free. That is, they opt to receive a gift card, on average, 8 months after participating in the experiment rather than within 24 hours. Such a choice possibly demonstrates either a significant degree of mistrust for credit among a large swath of
participants, a preference for receiving purchases at a future date rather than immediately
(possibly for self control-purposes), or an error on the part of the participant. Mistrust of credit
can be easily modeled in the framework presented in Section 2.2. Specifically, it can be modeled
by "always purchasers" who have priors that credit costs are high and no avenue to update these
priors through attention. This would be equivalent to $\lambda = \infty$ (i.e., an infinite attention cost). Such
a scenario can occur if the attention that would lead to a more accurate calculation of credit cost
obligations does not have the ability to overcome mistrust of the lender or fears of hidden credit
costs.

The experiment allows for the separate analysis of behaviors of "always purchasers" and
"credit-only purchasers" even though treatment is assigned between participants. By assuming
that the percentage of "always purchasers" in credit arms is equal to the percentage of purchasers
in the "no credit purchase" arm (i.e., 62%), one can decompose the percentage of purchasers into
three categories: "credit-only purchasers," "always purchasers who use credit" and "always
purchasers who use savings." Under this assumption, the percentage of "credit-only purchasers"
is the percentage of purchasers above 62%. And the percentage of "always purchasers who use
credit" is the percentage of credit purchasers minus the percentage of "credit-only purchasers."
This decomposition can be found in Figure 2. Here we see that disclosure methods can appear to
reverse own price elasticities in both directions. For example, "credit-only purchasers" appear to
be quite inelastic when facing APR disclosures as 86% of those who purchase when credit is 0%
APR continue to purchase (with credit) when credit is 42% APR (Figure 2, Panel B). However,
this inelastic behavior completely reverses when disclosures are in dollar terms. Almost none of
the "credit-only purchasers" who purchase when credit is priced at 0% APR continue to purchase
when credit is priced at 42% APR if prices are in dollar terms (Figure 2, Panel D). On the other
hand, "always purchasers" are elastic when facing APR disclosures as only 27% of those who
purchase thru credit when credit is 0% APR continue to purchase thru credit when credit is 42%
APR (Figure 2, Panel B). However the retention rate for "always purchasers" almost doubles
when credit price is disclosed in dollar terms, indicating an increase in insensitivity to price
(Figure 2, Panel D). Hence, price salience can appear to reverse price elasticity in both
directions. And those who are the most elastic (inelastic) under one price salience regime need
not be the most elastic (inelastic) under another price salience regime.

C. Calculation Question
The conclusion of an overreaction or underreaction to non-salient prices requires the confirmation that interest rate price disclosures are indeed non-salient. That is, interest rate disclosures require a higher level of attention to translate into credit cost obligations than do dollar finance charge disclosures and that attention costs associated with interest rates are sufficiently high enough that participants eschew attention allocation that uncover true credit costs. The calculation question allows us to examine the plausibility of these assumptions. It asks for the number of months it would take to pay off a credit balance for a $40 credit purchase at 42% APR (equivalently, a $7.77 dollar finance charge) with minimum monthly payments of $5 a month. The correct response is 10 months. Both responses and time spent on the calculation question are recorded.

Responses to the calculation question grouped by experiment arm are presented in Figure 3, Panel A. The red bar in each grouping represents the portion of participants in a given arm who answer correctly (i.e., who respond with "10 months"). We see that only between 14 – 19% of participants in interest rate arms are able to determine credit cost obligations correctly. In stark contrast, 57% of participants in dollar finance charge arms are able to determine credit cost obligations correctly. What is more, those in interest rate arms spend significantly more time on the calculation question than those in dollar finance charge arms (Figure 3, Panel B) and both those that arrive at incorrect and correct responses in the interest rate arm spend on average more time on the question than do their counterparts in the dollar finance charge arm (Figure 3, Panel C). Specifically, those in the dollar finance arm spend an average of 63 seconds on the calculation question, while those in interest rate arms spend an average of 91 – 135 seconds. Notably, those that arrive at the correct response in the interest rate arm take four times longer on the calculation question than those who arrive at the correct response in the dollar finance charge arm.

D. Discussion of Calculation Question

The calculation question confirms that interest rate price disclosures require a much higher level of attention to translate into cost obligations than do dollar finance charge disclosures. Participants are overwhelmingly unable to produce correct estimates of cost obligations from interest rate price disclosures despite an allocation of a non-trivial amount of effort. Hence, interest rate price disclosures, though standard, are a very taxing and potentially obfuscating method to relay credit cost information to consumers. This finding is most pertinent
to flexible credit instruments that tend to only disclose interest rates at the time of loan initiation (e.g., lines of credit such as credit cards).

If experiment participants have difficulty translating interest rates into cost obligations in this setting, then presumably they would have an even greater amount of difficulty comprehending cost obligations in more typical settings. This is because the experiment employs the simplest version of a line of credit with all flexibility features turned off. Typically a borrower has at their disposal a wide array of choices for how to repay a line of credit through time. This poses a complex choice problem. But in this experiment, there is only one singular way to repay a credit purchase of a given amount. Hence, the calculation question tests disclosure comprehension for credit in its simplest and most deterministic form.

3 Experiment 2

Since an overreaction to non-salient prices is a fairly novel finding, further investigation is warranted. Several questions arise from the analysis conducted in the first experiment. First, is it really an overreaction that we are observing? Alternatively, we could be observing the effects of "payment/interest bias," which is the tendency to underestimate price in interest rate terms when calculating it from dollar terms such as the principal and monthly payment obligations (Stango and Zinman, 2009, 2011). This bias would cause participants in dollar finance charge arms to underestimate credit costs which would be indistinguishable from an overreaction to interest rate disclosures.

Second, does the inability or unwillingness to determine cost obligations from interest rate price disclosures prevent the adjustment of credit cost beliefs at all positive prices? It may be the case that consumers can still be somewhat sensitive to magnitudes of interest rates even if they cannot translate interest rates into cost obligations. For example, consumers may categorize a price of 18% APR as "expensive" due to the magnitude of "18" but would categorize a price of 3% APR as "cheap" due to the magnitude of "3." Hence, will consumers update their priors in the case that the magnitude of the interest rate price disclosure is extremely low but positive?

Third, what is the driving mechanism of the overreaction? Does ambiguity aversion from obfuscated costs cause the overreaction? That is, do participants eschew cost uncertainty similarly to how participants eschew lotteries of unknown probabilities (Ellsberg, 1961)? It may be that participants prefer to purchase through "savings" rather than face the uncertainty of costs that arise from purchasing with "credit" when prices are disclosed as interest rates. Halevy
(2007) further provides evidence for a connection between ambiguity aversion and the reduction of compound lotteries, an activity that shares many of the same operations required to calculate credit costs from periodic interest charges. On the other hand, could the overreaction to non-salient prices be driven by subjective or prior beliefs of costs rather than discomfort of uncertainty?

Finally, why do we not often observe overreaction to non-salient prices in other settings? Can it be due to the fact that most non-salient prices are associated with mandatory surcharges while credit in this paper's setting is an optional add-on? There are several reasons why price non-salience can have a differing impact depending on whether charges are mandatory or optional. First, because consumers are not directly prompted to decide whether to incur a mandatory surcharge as they are an optional add-on, they may be more likely to overlook charges that are non-salient when they are mandatory than when they are optional. Second, consumers may make an assumption that non-salient mandatory surcharges must be reasonably priced since they themselves have no agency to avoid them or to search for cheaper surcharges (at least locally in the case of sales taxes). Third, consumers may perceive a $1 increase of a mandatory surcharge to be cheaper than $1 increase of the price of a base good because they place the two costs in separate mental accounts. However, mental accounting may not be applied to the same degree for optional add-ons as consumers must make a separate decision concerning the consumption of the add-ons. This may increase the likelihood of optional add-ons being perceived as wholly separate goods whose costs would be placed in the same mental account as those of the base good. If mental accounting is more likely triggered when costs are non-salient, then an overreaction to a non-salient charge will be more muted if the charge is mandatory than if it is optional.  

The second experiment is designed to address these questions to varying degrees. To address whether "payment/interest bias" is causing the appearance of an overreaction, a credit plan is introduced that contains both interest rate and dollar finance charge price disclosures. Consumer demand under this "full disclosure" should be free of "payment/interest bias" and high attention costs. Demand in this arm can be used as a guidepost to whether demand in other disclosure arms is an over- or under-reaction.

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16 I do not propose a reason for why mental accounting is more likely applied when costs are non-salient than when they are salient.
To address whether the overreaction to non-salient prices persists even at low but positive prices, credit offered in the second experiment is priced at 3% APR. This price is far below the average interest rate price on the credit card market and well below the 18% APR "low" price used in the first experiment.

