HOW DO MANDATED DISCLOSURES INFLUENCE CHOICE?

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Abstract:

Regulators of financial markets mandate the disclosure of key terms on loan products (here, credit cards) in summary tables prior to lending agreements with prospective borrowers. On banking websites, these tables are often only displayed until after the individual has already selected a card to apply for. We proposed that improved access to mandated disclosures during the shopping and product comparison process is a double-edged sword. Using clickstream data from an incentive-compatible study featuring a realistic replica banking website (N = 1,923), we find that when disclosures are made easier to access earlier in the decision process, individuals pay more attention to them. This leads to better choices when the disclosed information is relevant to the individual and worse ones otherwise. This research contributes to our understanding of whether and when providing individuals with improved access to mandated disclosures aids choice, and when it may backfire. It also highlights the important of documenting heterogeneity across individuals to understand when policy changes might have the intended effect of improving decisions, and when we might observe a complete reversal.

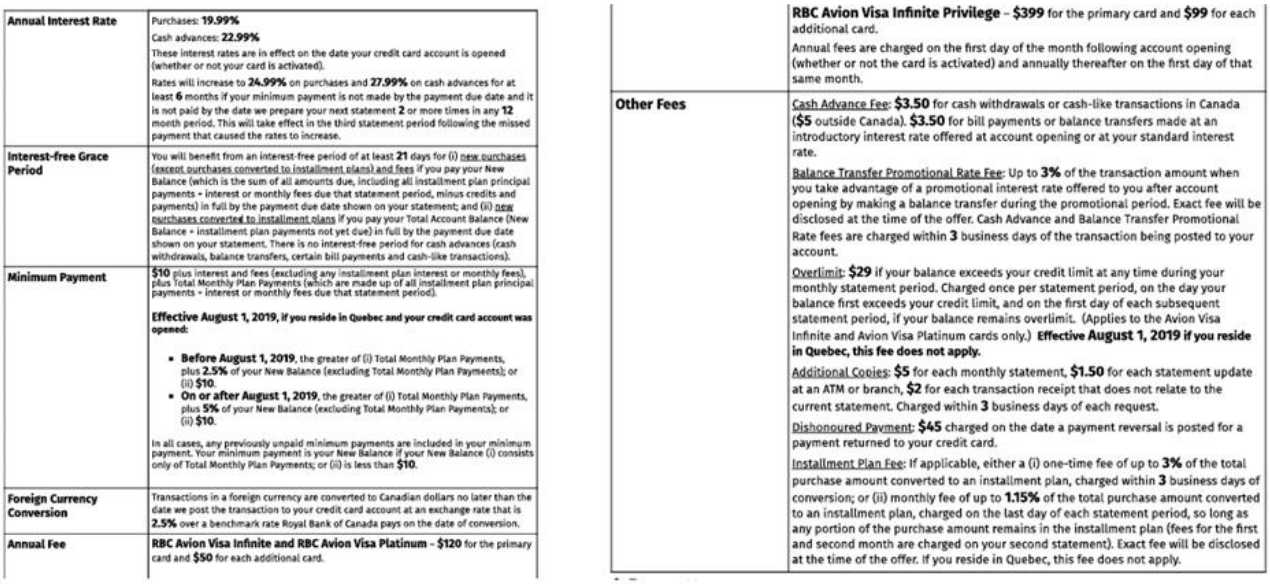
Key words: financial decision-making, mandated disclosures, attention, consumer search, heterogeneity, information

In many different domains, regulators mandate the disclosure of important information to individuals to help ensure that they are able to make informed choices. One such context is loan products. Federal regulators require that credit providers disclose key costs and rates to prospective borrowers. The *Truth in Lending Act (TILA)* in the United States, for example, requires creditors to provide "meaningful disclosure of credit terms" (costs of using credit cards) in summary table *at some point* before the borrower signs the final cardholder agreement (Dept. of Finance 2009). These summary tables go by different names in different jurisdictions but are usually called *Schumer Boxes* in the United States and *Information Boxes* in Canada (see **Figure 1)**. To further highlight information deemed to be of particular importance, the act also requires that some terms on the loan, like the Annual Percentage Rate (APR), be displayed more saliently within these Information Boxes. Mandated disclosures exist to protect individuals, promote informed credit use, and ensure that prospective borrowers have access to cost information so that they can comparison shop for different credit products (Office of the Comptroller of the Currency 2019; Consumer Financial Protection Bureau 2024).