To address if an overreaction is driven by ambiguity aversion, several interventions are implemented. First, immediately after making the purchasing/borrowing decisions, participants are directly asked to recall intermediate thoughts concerning experiment credit costs. Response options include an indication that credit costs were not considered in the purchasing/borrowing decision as well as several characterizations of subjective beliefs and uncertainty of credit costs. If ambiguity aversion does play a role in causing an overreaction to non-salient costs, then more participants should report uncertainty of credit costs in interest rate arms than in dollar finance charge arms. Second, the option to purchase through "savings" is removed from several experiment arms. This should prevent participants from comparing a purchasing option with uncertainty to one without uncertainty. Fox and Tversky (1995) propose that ambiguity aversion manifests from such comparisons.\footnote{This is referred to as the "comparative ignorance hypothesis." This is related to findings in Heath and Tversky (1991), in which participants who feel incompetent are less likely to prefer ambiguous lotteries over more certain lotteries.} If ambiguity aversion drives overreaction to non-salient costs, then removing the option to purchase through "savings" should diminish overreaction to non-salient prices and reduce self-reporting of uncertainty.\footnote{Ambiguity aversion may still remain as participants are still prompted to choose between a credit purchase and not making a purchase. Other factors like mental accounting could also explain a diminishment of overreaction as previously explained.} However, if overreaction to non-salient prices and self-reporting of uncertainty persist at similar levels regardless of the availability of the option to purchase through "savings," then it is less likely that ambiguity aversion drives overreactions. Rather, overreactions to non-salient prices are more likely caused by subjective beliefs of high credit costs. This is reinforced by the fact that participants will necessarily have even higher thresholds for credit costs when there is no option to purchase through "savings." This is because forgoing credit when there is no option to purchase through "savings" comes at the additional cost of forgoing gift card consumption altogether.\footnote{In a setting with a "savings" purchase option, participants purchase through "savings" if and only if \( PV(c_s) \leq PV(v) \) and \( PV(\hat{c}_c) > PV(\overline{c}_c) \), where \( PV(\overline{c}_c) = v - PV(v) + PV(c_s) \). Combining these conditions implies that \( PV(\overline{c}_c) \leq v \). In a setting without a "savings" purchase option, participants forgo}
participants must believe credit costs are fairly high to forgo gift card consumption when the option to purchase through "savings" is not available. To further examine the role of prior beliefs, participants are asked to report their perception of own and market costs of credit outside of the experiment. If prior beliefs are indeed the main drivers of overreactions to non-salient prices, then overreactions should occur more often amongst those who hold prior beliefs that credit is expensive.

To address if overreaction to non-salient prices diminishes if costs are mandatory rather than optional, I remove the option to purchase through "savings." This effectively converts credit from an optional add-on to a mandatory surcharge.

3.1 Experiment Design

The second experiment consists of a purchasing/borrowing decision, a purchasing/borrowing decision follow-up survey, and a demographics and credit environment survey. In the purchasing/borrowing decision, participants are presented with a monthly income stream of $5 a month for 3 months. This income stream can be used to purchase a gift card that costs $10 with a $15 value (see Appendix Figures B.4 and B.5). All participants are offered credit at a price of 3% APR (which corresponds to a $0.04 dollar finance charge). There are two sets of arms. In the first set, participants can choose whether to purchase through "savings" or through "credit," just as they were able to in the first experiment (see Appendix Figure B.4). In the second set, purchasing through "savings" is no longer an option (see Appendix Figure B.5). If a consumer wants to make a purchase, they must do so through credit and receive the gift card immediately. Participants see one of 4 credit price disclosures:

1. **Interest Rate, MPR** – A box marked "Credit Cost" contains the monthly periodic interest rate charge.
2. **Interest Rate, APR** – A box marked "Credit Cost" contains the APR.
3. **Dollar Finance Charge** – A box marked "Credit Cost" contains the dollar finance charge.

\[
\text{credit (and the gift card) if and only if } PV(c^c) > PV(c^{NS}), \text{ where } PV(c^{NS}) = v. \text{ Hence, for those who are "always purchasers" when a "savings" purchase option is available, it must be that } PV(c^c) \leq PV(c^{NS}).
\]
4. *Dollar Finance Charge, APR* – A box marked "Credit Cost" contains the dollar finance charge. In addition, the corresponding cost in APR terms is listed in bold in the fine print.

These disclosure methods can be found in Appendix Figure B.6. Price disclosures, whether they are in dollar terms or interest rate terms are listed very prominently in a box marked "Credit Cost." As in the first experiment, the purchasing/borrowing decision has real stakes and participants are informed that their decision has a probability of materializing.

After making the purchasing/borrowing decision, participants are immediately asked to recall the beliefs and thoughts used in making the decision. As shown in Appendix Figure B.7, participants are asked to recall thoughts concerning the cost of the credit plan. Possible responses include several characterizations of uncertainty combined with leanings towards specific cost beliefs. Alternatively, participants can indicate having more solidly held beliefs of credit costs or ignoring credit costs altogether when making the purchasing/borrowing decision. Finally, participants answer a set of demographic questions and report opinions of credit outside of the experiment. Appendix Figure B.8 shows two pertinent questions asked of participants regarding their opinions of own and market costs of credit.

### 3.2 Implementation

Recruitment for the second experiment parallels that of the first experiment. Participants are recruited through postings on MTurk that state that participants will receive $2 for completion of the study (which should take 15 minutes) and have a 1 in 100 chance to receive up to $20 worth of bonus payments and gift cards. Participants click on a link in the posting to proceed to a randomized arm of the study where they must first complete a tutorial that describes the experiment. Only after answering tutorial questions correctly are they able to proceed to the experiment questions.

The experiment was conducted over several days in May of 2020 with postings occurring at varying times in the day and days in the week. Only participants who live in the United States, speak English, are over the age of 18, and have at least a 95% MTurk task completion rate can click through a posting to proceed to the study. 1,051 participants were recruited and completed the tutorial section, with between 129 – 134 participants assigned to each of the 8 experiment arms. While demographics are summarized in Table 1, balance checks across arms are presented in Appendix Table A.1.
3.3 Results

A. Purchasing/Borrowing Decision

Figure 4 and corresponding Table 3 present the results from the purchasing/borrowing decision. Interest rate and dollar finance charge disclosure arms are pooled together, respectively. Credit demand in interest rate arms is 13 percentage points lower than it is in dollar finance charge arms when all purchasing options are available (Figure 4, Panel A). This difference is significant at the 1% level. In contrast, gift card demand is not significantly different across disclosure arms when all purchasing options are available (Figure 4, Panel B). Together, these results imply that, again, it is "always purchasers" who are driving the overreaction to non-salient prices in this setting. When the option to purchase through "savings" is removed, credit demand in interest rate arms remains 13 percentage points lower than it is in dollar finance charge arms (Figure 4, Panel C). This difference is significant at the 1% level. All these results are robust to the inclusion or exclusion of "skippers" (Table 3) and the unpooling of experiment arms (Appendix Figure A.3).

B. Discussion of Purchasing/Borrowing Decision

Results from the second experiment replicate those of the first experiment. Participants facing interest rate price disclosures demand less credit than those facing dollar finance charge disclosures. The second experiment, however, allows us to verify whether the credit demand gap across price disclosure methods should be interpreted as an overreaction to non-salient interest rate disclosures or an underreaction to dollar finance charge disclosures spurred on by "payment/interest bias." We see in Appendix Figure A.3, Panels A and C that credit demand is highest in the "full disclosure" arm (i.e., when both interest rate and dollar finance charge price disclosures are present) and lowest when only interest rate price disclosures are available. Since attention costs and payment/interest bias are minimized in the "full disclosure" arm, this implies that participants overreact to interest rate price disclosures rather than underreact to dollar finance charge disclosures.

The results also show that a significant overreaction to non-salient prices can occur even at relatively low magnitudes of interest rates. Said differently, very low interest rate values (in

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20 Figure 4 excludes "skippers," while Table 5 presents results that both include and exclude "skippers." Again, participants who spend 2 seconds or less on any one of the direction screens that are identical across all experiment arms are designated as "skippers."
this case 3% APR) are not sufficiently salient for many to update beliefs and reduce overreaction. Only at an interest rate price of 0% APR is an overreaction averted in these experiments, potentially due to a discontinuous drop in required attention to convert interest rate disclosures to credit cost obligations.

C. Follow-up Survey Question

Figure 5 summarizes the self-reported thoughts that participants have on credit prices when making their purchasing/borrowing decisions. Panel A pools all responses among those with two purchasing options into 3 categories: "No Attention" which indicates little thought given to credit costs, "Uncertainty" which indicates some uncertainty towards credit costs and "Stronger Belief" which indicates more solidly held beliefs towards credit costs. We see that regardless of disclosure method, approximately half the participants report holding solid beliefs towards credit costs, a quarter report not thinking about credit costs and another quarter report some degree of uncertainty towards credit costs. However, the type of "Stronger belief" participants hold does differ significantly across disclosure methods. Participants in dollar finance charge arms are 20 percentage points less likely to report believing credit is "expensive" and 15 percentage points more likely to report credit is "cheap" than participants in interest rate disclosure arms (Figure 5, Panel B). Both of these differences are significant at the 1% level. A similar pattern exists in Panel C among those who report being less certain about credit costs.

When the option to purchase through "savings" is no longer available, the distribution of responses among those in interest rate arms remains practically unchanged in terms of higher-level categories (Figure 5, Panel D). This is not the case with those in dollar finance charge arms who are 13 percentage points more likely to hold "Stronger Beliefs" and 9 percentage points less likely to pay "No Attention" when the option to purchase through "savings" is removed. These differences are significant at the 1% and 5% levels, respectively. The types of "Stronger Beliefs" that are reported significantly shift for both disclosure methods with the removal of the option to purchase through "savings." Participants in interest rate arms are 12 percentage points less likely to report that credit is "expensive" and 8 percentage points more likely to report that credit is "cheap" when the option to purchase through "savings" is removed (Figure 5, Panel E). Both of these differences are significant at the 1% level. Similarly, participants in dollar finance charge arms are 5 percentage points less likely to report that credit is "expensive" and 15 percentage points more likely to report that credit is "cheap" when the option to purchase through "savings"
is removed (Figure 5, Panel E). These differences are significant at the 10% and 1% levels, respectively. Finally, when comparing differences in types of "Strong Beliefs" held across disclosure methods, we see that they are almost identical in terms of magnitudes to those found when both purchasing options are available to participants. Specifically, participants in dollar finance charge arms are 21 percentage points less likely to report believing credit is "expensive" and 13 percentage points more likely to report credit is "cheap" than participants in interest rate arms (Figure 5, Panel E). Both of these differences are significant at the 1% level.

D. Discussion of Follow-up Survey Question

If overreaction to non-salient prices is driven by ambiguity aversion, then there should be a greater reporting of "Uncertainty" among those in interest rate arms than among those in dollar finance charge arms. But this is not the case (Figure 5, Panel A). Potentially, even if the percentage of those who claim "Uncertainty" does not significantly differ across disclosure methods, borrowing behaviors among those who claim "Uncertainty" may. Appendix Table A.2, Columns 1-3 show that this is not the case. Those who claim "Uncertainty" in interest rate arms are not significantly less likely to borrow than those who claim "Uncertainty" in dollar finance charge arms. Furthermore, if ambiguity aversion manifests from the comparison of an uncertain purchasing option with a certain purchasing option, then overreaction caused by ambiguity aversion should diminish once that certain purchasing option is removed. However, the overreaction persists even after removal (Figure 4, Panel C). Correspondingly, the percent of interest rate arm participants who report feeling "Uncertain" about credit costs does not diminish with the elimination of the certain purchasing option (Figure 5, Panels D). Hence, these results point to a minimal role for ambiguity aversion driving overreaction to non-salient prices.

By comparison, there is stronger evidence for the role of solidly held subjective beliefs and priors driving overreaction to non-salient prices. The fact that the overreaction to interest rate price disclosures is significant and does not diminish when the option to purchase through "savings" is removed implies that participants who overreact believe credit costs are fairly expensive (Figure 4, Panel C). As an example, an exponential discounter who has a monthly

21 Caution should be taken in comparing borrowing rates among those who report the same cost beliefs as cost beliefs are endogenous to treatment. It is possible that disclosure methods cause participants to switch beliefs but for there to be no discernable difference across disclosure arms in the proportion of those claiming a certain belief. This occurs if people switch in equal numbers from one belief category to another. In such a case, comparing borrowing rates across disclosure arms among people who hold the same beliefs may be an "apples to oranges" comparison.
discount factor of 0.998671 and who is inframarginal with respect to the gift card (i.e., indifferent between the gift card and an equivalent amount of cash) will forgo purchasing through "credit" in favor of purchasing through "savings" if they believe that credit cost is higher than $0.04 in dollar finance charge terms (i.e., the actual price of credit in the second experiment). For this same individual to continue to forgo purchasing through "credit" even when the option to purchase through "savings" is removed, they must believe that credit cost is higher than $5.04 in dollar finance charge terms (i.e., 126 times the pervious credit cost threshold).

Unlike in the case of uncertainty, those who claim holding "Stronger Beliefs" of credit costs in interest rate arms are significantly less likely to borrow than those who claim holding "Stronger Beliefs" of credit costs in dollar finance charge arms (Appendix Table A.2, Columns 4-6). Consistent with this, those in interest rate arms are significantly more likely to report credit as "expensive" and less likely to report credit as "cheap" than those in dollar finance charge arms (Figure 5, Panels B and E). Furthermore, these reported credit cost beliefs are significantly correlated with borrowing decisions. Table 4 reports coefficient estimates of a regression of credit take-up on indicators of credit cost beliefs. In Column 1 we see that those in interest rate arms who believe credit is expensive are significantly less likely to borrow. And in Column 2 we see that those in the dollar finance charge arm who believe credit is cheap are significantly more likely to borrow. We see a similar pattern if we limit the analysis to only those who make a purchase (Columns 3 and 4) and if we remove the option to purchase through "savings" (Columns 5 and 6). Though this analysis cannot determine whether beliefs impact borrowing decisions or if instead borrowing decisions impact reported beliefs, it confirms a correlation between beliefs and borrowing behaviors that is consistent with the conjecture that beliefs drive the overreaction. In the next section, I will examine the relationship between outside-experiment opinions of credit and experiment borrowing behavior to gather additional evidence of the ordering of causality.

E. Opinions Towards Credit Outside of the Experiment

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22 Again, caution should be taken in comparing borrowing rates among those who report the same cost beliefs as cost beliefs are endogenous.

23 than those who pay no attention to credit costs when making their purchasing/borrowing decision. This is among those with access to both purchasing methods.
Since self-reported beliefs of experiment credit costs are endogenous, they do not allow the confirmation of causality. However, a proxy for prior beliefs could provide evidence for the direction of causality. I proxy that a participant has a prior that credit is expensive if they express that their own credit is "Expensive" or if they hold "Negative" attitudes towards credit in general. I check that this proxy is balanced across experiment arms to confirm that there is no obvious impact of treatment on responses (see last row of Appendix Table A.1). If priors drive overreactions to non-salient prices, then those who hold priors that credit is expensive should react more to salient price disclosures of cheap credit than those who do not. Table 5, Column 1 presents the results of a regression of credit demand on credit disclosure method, credit cost prior and the interaction of the two. We do see that, indeed, those who have priors that credit is expensive do react more to salient price disclosures of cheap credit than do those who do not hold those priors. Specifically, participants who hold priors that credit is expensive are 13 percentage points less likely than their counterparts to use credit when faced with interest rate price disclosures. However, their demand increase when faced with dollar finance charge disclosures is 18 percentage points greater than that of their counterparts. Similarly, participants who have priors that credit is expensive are 13 percentage points less likely to say that they value experiment credit and 21 percentage points more likely to say that experiment credit is "expensive" than their counterparts. However, their corresponding probability increase and decrease in response to dollar finance charge disclosures are 14 and 15 percentage points greater, respectively, than that of their counterparts (see Table 5, Columns 2 and 3).

As a check that these proxies really capture priors of credit costs rather than tastes unrelated to credit I repeat the regression exercise with experiment outcomes that are less reliant on credit. Table 5, Columns 4 and 5 present the regression results using gift card demand and perception of gift card attractiveness as outcomes, respectively. Unlike in the case of credit

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24 The regression with gift card demand as an outcome (Table 5, Column 4) omits arms that did not offer a "savings" purchase option because gift card demand in those arms will be highly reliant on credit. This is because purchasing in arms without a "savings" purchase option can only occur with the use of credit. It is possible that price disclosure methods can impact gift card demand differentially across credit cost priors when participants are "credit-only purchasers." This is because their decision to purchase a gift card hinges on their belief of credit costs. However, we have shown in previous results that those who overreact to non-salient prices tend to be "always-purchasers" not "credit-only purchasers." Unlike "credit-only purchasers," "always-purchasers" purchase the good regardless of credit price either through "savings" or through "credit." Hence, we should not see disclosure method impact gift card demand.
outcomes, disclosure methods do not affect these non-credit reliant outcomes differentially across proxies of credit costs, strengthening evidence that these proxies capture priors of credit costs. Altogether these results support a story that those who hold prior beliefs that credit is expensive overreact to cheap credit when prices are not salient. However, these same individuals update their prior beliefs of credit costs when prices are more salient. Throughout the experiment we observe that this updating that averts overreaction occurs when prices are in dollar terms or when prices have values that require little processing to comprehend (i.e., 0% APR). These findings conform very well with costly attention models that have default beliefs playing major roles in their main framework such as in the sparsity-based model of Gabaix (2014) and the heuristic model of Morrison and Taubinsky (2020).

F. Optional Add-on vs. Mandatory Surcharge

Most non-salient prices that are studied empirically are associated with mandatory surcharges rather than optional add-ons. It is possible that consumers tend to overlook costs that are less salient if they are not required to explicitly decide to incur them, such as the case with surcharges like sales taxes. If this is true, then we should see that the percentage of participants in interest rate arms who do not pay attention to credit costs increase when the option to purchase through "savings" is removed. This is, again, because removing the "savings" purchase option is akin to converting credit from an optional add-on to a mandatory surcharge that must be incurred with every purchase. We see in Figure 5, Panels A and D, however, that the percentage of participants in interest rate arms who overlook credit costs when making the purchasing/borrowing decision remains essentially unchanged when the option to purchase through "savings" is removed.

It is also possible that consumers assume that non-salient surcharges must be reasonably priced when they are mandatory. Another possibility is that mental accounting has a higher likelihood of being applied to non-salient mandatory surcharges than salient charges and charges that are associated with optional add-ons. If either of these cases is true, we should see a disproportionate increase (decrease) in the percentage participants who believe credit is "cheap" ("expensive") among those in interest rate arms when the option to purchase through "savings" is removed. However the difference between the percent of participants who believe credit is differentially depending on credit cost priors of participants if indeed the proxy only captures credit cost priors.
"cheap" ("expensive") in the interest rate arm and those who believe credit is "cheap" ("expensive") in the dollar finance charge arm does not significantly change as the option to purchase through "savings" is removed (Figure 4, Panels B and E). Correspondingly, the magnitude of overreaction to non-salient prices does not diminish as the option to purchase through "savings" is removed (Compare the difference in means in Panel A to the difference in Panel C in Figure 4). Altogether, I find no evidence that credit being an optional add-on increases its likelihood of producing overreactions to non-salient prices as opposed to if it were a mandatory product feature.