The literature, however, suggests that mandated disclosures may not always have the desired impact on consumer decision-making (Ben-Shaher & Schneider 2011; Willis 2006). Some research has begun to empirically demonstrate the effect of highlighting key terms within disclosures (Braunsberger, Lucas, & Roach 2004, 2005; Hilchey, Osborne, & Soman 2021). But while there is no doubt that visually salient information *within* information disclosures is weighted more heavily by individuals, it is also judicious to consider *when*, during the product search process, key information should be made readily available to borrowers. We therefore ask here: does it help if individuals have ready access to information disclosures (e.g., Information Boxes) while they are shopping, or is it sufficient to provide ready access after they have chosen

a product (e.g., after beginning an application process for a loan product – which is the current status quo employed by banking websites)? We show that making disclosures easier to access during product search is a double-edged sword: they draw attention away from other product information, which helps or hinders decision-making depending on its relevance to the individual. We first provide additional background, then describe our experimental approach to answering the question and main results, whereupon we conclude with a discussion on implications, limitations, and future research directions.

Figure 1. *Example of a Canadian Information Box*



Annual Interest Rate	Purchases: **19.99%** Cash advances: **22.99%** These interest rates are in effect on the date your credit card account is opened (whether or not your card is activated). Rates will increase to **24.99%** on purchases and **27.99%** on cash advances for at least **6** months if your minimum payment is not made by the payment due date and it is not paid by the date we prepare your next statement **2** or more times in any **12** month period. This will take effect in the third statement period following the missed payment that caused the rates to increase.
Interest-free Grace Period	You will benefit from an interest-free period of at least **21** days for (i) new purchases (except purchases converted to installment plans) and fees if you pay your New Balance (which is the sum of all amounts due, including all installment plan principal payments + interest or monthly fees due that statement period, minus credits and payments) in full by the payment due date shown on your statement; and (ii) new purchases converted to installment plans if you pay your Total Account Balance (New Balance + installment plan payments not yet due) in full by the payment due date shown on your statement. There is no interest-free period for cash advances (cash withdrawals, balance transfers, certain bill payments and cash-like transactions).
Minimum Payment	**$10** plus interest and fees (excluding any installment plan interest or monthly fees), plus Total Monthly Plan Payments (which are made up of all installment plan principal payments + interest or monthly fees due that statement period). **Effective August 1, 2019, if you reside in Quebec and your credit card account was opened:** • **Before August 1, 2019**, the greater of (i) Total Monthly Plan Payments, plus **2.5%** of your New Balance (excluding Total Monthly Plan Payments); or (ii) **$10**. • **On or after August 1, 2019**, the greater of (i) Total Monthly Plan Payments, plus **5%** of your New Balance (excluding Total Monthly Plan Payments); or (ii) **$10**. In all cases, any previously unpaid minimum payments are included in your minimum payment. Your minimum payment is your New Balance if your New Balance (i) consists only of Total Monthly Plan Payments; or (ii) is less than **$10**.
Foreign Currency Conversion	Transactions in a foreign currency are converted to Canadian dollars no later than the date we post the transaction to your credit card account at an exchange rate that is **2.5%** over a benchmark rate Royal Bank of Canada pays on the date of conversion.
Annual Fee	**RBC Avion Visa Infinite and RBC Avion Visa Platinum – $120** for the primary card and **$50** for each additional card.
	RBC Avion Visa Infinite Privilege – $399 for the primary card and **$99** for each additional card. Annual fees are charged on the first day of the month following account opening (whether or not the card is activated) and annually thereafter on the first day of that same month.
Other Fees	Cash Advance Fee: **$3.50** for cash withdrawals or cash-like transactions in Canada (**$5** outside Canada). **$3.50** for bill payments or balance transfers made at an introductory interest rate offered at account opening or at your standard interest rate. Balance Transfer Promotional Rate Fee: Up to **3%** of the transaction amount when you take advantage of a promotional interest rate offered to you after account opening by making a balance transfer during the promotional period. Exact fee will be disclosed at the time of the offer. Cash Advance and Balance Transfer Promotional Rate fees are charged within **3** business days of the transaction being posted to your account. Overlimit: **$29** if your balance exceeds your credit limit at any time during your monthly statement period. Charged once per statement period, on the day your balance first exceeds your credit limit, and on the first day of each subsequent statement period, if your balance remains overlimit. (Applies to the Avion Visa Infinite and Avion Visa Platinum cards only.) **Effective August 1, 2019 if you reside in Quebec, this fee does not apply.** Additional Copies: **$5** for each monthly statement, **$1.50** for each statement update at an ATM or branch, **$2** for each transaction receipt that does not relate to the current statement. Charged within **3** business days of each request. Dishonoured Payment: **$45** charged on the date a payment reversal is posted for a payment returned to your credit card. Installment Plan Fee: If applicable, either a (i) one-time fee of up to **3%** of the total purchase amount converted to an installment plan, charged within **3** business days of conversion; or (ii) monthly fee of up to **1.15%** of the total purchase amount converted to an installment plan, charged on the last day of each statement period, so long as any portion of the purchase amount remains in the installment plan (fees for the first and second month are charged on your second statement). Exact fee will be disclosed at the time of the offer. If you reside in Quebec, this fee does not apply.