One curious finding in this analysis is that, regardless of price disclosure method, consumers perceive mandatory surcharges to be cheaper than equivalently priced optional add-ons. As previously mentioned, participants in interest rate arms are 12 percentage points less likely to report that credit is "expensive" and 8 percentage points more likely to report that credit is "cheap" when the option to purchase through "savings" is removed (Figure 5, Panel E). Similarly, participants in dollar finance charge arms are 5 percentage points less likely to report that credit is "expensive" and 15 percentage points more likely to report that credit is "cheap" when the option to purchase through "savings" is removed (Figure 5, Panel E). Interestingly, this mandatory surcharge-induced "cheapening" occurs despite the number and appearance of listed prices (one for the base good and one for the credit instrument) remaining exactly the same with the removal of the option to purchase through "savings." In other words, making a price component mandatory for a purchase can cause price perceptions to change even if price presentation does not change. This finding is a bit of a departure from the pertinent marketing literature, to the best of this author's knowledge, as most relevant marketing strategies concurrently vary price presentation. Specifically, price partitioning of mandatory surcharges and bundling of goods are strategies that typically increase or reduce the number of listed prices presented to the consumer, respectively. But the isolated impact of switching from an optional add-on to a mandatory surcharge without switching price presentation from two prices to one has been less frequently studied.

4 Thought Processes Characterization in High Attention Cost Settings
Behaviors of participants across these two experiments can shed light on thought processes employed in high attention cost settings. Overall, participants' endeavors to produce responses can be characterized as frugal in terms of attention. First, the reliance on priors when making purchasing/borrowing decisions in high attention cost settings demonstrates the use of heuristics. Furthermore, it is expected that if consumers truly compute cost obligations of credit when making their purchasing/borrowing decision, then they would lower the quantity demanded for credit when credit prices dramatically increase. The fact that this does not occur when prices increase from 18% APR to 42% APR among those in interest rate arms but does among those in dollar finance charge arms (Figure 1, Panels A and B) further supports that heuristics are employed in high attention cost environments.

Second, several observed behaviors suggest that it is possible for the same participant to employ multiple heuristics within the same information environment and that these heuristics need not be correlated with each other even if they are prompted by incentive compatible mechanisms. Specifically, Table 6 Column 1 presents the results of regressing credit take-up among purchasers on whether a participant's calculation question response implies credit is free. We see that credit take-up of purchasers in the interest rate arm does not correlate with calculation question responses on credit cost obligations. That is, when attention costs are high, it is just as likely for somebody whose calculation question response implies credit is free to use credit in making their purchase as it is for somebody whose calculation question response implies that credit is costly. This lack of correlation suggests the use of orthogonal thought processes across these two tasks.

Further support for the idea that disparate thought processes are used by the same individual across tasks in interest rate disclosure arms comes from comparing the time spent on each task and determining the actual thought processes used. In Table 7, we see that those in interest rate arms spend on average 70 seconds more on the calculation question than they do on the purchasing/borrowing decision. In contrast, those in the dollar finance charge arm spend only 9 seconds more on the calculations question than on the purchasing/borrowing decision. Furthermore, the uncorrelated thought processes in the high attention cost settings seem to be

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25 This is perhaps akin to Simon's (1956) concept of satisficing.
26 Since this analysis is within participant rather than between participant and since the calculation question only asks about credit that is priced at 42% APR, this analysis is only conducted on arms that correspondingly offer credit priced at 42% APR in the purchasing/borrowing decision.
coming from the employment of two unrelated heuristics. We see in Figure 3, Panel A that calculation question responses for those in interest rate arms are concentrated at an incorrect and nonsensical value. Specifically, between 36 and 56% of those in interest rate arms respond with a value of "8 months" to the calculation question, a response that implies free credit.\textsuperscript{27} Why "8 months"? This value can be derived from the quotient of the most salient pieces of information in interest rate credit plans – the starting credit balance ($40) which is in dollars and minimum monthly repayment requirement ($5) which is also in dollars.\textsuperscript{28} Participants that are unwilling or unable to allocate further attention to the calculation question may settle on using this heuristic when prompted to produce an exact numerical response. While responses to the purchasing/borrowing decision seem to be driven by prior beliefs, responses to the credit cost calculation question seem to be mostly reliant on the incorporation of salient credit plan features as inputs with little consideration for prior beliefs. Hence, when attention costs are high, a person can utilize different heuristics within the same information environment to cheaply maneuver through different tasks. Incentive compatibility does not necessarily guarantee consistency of resulting responses produced by these task-dependent heuristics.

Third, thought processes when attention costs are low appear to be more correlated to each other than when attention costs are high. Returning to Table 6, we see in Column 2 that unlike in the case of interest rate price disclosures, credit take-up in the dollar finance charge arm is negatively correlated with estimated costs of credit. Specifically, credit take-up in the dollar finance charge arm is 26 percentage points less likely if a participant's calculation question response implies credit costs are positive. This consistency across tasks in the low attention-cost setting may be a result of participants employing the same thought processes across both tasks or of there being a higher degree of correlation between thought processes due to the influence of the salience of the price disclosure.

5 Conclusion

This paper demonstrates that consumers can significantly and consistently overreact to prices that are non-salient. This result is a departure from what is found in most empirical studies.

\textsuperscript{27} In contrast, only 14% of those in dollar finance charge arms respond with "8 months."
\textsuperscript{28} Interest rate disclosure terms that are in dollars include starting credit balance (i.e., $40) and minimum monthly repayment requirements (i.e., $5). Dollar finance charge disclosure terms that are in dollars include starting credit balance (i.e., $40), minimum monthly repayment requirements (i.e., $5) and the dollar finance charge (i.e., $7.77).
on non-salient prices. It augments the implications of non-salient prices on consumer and overall welfare. While those who underreact to non-salient prices lose consumer welfare by consuming goods at costs above their value, those who overreact to non-salient prices lose consumer welfare by forgoing or delaying consumption of goods whose costs are below their value. While underreaction to non-salient taxes can reduce inefficiency in cases where there are no income effects (Chetty, Looney and Kroft, 2009), corresponding overreaction to non-salient taxes will amplify deadweight loss.

The finding that interest rates, the standard price disclosures for credit, effectively obscure cost obligations from consumers has the greatest implications for credit instruments that only disclose interest rates at the time of loan initiation. With 44% of U.S. families holding credit card debt, according to the 2016 Survey of Consumer Finances, it is the most widely held type of debt among U.S. households (Bricker et al., 2017). Yet, the results of this paper imply that many of these households do not know how much it costs them to use this type of credit at loan origination. The 2009 Credit Card Accountability Responsibility and Disclosure (CARD) Act includes a measure to increase salience of credit card interest costs. It mandates the disclosure on credit card bills of hypothetical finance charges in dollar terms for two scenarios: 1) if only the minimum monthly requirement is paid each month on the outstanding balance and 2) if the outstanding balance is paid off in exactly 36 months. Though consumers can more saliently see how interest charges add up depending on how they repay their balances, they only see these CARD disclosures after they make their purchasing/borrowing decisions. Thus, this added disclosure will not mitigate over- or under-reactions as effectively as would a disclosure that appears at the time that the purchasing/borrowing decision is made.29

Historically, the results of this paper imply that the adoption of interest rate disclosures among retailers and the subsequent proliferation of bank credit cards correspond to a shift and deterioration in the comprehension of credit costs among consumers. Whereas research in financial literacy finds a non-trivial percentage of the population failing to evaluate compound

29 Furthermore, credit card customers who pay their bills and view their credit card activity online would need to open an electronic version of their paper statement in order to view the disclosure as it is not required to be displayed elsewhere. Agarwal, Chomsisengphet, Mahoney and Stroebel (2015) and Keys and Wang (2016) find that the 36-month payment disclosures create an anchoring effect. Keys and Wang present evidence that some consumers who were paying their balance in full each month end up paying the 36-month payment.
interest (see Lusardi and Mitchell, 2011, 2017; Lusardi and Tufano, 2015), the ability itself was not necessary to determine credit costs until price disclosures shifted towards interest rates.

The existence of both those who overreact and underreact to interest rate price disclosures can explain several of the unique market dynamics specific to credit cards. Credit card prices historically have been one of the stickiest among credit instruments. From the time the Federal Reserve Board started to collect data on credit card prices in the early 1970s up until the early 1990s, credit cards have had an average price of around 18% APR regardless of movements in the underlying cost of funds (Furletti, 2003). Economists have conjectured several drivers for this phenomenon including search costs, switching costs and adverse selection (Ausubel, 1991; Calem and Mester, 1995). With the identification of non-salience of interest rates, another possibility for the price stickiness emerges - shrouding. The under- and overreactors to non-salient prices can parallel the naive and sophisticated consumers in shrouding models of Gabaix and Laibson (2006) and Heidhues, Kőszegi, and Murooka (2017). Shrouding theory would predict that credit card prices be set to the highest possible price that would not illicit attention from consumers or regulators, such as usury ceilings (Heidhues, Kőszegi, and Murooka, 2017; Murooka and Zaki, 2020). Such an equilibrium would cause price stickiness if that upper bound of price is fairly stable over time. Furthermore, non-salience of interest rate disclosures even at very low but positive prices can explain why that when credit card issuers did eventually start to compete on prices in the early 1990s that there was a deluge of marketing offers concentrated at the introductory price of 0% APR. For example, in the third quarter of 2002, 37% of credit card mail offers included a 0% introductory rate for purchases, and 52% included a 0% introductory rate for balance transfers (Synovate, 2003).

There are signs that the credit industry is moving to capture the market of overreactors in ways other than price. There now exist several Financial Technology firms that have partnered with online retailers to offer customers credit purchasing options at known dollar finance charge terms.\textsuperscript{30} Furthermore, major credit card issuers such as American Express and Chase have started to offer customers the option to repay credit card purchases in installments at a price that is quoted as a fee in dollar terms (Carms, 2019).\textsuperscript{31} Interestingly, marketing materials for these credit card features voice contempt for less salient interest rate charges and promote the more salient

\textsuperscript{30} Examples of these firms include Affirm and Afterpay.

\textsuperscript{31} American Express's option is called the Pay it/Plan it feature and Chase's option is called My Chase Plan.
dollar charge. For example, American Express's promotional materials for their *Pay It Plan It* feature explicitly states, "Split up large purchases over time for a fixed monthly fee and no interest charges."\textsuperscript{32} 

I find that prior beliefs of credit costs play a major role in driving overreactions to non-salient prices in this setting. However, this does not mean that priors determine reactions in all high attention cost settings. Rather, I find that it is possible for people to employ multiple uncorrelated heuristics in the same information environment when attention costs are high. This highlights a potential pitfall for researchers. In the processes of eliciting beliefs, researchers can inadvertently prompt participants to engage in thought processes that are unrelated to the researcher's primary thought processes of interest. The threat of this "observer effect," however, seems to be greater in high attention cost settings than in low attention cost settings. This finding is distinct from those on participant misconceptions in experiments (Plott and Zeiler, 2005; Chou, McConnel, Nagel and Plott, 2008; Cason and Plott, 2014). In this literature, experiment participants have difficulty understanding the actual experiment task either by misunderstanding the choice set or the connection between choices and payoffs. These types of "game form recognition" issues are ruled out in the experiments of this paper as those in dollar finance charge arms (i.e., the arms with low attention costs) demonstrate consistent behaviors across tasks as well as verifiably correct responses to certain tasks. Inconsistencies in responses among those in interest rate arms, hence, cannot be due to misconceptions as the mechanisms in these arms are identical to those in dollar finance charge arms. Rather, what appear to be misconceptions or inconsistencies across experiment questions in interest rate arms are really the employment of uncorrelated heuristics in this high attention cost setting.

Finally, I find that significant overreaction to non-salient prices persists whether prices are associated with mandatory charges or optional add-ons. This rules out one possible reason for why overreaction to non-salient prices is detected in this paper's setting but not often in others. A narrower set of possibilities remains. First, consumer priors may vary across settings. It is possible that a greater percentage of consumers believe credit is expensive than that sales taxes are expensive. If this is the case, then it is less likely that an overreaction to non-salient prices will occur in the sales tax setting. Second, cost of attention may vary across settings. For example, it may require less effort to convert sales taxes into tax obligations than it does to

convert credit interest rates into credit cost obligations. If attention costs in sales tax settings are sufficiently low, then it is possible that those who fear high costs from sales taxes (and hence have the potential to overreact to them) are more likely to pay the attention costs to uncover tax obligations than their low prior counterparts. Indeed, Feldman and Ruffle, (2015) find that consumers can readily convert sales taxes into dollar tax obligations and naturally do so when goods are discounted by a percent rather than taxed. Furthermore, Taubinsky and Rees-Jones (2018, 2020) show that as taxes increase, consumers are more likely to expend attention to more accurately estimate tax obligations. Finally, researchers may be unable to detect overreaction to non-salient prices because they conduct their research in settings where equilibrium prices are already too high to allow the detection. As demonstrated in the first experiment, heterogeneity in responses to non-salient prices precludes the detection of overreactions at high prices. In fact, if the first experiment only contained credit plans priced at 42% APR, then I would only conclude an underreaction to non-salient prices aligning with other previous research. Which of these three possibilities play the most crucial roles in influencing responses to non-salient prices is left to future research.

References


Figure 1
Experiment 1 - Borrowing and Purchasing Decisions

Panel A: Percent Who Use Credit

Panel B: Percent Who Make a Purchase

Panel C: Conditional Amount Borrowed

Panel D: Conditional Amount Purchased

Panel E: Unconditional Amount Borrowed

Panel F: Unconditional Amount Purchased

Note: +, * and ** indicate a statistical difference at the 15%, 10% and 5% significance level, respectively, relative to estimate for dollar finance charge terms arm at the same price. Red ◆ and • markers indicate a statistical difference at the 10% significance level relative to estimate at 18% APR within the same credit disclosure method. Skippers are excluded.
Figure 2
Experiment 1 - Composition of Purchasers

Panel A: Interest Rate - Base

Panel B: Interest Rate - APR

Panel C: Interest Rate - Focus-on

Panel D: Dollar Finance Charge

Note: Skippers are excluded.
Figure 3
Experiment 1 - Calculation Question

Panel A: Calculation Responses

Note: The correct response to the calculation question is 10 months, which is designated by the red bar. 8 months, designated by the black bar, would indicate a calculation in which there is 0 cost to using credit. Skippers are excluded.

Panel B: Average Time Spent on Question

Panel C: Average Time Spent on Question by Response Accuracy

Note: Bands in Panel B represent 95% confidence intervals around estimate of mean. Skippers are excluded.
Figure 4
Experiment 2 - Borrowing and Purchasing Decisions (pooled arms)

Panel A: Percent of Participants Who Use Credit, Two Purchase Options

Panel B: Percent of Participants Who Make a Purchase, Two Purchase Options

Panel C: Percent of Participants Who Use Credit, Only "Credit" Purchasing Available

Note: Bands in panels represent 95% confidence intervals around estimate of mean. Skippers are excluded.
Figure 5
Experiment 2 - Thoughts Concerning Credit Cost in Borrowing Decision

Panel A: All Responses, Two Purchase Options
Panel D: All Responses, Only "Credit" Purchasing Available

Panel B: Strong Beliefs Towards Credit Cost, Two Purchase Options
Panel E: Strong Beliefs Towards Credit Cost, Only "Credit" Purchasing Available

Panel C: Uncertain Beliefs Towards Credit Cost, Two Purchase Options
Panel F: Uncertain Beliefs Towards Credit Cost, Only "Credit" Purchasing Available

Note: Skippers are excluded.
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Table 2
Experiment 1 - Borrowing and Purchasing Decisions - Extensive Margin

Panel A: Percent of Participants Who Use Credit

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Panel B: Percent of Participants Who Make a Purchase

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Note: +, *, ** and *** indicate a statistical difference at the 15%, 10%, 5% and 1% significance level respectively. Omitted variable is Interest Rate arm (pooled).
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Note: +, *, ** and *** indicate a statistical difference at the 15%, 10%, 5% and 1% significance level respectively. Omitted variable is Interest Rate arm (pooled). Columns 1-4 look at arms where both purchasing options are available. Columns 5-6 look at arms where the option to purchase through "savings" is not available.
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<td>-0.17***</td>
<td>0.09</td>
<td>-0.21**</td>
<td>0.07</td>
<td>-0.38***</td>
<td>-0.29**</td>
</tr>
<tr>
<td></td>
<td>(0.07)</td>
<td>(0.10)</td>
<td>(0.10)</td>
<td>(0.13)</td>
<td>(0.09)</td>
<td>(0.12)</td>
</tr>
<tr>
<td><strong>Believe Experiment Credit Average cost</strong></td>
<td>-0.05</td>
<td>-0.00</td>
<td>-0.04</td>
<td>0.10</td>
<td>0.04</td>
<td>0.08</td>
</tr>
<tr>
<td></td>
<td>(0.08)</td>
<td>(0.09)</td>
<td>(0.12)</td>
<td>(0.14)</td>
<td>(0.10)</td>
<td>(0.09)</td>
</tr>
<tr>
<td><strong>Believe Experiment Credit Cheap</strong></td>
<td>0.08</td>
<td>0.38***</td>
<td>0.14</td>
<td>0.32***</td>
<td>0.35***</td>
<td>0.30***</td>
</tr>
<tr>
<td></td>
<td>(0.13)</td>
<td>(0.09)</td>
<td>(0.19)</td>
<td>(0.11)</td>
<td>(0.11)</td>
<td>(0.08)</td>
</tr>
<tr>
<td><strong>Unsure about Experiment Credit Cost</strong></td>
<td>-0.09</td>
<td>-0.09</td>
<td>-0.09</td>
<td>-0.14</td>
<td>-0.14*</td>
<td>-0.09</td>
</tr>
<tr>
<td></td>
<td>(0.07)</td>
<td>(0.08)</td>
<td>(0.10)</td>
<td>(0.12)</td>
<td>(0.09)</td>
<td>(0.09)</td>
</tr>
<tr>
<td><strong>Constant</strong></td>
<td>0.25***</td>
<td>0.24***</td>
<td>0.36***</td>
<td>0.40***</td>
<td>0.58***</td>
<td>0.57***</td>
</tr>
<tr>
<td></td>
<td>(0.05)</td>
<td>(0.05)</td>
<td>(0.07)</td>
<td>(0.07)</td>
<td>(0.07)</td>
<td>(0.06)</td>
</tr>
</tbody>
</table>

|                | N     | 223   | 226   | 139   | 145   | 225   |
| **Purchasing Options** | 2     | 2     | 2     | 2     | 1     | 1     |

Note: +, *, ** and *** indicate a statistical difference at the 15%, 10%, 5% and 1% significance level respectively. Columns 1-4 look at arms where both purchasing options are available. Columns 5-6 look at arms where the option to purchase through “savings” is not available. The outcome variable in Columns 1,2, 5 and 6 is credit use. The outcome variable in Columns 3 and 4 is credit use only among gift card purchasers. Omitted Variable is those who do not think about credit costs when making the purchasing/borrowing decision. Skippers are excluded.
Table 5
Experiment 2 - Relationship Between Those who Report Own Credit Expensive or who have Negative Opinions towards Credit and Experiment Behavior/Perceptions