Mandated Term Disclosures

Research has shown that individuals often engage in little overt search for information about products they are planning to purchase (Beales et al. 1981; Claxton, Fry, and Portis 1974), including credit products (Chang & Hanna 1992). Mandated disclosures are in part intended to help reduce the search and effort costs of acquiring important information (Willis 2006) which may help them better attend to it (Russo et al. 1986) and be able to price shop and compare

products in a more informed way (Consumer Financial Protection Bureau 2024; Ausubel 1991; Berlin & Mester 2003). Current regulations in Canada and the USA, however, do not specify when Information Boxes must be disclosed during borrowers' loan acquisition journeys. In online credit card markets, this latitude appears to have given rise to a widespread industry practice of making Information Boxes available only *after* individuals have already selected a credit card to apply for and *just prior to* their signing off on the cardholder agreement. It is therefore worthwhile to consider whether these information disclosures come at a point in the borrowers' decision process when they may not effectively influence choice anymore (Willis 2006; Ben-Shaher & Schneider 2011)

One reason why disclosures may be less effective when provided later in the decision process (e.g., after the individual has already selecting a card to apply for) is that at this point, the individual may already be mentally pre-committed to their choices. Since individuals may not independently seek out enough important information during the product search process, they may select an option that may be less optimal than if they had considered the information in the disclosures. However, at this point, the individual may already feel a sense of 'ownership' over this chosen product (Thaler 1980; Kahneman, Knetsch, & Thaler 1990). When provided with additional information about this product (i.e., in the Information Box), attention may be biased towards positive information that supports this choice over negative information that might suggest choosing a different product (Carmon & Ariely 2000; Nayakankuppam & Mishra 2005; Ashby, Dickert, & Glöckner 2023). This may result in individuals not processing the information within the disclosures that may shed negative light on their chosen product (e.g., high costs and interest rates).

Alternatively, given that individuals only have a finite amount of effort and attention that they either are motivated to exert or have available for this task (Simon 1955; Caplin, Dean, & Martin 2011), they may lack the wherewithal and time to attend to this information, process it, and decide to abandon the product and start entirely afresh (Hilchey & Taylor 2020; Day 1976; Cude 2005; Simon 1990). Simply making the information readily available may not be enough if it comes at a point in the decision process when starting over and devoting more effort to information processing may be too costly (Russo et al. 1986).

As described by Willis (2006), disclosures are meant to provide consumers with information "at a time when they can use it". While there are various reasons for why late provision of information may cause disclosures to be less effective, the bottom line is that perhaps they may be more effective when readily available to individuals during the decision process. We therefore anticipate that providing ready access to Information Boxes each time a credit card product is advertised (as opposed to after a card has been selected) will allow for the information therein to have a greater impact on product comparison and choice.

Heterogeneity in Credit Card Users

In the domain of credit card choices, there is often a trade-off between risk and reward. For example, a card with a higher default rate typically also has a higher reward cashback percentage. There are also some notable differences amongst credit card users. Some consumers, particularly those under liquidity constraints, do not pay off their balances each month and thus incur interest charges. For these *revolvers*, low interest and default rates are important; they should almost always seek to minimize their costs of borrowing by identifying the lowest rates. Others, however, assiduously pay off their balances in full each month and mainly use the card for its convenience and rewards. For these *transactors*, terms such as cashback percentage on

purchases and annual fees are important, whereas interest rates are irrelevant, since they are not directly impacted by them.