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Exp.</td>
<td>Exp.</td>
<td>Exp.</td>
<td>Exp.</td>
<td>Exp.</td>
</tr>
<tr>
<td></td>
<td>Credit</td>
<td>Credit</td>
<td>Credit</td>
<td>Giftcard</td>
<td>Giftcard</td>
</tr>
<tr>
<td></td>
<td>Demand</td>
<td>&quot;Valuable&quot;</td>
<td>&quot;Expensive&quot;</td>
<td>Demand</td>
<td>&quot;Attractive&quot;</td>
</tr>
<tr>
<td>Expensive prior</td>
<td>-0.13***</td>
<td>-0.13***</td>
<td>0.21***</td>
<td>0.08</td>
<td>-0.01</td>
</tr>
<tr>
<td></td>
<td>(0.04)</td>
<td>(0.04)</td>
<td>(0.04)</td>
<td>(0.06)</td>
<td>(0.04)</td>
</tr>
<tr>
<td>Dollar Charge</td>
<td>0.04</td>
<td>0.01</td>
<td>-0.11***</td>
<td>-0.04</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>(0.04)</td>
<td>(0.04)</td>
<td>(0.04)</td>
<td>(0.07)</td>
<td>(0.04)</td>
</tr>
<tr>
<td>Expensive prior x Dollar Charge</td>
<td>0.18***</td>
<td>0.14**</td>
<td>-0.15***</td>
<td>0.10</td>
<td>0.06</td>
</tr>
<tr>
<td></td>
<td>(0.06)</td>
<td>(0.06)</td>
<td>(0.06)</td>
<td>(0.09)</td>
<td>(0.05)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.58***</td>
<td>0.75***</td>
<td>0.18***</td>
<td>0.58***</td>
<td>0.78***</td>
</tr>
<tr>
<td></td>
<td>(0.03)</td>
<td>(0.04)</td>
<td>(0.03)</td>
<td>(0.05)</td>
<td>(0.03)</td>
</tr>
<tr>
<td>N</td>
<td>892</td>
<td>892</td>
<td>892</td>
<td>445</td>
<td>892</td>
</tr>
<tr>
<td>Experiment Arms</td>
<td>All</td>
<td>All</td>
<td>All</td>
<td>All</td>
<td>Arms that allow purchasing through &quot;savings&quot;</td>
</tr>
</tbody>
</table>

Note: +, *, ** and *** indicate a statistical difference at the 15%, 10%, 5% and 1% significance level respectively. Skippers are excluded. "Expensive prior" is an indicator variable that is equal to 1 if participants indicate that own credit is "Expensive" or if their view of credit on the market is "Negative." Regressions in Columns 1, 2, 3 and 5 include a control for availability of the option to purchase through "savings."
### Table 6

**Experiment 1 - Credit use among Purchasers of Gift card by Calculation Question Response**

When Credit Price is 42% APR

<table>
<thead>
<tr>
<th>Calculation Response:</th>
<th>(1) Interest Rate</th>
<th>(2) Dollar Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 8 months</td>
<td>0.03</td>
<td>-0.28*</td>
</tr>
<tr>
<td></td>
<td>(0.06)</td>
<td>(0.14)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.31***</td>
<td>0.54***</td>
</tr>
<tr>
<td></td>
<td>(0.04)</td>
<td>(0.13)</td>
</tr>
</tbody>
</table>

\[ N = 235 \] \[ N = 70 \]

Note: +, *, ** and *** indicate a statistical difference at the 15%, 10%, 5% and 1% significance level respectively. Omitted variable is those whose response to calculation question is 8 months or less, which implies free credit. Skippers are excluded.

### Table 7

**Experiment 1 - Time (in seconds) Spent on Survey Tasks When Credit Price is 42% APR**

<table>
<thead>
<tr>
<th></th>
<th>(1) Purchase Decision</th>
<th>(2) Calculation Question</th>
<th>(3) Between Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dollar Charge</td>
<td>2.56</td>
<td>-58.41***</td>
<td>-60.97***</td>
</tr>
<tr>
<td></td>
<td>(4.25)</td>
<td>(15.18)</td>
<td>(15.01)</td>
</tr>
<tr>
<td>Constant</td>
<td>42.52***</td>
<td>112.30***</td>
<td>69.77***</td>
</tr>
<tr>
<td></td>
<td>(2.16)</td>
<td>(7.70)</td>
<td>(7.62)</td>
</tr>
</tbody>
</table>

\[ N = 439 \] \[ N = 439 \] \[ N = 439 \]

Note: +, *, ** and *** indicate a statistical difference at the 15%, 10%, 5% and 1% significance level respectively. Omitted variable is Interest Rate arm (pooled). Skippers are excluded.
Appendix Figure A.1
Historical Examples of Credit Terms from Retailers

Panel A: Dollar Finance Charge

Panel B: Interest Rate (MPR)

Panel C: Interest Rate Terms (APR)

Source: Spiegel 1962 Fall/Winter Catalog.

Source: Spiegel 1956 Spring/Summer Catalog.

Source: Spiegel 1969 Fall/Winter Catalog.
Appendix Figure A.2
Experiment 1 - Borrowing and Purchasing Decisions - By Detailed Arm

Panel A: Percent of Participants Who Use Credit

Panel B: Percent of Participants Who Make a Purchase

Note: +, *, and ** indicate a statistical difference at the 15%, 10%, and 5% significance level respectively, relative to estimate for dollar finance charge terms arm at the same price. Yellow markers indicate a statistical difference at the 10% significance level between estimate and corresponding estimate for the arm with the same quoting method priced at 18% APR. Skippers are excluded.
Appendix Figure A.3
Experiment 2 - Borrowing and Purchasing Decisions

Panel A: Percent of Participants Who Use Credit, Two Purchase Options

Panel B: Percent of Participants Who Make a Purchase, Two Purchase Options

Panel C: Percent of Participants Who Use Credit, Only "Credit" Purchasing Available

Note: Bands represent 95% confidence intervals around estimate of mean. Skippers are excluded.
### Appendix Table A.1 - Experiment 2 Balance

#### Two Purchase Options

<table>
<thead>
<tr>
<th>Age</th>
<th>Interest Rate</th>
<th>Dollar Charge</th>
<th>Diff.</th>
<th>S.E.</th>
<th>Interest Rate</th>
<th>Dollar Charge</th>
<th>Diff.</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>35.48</td>
<td>35.87</td>
<td>-0.39</td>
<td>(0.94)</td>
<td>36.90</td>
<td>36.22</td>
<td>0.67</td>
<td>(0.97)</td>
</tr>
<tr>
<td>Female</td>
<td>0.38</td>
<td>0.36</td>
<td>0.01</td>
<td>(0.04)</td>
<td>0.36</td>
<td>0.35</td>
<td>0.01</td>
<td>(0.04)</td>
</tr>
</tbody>
</table>

#### Race

<table>
<thead>
<tr>
<th>Race</th>
<th>Interest Rate</th>
<th>Dollar Charge</th>
<th>Diff.</th>
<th>S.E.</th>
<th>Interest Rate</th>
<th>Dollar Charge</th>
<th>Diff.</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>White/Caucasian</td>
<td>0.64</td>
<td>0.67</td>
<td>-0.03</td>
<td>(0.04)</td>
<td>0.66</td>
<td>0.65</td>
<td>0.02</td>
<td>(0.04)</td>
</tr>
<tr>
<td>Black or African American</td>
<td>0.24</td>
<td>0.19</td>
<td>0.05</td>
<td>(0.04)</td>
<td>0.17</td>
<td>0.15</td>
<td>0.02</td>
<td>(0.03)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>0.06</td>
<td>0.09</td>
<td>-0.03</td>
<td>(0.02)</td>
<td>0.06</td>
<td>0.07</td>
<td>-0.02</td>
<td>(0.02)</td>
</tr>
<tr>
<td>Asian/Pacific Islander</td>
<td>0.05</td>
<td>0.04</td>
<td>0.01</td>
<td>(0.02)</td>
<td>0.08</td>
<td>0.07</td>
<td>0.01</td>
<td>(0.02)</td>
</tr>
</tbody>
</table>

#### Previous Year's Household Income

<table>
<thead>
<tr>
<th>Income Range</th>
<th>Interest Rate</th>
<th>Dollar Charge</th>
<th>Diff.</th>
<th>S.E.</th>
<th>Interest Rate</th>
<th>Dollar Charge</th>
<th>Diff.</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0 - $10K</td>
<td>0.03</td>
<td>0.01</td>
<td>0.02</td>
<td>(0.01)</td>
<td>0.03</td>
<td>0.02</td>
<td>0.01</td>
<td>(0.01)</td>
</tr>
<tr>
<td>$10K - $30K</td>
<td>0.16</td>
<td>0.18</td>
<td>-0.03</td>
<td>(0.03)</td>
<td>0.16</td>
<td>0.15</td>
<td>0.01</td>
<td>(0.03)</td>
</tr>
<tr>
<td>$30K - $50K</td>
<td>0.29</td>
<td>0.24</td>
<td>0.05</td>
<td>(0.04)</td>
<td>0.25</td>
<td>0.28</td>
<td>-0.03</td>
<td>(0.04)</td>
</tr>
<tr>
<td>$50K - $75K</td>
<td>0.31</td>
<td>0.32</td>
<td>-0.01</td>
<td>(0.04)</td>
<td>0.31</td>
<td>0.30</td>
<td>0.02</td>
<td>(0.04)</td>
</tr>
<tr>
<td>$75K - $100K</td>
<td>0.11</td>
<td>0.14</td>
<td>-0.03</td>
<td>(0.03)</td>
<td>0.12</td>
<td>0.12</td>
<td>-0.01</td>
<td>(0.03)</td>
</tr>
<tr>
<td>$100K or more</td>
<td>0.09</td>
<td>0.10</td>
<td>-0.01</td>
<td>(0.03)</td>
<td>0.13</td>
<td>0.13</td>
<td>-0.00</td>
<td>(0.03)</td>
</tr>
</tbody>
</table>