On the one hand, revolvers with the foresight to know they may miss repayments should opt for cards that have low interest and default rates. On the other hand, transactors, for whom debt repayment is a non-issue, should seek premium rewards to maximize their returns from usage, irrespective of interest and default rates (see also Ausubel 1991).

Recently, research have begun to emphasize the importance of considering heterogeneity across individuals when creating, testing, and implementing policies and interventions (e.g., Shah et al. 2023, Soman and Hossain 2020). Evidently, there is clear heterogeneity on which terms of borrowing are important to whom. Thus, different types of credit card users should ultimately be comparing cards using different information when making credit card choices. Following this, when exploring the question of whether ready access to mandated disclosures may improve their effectiveness, it is important to consider for whom the information within them is relevant, and whether cost disclosures may be less effective for certain individuals. Specifically, for revolvers who incur interest on carried balances, the relevant terms for their decision are costs of borrowing which are outlined in the Information Boxes. Therefore, making mandated disclosures easier to access earlier in the search process should help make them more helpful to revolvers. However, when considering transactors, costs of borrowing are irrelevant to them since they pay off their balances monthly and thus do not incur any interest charges. Therefore, making Information Boxes and the cost information within them easier to access may have a reverse effect. For transactors, making irrelevant cost information more readily available may take attention away from more relevant information, such as cashback rewards. Paying attention to irrelevant information may lead them to select a card that may be best in terms of

cost, but that may likely be suboptimal on the more relevant reward dimensions. Thus, alongside asking whether ready access may make mandated disclosure more effective, we also ask whether it may help one type of credit card user (the revolver) while harming another (the transactor).

EXPERIMENT – CHOICE RESEARCH BANK

To test whether making Information Boxes more readily available earlier during consumers' credit card acquisition journeys makes them more effective, we created a website called *Choice Research Bank*. It was designed to replicate a typical Canadian bank website in look, feel, and style so that we could create incentive-compatible loan shopping experiments with a higher degree of realism, and presumably also external validity. In terms of internal validity, designing the website enabled us to exact full control over what information was shown to users under different hypothetical borrowing scenarios, so that we could closely monitor not only which credit card people ultimately chose, but also what they clicked on and for how long they were exposed to different types of information before making choices.

Participants & Exclusion criteria

This study was preregistered: https://osf.io/m6kxe/?view_only=105e786536234736a7e21042115bb5a3. While we ended up conducting a more comprehensive analysis than we originally intended, we abided by the preregistration for the sampling plan, as well as for the study design. 2,975 M-Turk participants (18+, Canada and US) were recruited. We had no prior data upon which to base our power analysis. Therefore, a decision was made that a target sample of 2000 participants would be large enough to detect reasonably small effects (0.2 changes in standard deviations) on continuous measurements and 10 percentage point shifts on binomial outcome measurements (assuming a

base rate of 50%) around 90% of the time. As preregistered, participants were excluded from all analyses if they did not (1) Apply for a credit card, (2) Answer the comprehension questions for the hypothetical scenario correctly on their first attempt, (3) Provide a relevant and original response to the essay question or (4) Click on at least one link on the credit card webpages before applying for a credit card. These exclusions were made in order from 1-4, respectively (see **Table 1**). The comprehension test consisted of 2 identical multiple-choice questions for both assigned scenarios: i) How much the user was going to charge per month to the card and ii) For how many months would the card be used. If a participant failed to answer both questions correctly on the first try, they were excluded from our data. Participants were excluded due to an inadequate essay response if it was a) left blank, b) gibberish, c) plagiarized, or d) completely off-topic to the question "Explain why you chose card ___". The purpose of these exclusions was to limit the data and analyses to participants who completed the experiment, understood their objective, and attempted to achieve that objective.

After these four pre-registered, stringent attention, effort, and comprehension checks, we were left with 1,923 participants who were randomly allocated into one of four conditions in a 2 (relevance of interest rates: relevant vs. irrelevant) x 2 (access to Information Box: easy vs. difficult) between-participants design. This was an acceptable post-exclusions sample size given our preregistration.