#### Highest Education Level

<table>
<thead>
<tr>
<th>Education Level</th>
<th>Interest Rate</th>
<th>Dollar Charge</th>
<th>Diff.</th>
<th>S.E.</th>
<th>Interest Rate</th>
<th>Dollar Charge</th>
<th>Diff.</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Some High school (No diploma)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>(0.00)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>(0.00)</td>
</tr>
<tr>
<td>High school graduate (with diploma or GED certificate)</td>
<td>0.07</td>
<td>0.10</td>
<td>-0.03</td>
<td>(0.02)</td>
<td>0.08</td>
<td>0.06</td>
<td>0.01</td>
<td>(0.02)</td>
</tr>
<tr>
<td>Some college no degree</td>
<td>0.18</td>
<td>0.17</td>
<td>0.01</td>
<td>(0.03)</td>
<td>0.14</td>
<td>0.16</td>
<td>-0.02</td>
<td>(0.03)</td>
</tr>
<tr>
<td>Two-year associate degree from a college or university</td>
<td>0.06</td>
<td>0.10</td>
<td>-0.04</td>
<td>(0.02)</td>
<td>0.11</td>
<td>0.07</td>
<td>0.03</td>
<td>(0.02)</td>
</tr>
<tr>
<td>Four year college or university degree/Bachelor's degree</td>
<td>0.54</td>
<td>0.46</td>
<td>0.08</td>
<td>(0.04)</td>
<td>0.51</td>
<td>0.49</td>
<td>0.02</td>
<td>(0.04)</td>
</tr>
<tr>
<td>Some postgraduate or professional schooling (no degree)</td>
<td>0.02</td>
<td>0.03</td>
<td>-0.01</td>
<td>(0.01)</td>
<td>0.02</td>
<td>0.03</td>
<td>-0.02</td>
<td>(0.01)</td>
</tr>
<tr>
<td>Postgraduate or professional degree</td>
<td>0.12</td>
<td>0.14</td>
<td>-0.02</td>
<td>(0.03)</td>
<td>0.15</td>
<td>0.19</td>
<td>-0.04</td>
<td>(0.03)</td>
</tr>
<tr>
<td>Credit Card</td>
<td>Has a credit card</td>
<td>Pay the credit card bill in full every month</td>
<td>Pay between the minimum and the full amount</td>
<td>Pay the minimum required payment</td>
<td>Debt Conditional on having a Credit Card</td>
<td>Credit Card Interest Rate</td>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-------------------</td>
<td>---------------------------------------------</td>
<td>---------------------------------------------</td>
<td>---------------------------------</td>
<td>----------------------------------------</td>
<td>---------------------------</td>
<td>-------------------------</td>
<td></td>
</tr>
<tr>
<td>Have a credit card</td>
<td>0.85</td>
<td>0.32</td>
<td>0.37</td>
<td>0.31</td>
<td>2083</td>
<td>Credit Card Interest Rate</td>
<td>Other</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.83</td>
<td>0.37</td>
<td>0.35</td>
<td>0.28</td>
<td>1986</td>
<td>0% APR</td>
<td>Skipper</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.03</td>
<td>-0.05</td>
<td>0.01</td>
<td>0.04</td>
<td>97.60</td>
<td>0.01% -10% APR</td>
<td>Own or Market Credit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.03)</td>
<td>(0.05)</td>
<td>(0.05)</td>
<td>(0.04)</td>
<td>(507)</td>
<td>10.01% -18% APR</td>
<td>&quot;Expensive&quot; or &quot;Negative&quot;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.82</td>
<td>0.36</td>
<td>0.40</td>
<td>0.24</td>
<td>2187</td>
<td>18.01% -24% APR</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.85</td>
<td>0.40</td>
<td>0.36</td>
<td>0.24</td>
<td>2316</td>
<td>&gt;36.01% -36% APR</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-0.03</td>
<td>-0.03</td>
<td>0.03</td>
<td>0.00</td>
<td>-128</td>
<td>&gt;=36.01% APR</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.03)</td>
<td>(0.05)</td>
<td>(0.05)</td>
<td>(0.04)</td>
<td>(484)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Appendix Table A.1 (cont)***

**Credit Card Interest Rate**

- **0% APR**
  - 0.01
  - 0.00
  - 0.01
  - 0.01
  - 0.02
  - 0.00
  - 0.02
  - (0.01)

- **0.01% - 10% APR**
  - 0.25
  - 0.18
  - 0.07
  - 0.04
  - 0.25
  - 0.22
  - 0.03
  - (0.04)

- **10.01% - 18% APR**
  - 0.27
  - 0.27
  - 0.00
  - 0.04
  - 0.25
  - 0.29
  - -0.04
  - (0.04)

- **18.01% - 24% APR**
  - 0.21
  - 0.21
  - 0.00
  - 0.04
  - 0.20
  - 0.19
  - 0.02
  - (0.04)

- **24.01% - 36% APR**
  - 0.09
  - 0.13
  - -0.04
  - 0.03
  - 0.13
  - 0.12
  - 0.01
  - (0.03)

- **> 36.01% APR**
  - 0.17
  - 0.21
  - -0.05
  - 0.04
  - 0.14
  - 0.19
  - -0.05
  - (0.04)

**Other**

- **Skipper**
  - 0.14
  - 0.13
  - 0.00
  - 0.03
  - 0.15
  - 0.15
  - 0.00
  - (0.03)

- **Own or Market Credit "Expensive" or "Negative"**
  - 0.51
  - 0.54
  - -0.03
  - 0.04
  - 0.52
  - 0.49
  - 0.04
  - (0.04)
### Appendix Table A.2 - Experiment 2 Credit Take-up Across Disclosure Method by Credit Cost Belief

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
<th>(9)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Uncertainty: Credit</td>
<td>Uncertainty: Credit/Purchase</td>
<td>Uncertainty: Credit</td>
<td>Stronger Belief: Credit</td>
<td>Stronger Belief: Credit/Purchase</td>
<td>Stronger Belief: Credit</td>
<td>No Attention: Credit</td>
<td>No Attention: Credit/Purchase</td>
<td>No Attention: Credit</td>
</tr>
<tr>
<td>Dollar Charge</td>
<td>-0.01 (0.07)</td>
<td>0.00 (0.11)</td>
<td>0.03 (0.10)</td>
<td>0.29*** (0.06)</td>
<td>0.38*** (0.08)</td>
<td>0.20*** (0.06)</td>
<td>-0.01 (0.08)</td>
<td>0.05 (0.11)</td>
<td>-0.00 (0.10)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.16*** (0.05)</td>
<td>0.26*** (0.08)</td>
<td>0.44*** (0.06)</td>
<td>0.13*** (0.04)</td>
<td>0.23*** (0.06)</td>
<td>0.53*** (0.04)</td>
<td>0.25*** (0.06)</td>
<td>0.36*** (0.08)</td>
<td>0.58*** (0.07)</td>
</tr>
<tr>
<td>N</td>
<td>106</td>
<td>64</td>
<td>101</td>
<td>218</td>
<td>139</td>
<td>250</td>
<td>125</td>
<td>81</td>
<td>98</td>
</tr>
<tr>
<td>Purchasing Options</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: Skippers are excluded. Columns 1, 2, 4, 5, 7 and 8 look at arms where both purchasing options are available. Columns 3, 6 and 9 look at arms where the option to purchase through "savings" is not available. The outcome variable in Columns 1, 3, 4, 6, 7 and 9 is credit use. The outcome variable in Columns 2, 5 and 8 is credit use only among gift card purchasers.
APPENDIX B: SURVEY DETAILS
Appendix Figure B.1
Experiment 1: Example of Question Page

You will receive $5 a month for 13 months with the first payment starting in one month.

You can use some of the money from your income stream to purchase one of these specially priced Amazon Gift Cards:

You can purchase and receive your desired Amazon Gift Card today by using a credit plan OR you can wait till you have enough money saved up from your income stream to purchase it later.

If you would like to receive the Amazon Gift Card today, you must use the following credit plan:

<table>
<thead>
<tr>
<th>Credit Balance</th>
<th>Credit Fee</th>
<th>Payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>$10.00</td>
<td>$0.00</td>
<td>$5</td>
</tr>
<tr>
<td>$20.00</td>
<td>$0.00</td>
<td>$5</td>
</tr>
<tr>
<td>$30.00</td>
<td>$0.00</td>
<td>$5</td>
</tr>
<tr>
<td>$40.00</td>
<td>$0.00</td>
<td>$5</td>
</tr>
<tr>
<td>$50.00</td>
<td>$0.00</td>
<td>$5</td>
</tr>
</tbody>
</table>

*These payments will be automatically withdrawn from your income stream. If the remaining credit balance in any one month is less than the monthly payment, you will only pay the remaining balance from your income stream. The first withdrawal is in one month.

Which Amazon Gift Card would you like to purchase if any? Please select one choice below:

Not Interested in purchasing Amazon Gift Card at any time.

How would you like to make the purchase? Please select one choice below:

- SAVING: Receive Amazon Gift Card after saving up enough money to purchase it.
- CREDIT: Use credit plan and receive Amazon Gift Card today.
Appendix Figure B.2  
Experiment 1: 18% APR Credit Plans

Panel A: Dollar Finance Charge  
Panel B: Interest Rate – Base

<table>
<thead>
<tr>
<th>CREDIT PLAN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1:</strong> Look up the price of the Gift Card. This will be the Credit Balance in the first month.</td>
</tr>
<tr>
<td><strong>Step 2:</strong> Add the one-time service fee listed below to the PRICE of the Gift Card to calculate your starting Credit Balance.</td>
</tr>
<tr>
<td><strong>Step 3:</strong> Pay the amount listed below Every Month Until your credit balance is 0*.</td>
</tr>
<tr>
<td>$10.00</td>
</tr>
<tr>
<td>$20.00</td>
</tr>
<tr>
<td>$30.00</td>
</tr>
<tr>
<td>$40.00</td>
</tr>
<tr>
<td>$50.00</td>
</tr>
</tbody>
</table>

*These payments will be automatically withdrawn from your income stream. If the remaining credit balance in any one month is less than the monthly payment, you will only pay the remaining balance from your income stream. The first withdrawal starts in one month.

Panel C: Interest Rate – APR  
Panel D: Interest Rate – Focus On

<table>
<thead>
<tr>
<th>CREDIT PLAN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1:</strong> Look up the price of the Gift Card. This will be the Credit Balance in the first month.</td>
</tr>
<tr>
<td><strong>Step 2:</strong> Pay the amount listed below Every Month Until your Credit Balance is 0*.</td>
</tr>
<tr>
<td>$10.00</td>
</tr>
<tr>
<td>$20.00</td>
</tr>
<tr>
<td>$30.00</td>
</tr>
<tr>
<td>$40.00</td>
</tr>
<tr>
<td>$50.00</td>
</tr>
</tbody>
</table>

*These payments will be automatically withdrawn from your income stream. The CREDIT BALANCE in each subsequent month after the first month is calculated by first adding a service fee of 1.5% of the previous month’s credit balance (18% Annual Percentage Rate (APR)) to the previous month’s credit balance and then subtracting the monthly withdrawal amount (listed in the second column of the table above). If the summation of the previous month’s credit balance plus the service fee is smaller than the monthly withdrawal amount, then only the previous month’s credit balance plus the service fee will be withdrawn. The first withdrawal starts in one month.
Appendix Figure B.3
Experiment 1: Calculation Question (Dollar Finance Charge Version)

Assume that you will be receiving $5 for 13 months with your first payment starting in one month.

If you are interested in purchasing the following Amazon Gift Card:

![Amazon Gift Card](image)

and you are planning to purchase it using the following credit plan:

<table>
<thead>
<tr>
<th>Credit Plan Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1: Look up the price of the Gift Card</strong></td>
</tr>
<tr>
<td><strong>$10.00</strong></td>
</tr>
<tr>
<td><strong>$20.00</strong></td>
</tr>
<tr>
<td><strong>$30.00</strong></td>
</tr>
<tr>
<td><strong>$40.00</strong></td>
</tr>
<tr>
<td><strong>$50.00</strong></td>
</tr>
</tbody>
</table>

*These payments will be automatically withdrawn from your income stream. If the remaining credit balance in any one month is less than the monthly payment, you will only pay the remaining balance from your income stream. The first withdrawal starts in one month.*

then how many months will it take you to pay off your credit balance? For example, if your credit balance will be equal to 0 in one month from today, then your answer is "1". Please type your response in the box below:
Appendix Figure B.4

Experiment 2: Example of Question Page with Credit Optional with Purchase

You will receive $5 a month for 3 months with the first payment starting in one month.

You can use some of the money from your income stream to purchase this specially priced Amazon Gift Card:

You can purchase and receive this Amazon Gift Card today by using a credit plan OR you can wait till you have enough money saved up from your income stream to purchase it later.

If you would like to receive the Amazon Gift Card today, you must use the following credit plan:

![Credit Plan Table]

Would you like to purchase the Amazon Gift Card? Please select one choice below:

- Not interested in purchasing Amazon Gift Card.
- Do Not Purchase Gift Card.
- Purchase Gift Card.

How would you like to make the purchase? Please select one choice below:

- CREDIT: Use credit plan and receive Amazon Gift Card today.
- SAVING: Receive Amazon Gift Card after saving up enough money to purchase.
Appendix Figure B.5
Experiment 2: Example of Question Page with Credit Mandatory with Purchase

*You will receive $5 a month for 3 months with the first payment starting in one month.*

You can use some of the money from your income stream to purchase this specially priced Amazon Gift Card:

![Amazon Gift Card]

*If you would like to purchase the Amazon Gift Card and receive it today, you must use the following credit plan:*

<table>
<thead>
<tr>
<th>CREDIT PLAN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Credit Cost</strong></td>
</tr>
</tbody>
</table>

**Directions:**
Add the one-time credit cost listed above to the price of the gift card ($10) to calculate your starting credit balance. You will automatically pay down this credit balance with your monthly income stream until your credit balance is reduced to 0. Once the credit balance is equal to 0, you will receive any remaining income stream payments.

*Would you like to purchase the Amazon Gift Card and receive it today? Please select one choice below:*

- [ ] Not interested in purchasing Amazon Gift Card.
- [ ] Do Not Purchase Gift Card.
- [ ] Purchase with Credit Plan and receive today.
## Appendix Figure B.6
### Experiment 2: Credit Plans

#### Panel A: Interest Rate – APR

<table>
<thead>
<tr>
<th>CREDIT PLAN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Credit Cost</strong></td>
</tr>
</tbody>
</table>

*Directions*

Your starting credit balance is the price of the gift card ($10). Every month, starting in a month, an interest charge of 0.25% of the previous month’s ending credit balance will be added to the credit balance (this is equivalent to a 3% Annual Percentage rate (APR)). You will automatically pay down this credit balance with your monthly income stream until your credit balance is reduced to 0. Once the credit balance is equal to 0, you will receive any remaining income stream payments.

#### Panel B: Interest Rate – MPR

<table>
<thead>
<tr>
<th>CREDIT PLAN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Credit Cost</strong></td>
</tr>
</tbody>
</table>

*Directions*

Your starting credit balance is the price of the gift card ($10). Every month, starting in a month, an interest charge of 0.25% of the previous month’s ending credit balance will be added to the credit balance. You will automatically pay down this credit balance with your monthly income stream until your credit balance is reduced to 0. Once the credit balance is equal to 0, you will receive any remaining income stream payments.

#### Panel C: Dollar Finance Charge

<table>
<thead>
<tr>
<th>CREDIT PLAN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Credit Cost</strong></td>
</tr>
</tbody>
</table>

*Directions*

Add the one-time credit cost listed above to the price of the gift card ($10) to calculate your starting credit balance. You will automatically pay down this credit balance with your monthly income stream until your credit balance is reduced to 0. Once the credit balance is equal to 0, you will receive any remaining income stream payments.

#### Panel D: Dollar Finance Charge – APR

<table>
<thead>
<tr>
<th>CREDIT PLAN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Credit Cost</strong></td>
</tr>
</tbody>
</table>

*Directions*

Add the one-time credit cost listed above to the price of the gift card ($10) to calculate your starting credit balance. You will automatically pay down this credit balance with your monthly income stream until your credit balance is reduced to 0. Once the credit balance is equal to 0, you will receive any remaining income stream payments. The cost of this plan is equivalent to a 3% Annual Percentage rate (APR).
Appendix Figure B.7
Experiment 2: Survey Question - Credit Specifically in Purchasing/Borrowing Decision

When making your purchasing/borrowing decision in this study, how did you feel about the **price** of the credit plan? Choose the option that best describes how you felt or thought about credit plan **price**.

- Made decision without thinking about credit cost too much
- Unsure, but worried it would be expensive
- Unsure, but assumed it would be a reasonable cost
- Unsure, but assumed it would be a small cost
- Unsure, could be cheap or could be expensive, no solid stance
- simply felt it was expensive
- simply felt it was an average cost
- simply felt it was cheap
In your own life, how do you feel about the price of credit that you are able to obtain?

- It is expensive
- It is an average/reasonable
- It is low/cheap
- Not sure

Think about credit offered to people in general, and not necessarily you. What are your feelings towards credit generally offered in the marketplace?

- Positive
- Neutral
- Negative
# Appendix Table B.1

Experiment 1: Crosswalk between Interest Rate Charge and Dollar Finance Charge

<table>
<thead>
<tr>
<th>Price of Gift Card (A)</th>
<th>Value of Gift Card (B)</th>
<th>0% MPR/0% APR (C)</th>
<th>1.5% MPR/18% APR (D)</th>
<th>3.5% MPR/42% APR (E)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$10</td>
<td>$12.50</td>
<td>$0</td>
<td>$0.23</td>
<td>$0.56</td>
</tr>
<tr>
<td>$20</td>
<td>$25.00</td>
<td>$0</td>
<td>$0.78</td>
<td>$1.94</td>
</tr>
<tr>
<td>$30</td>
<td>$37.00</td>
<td>$0</td>
<td>$1.68</td>
<td>$4.27</td>
</tr>
<tr>
<td>$40</td>
<td>$50.00</td>
<td>$0</td>
<td>$2.94</td>
<td>$7.77</td>
</tr>
<tr>
<td>$50</td>
<td>$62.50</td>
<td>$0</td>
<td>$4.58</td>
<td>$12.63</td>
</tr>
</tbody>
</table>