Table 1. Percentage of participants excluded in each condition for each reason: *if they did not (1) apply for a credit card, (2) answer comprehension questions regarding their assigned scenario correctly on the first try, (3) provide a relevant and original response to an essay question regarding their card choice, or (4) click on at least one learn-more link.*

	(1) Did not apply	(2) Failed Questions	(3) Improper Essay	(4) No Links Clicked	Total % Excluded	After Exclusions, % total sample
Rates Irrelevant, Easy Access (N =740)	17.43% (n = 129)	6.08% (n = 45)	4.46% (n = 33)	6.08% (n = 45)	34.05% (n = 252)	25.38% (n = 488)
Rates Irrelevant, Difficult Access (N =749)	16.29% (n = 122)	4.41% (n = 33)	3.60% (n = 27)	12.15% (n = 91)	36.45% (n = 273)	24.75% (n = 476)
Rates Relevant, Easy Access (N = 754)	19.36% (n = 146)	4.38% (n = 33)	7.16% (n = 54)	3.32% (n = 25)	34.22% (n = 258)	25.79% (n = 496)
Rates Relevant, Difficult Access (N =732)	19.67% (n = 144)	3.28% (n = 24)	5.74% (n = 42)	8.06% (n = 59)	36.75% (n = 269)	24.08% (n = 463)

Method

Upon entering the website, participants were assigned to one of two hypothetical consumer scenarios: ‘rates relevant’ or ‘rates irrelevant’. Participants were forced to see these scenarios for at least 15 seconds before they were allowed to proceed to the comprehension questions and then the banking website. Participants in the ‘rates relevant’ condition were *revolvers*: they were assigned to a scenario in which they carried a balance and failed to make *any* minimum monthly payments (making default rates highly relevant; see **Figure 2**). This condition represents revolvers who, in our scenario, *always carry balances*. Those in the ‘rates irrelevant’ condition were *transactors*: they were told they paid off their balance in full each

month (making interest and default rates irrelevant; see **Figure 3**). The 'rates irrelevant' condition represents transactors who *never carry balances*, and thus would not need to pay attention to interest rates, even for future risk mitigation.

Figure 2: *Rates Relevant Condition Assignment*

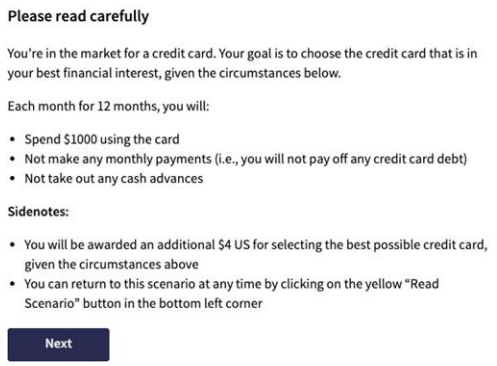
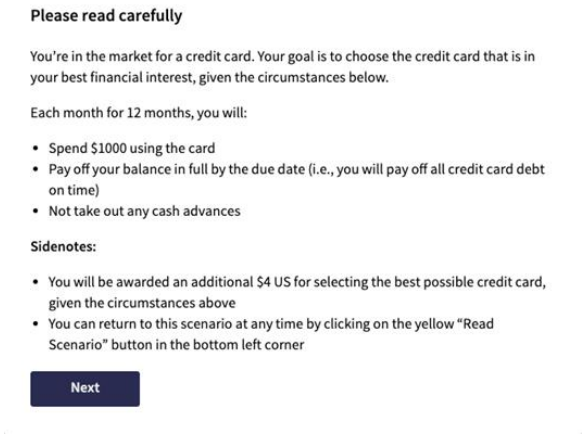


Figure 3*: Rates Irrelevant Condition Assignment*



Additionally, participants were assigned to one of two access treatments: 'easy access' or 'difficult access' to the Information Box (see **Figure 3.5**). Participants in the 'easy access' condition had access to salient (red and bolded) hyperlinks right under each of the eight credit cards during shopping that led them straight to the Information Box (see **Figure 4**). They could also view the Information Boxes at the end of their search process, after they selected a card to

apply for. Participants in the 'difficult access' condition, however, were only able to view the Information Boxes after selecting a card to apply for (mimicking real-life status quo; see **Figure 5)**. Or, these participants could have, in theory, clicked on a tiny superscript hyperlink which led them to the terms and conditions that contained another hyperlink to the Information Box at the bottom (again, mimicking the inaccessibility of Information Boxes on real banking websites). Participants were told to browse the cards and select the one that was in their best financial interest given their assigned scenario. They then filled out the FINRA 5-question financial literacy test, and were asked to recall the cashback percentages, interest rate, and default rate of the card they chose.

Figure 3.5: *Information Box on Choice Research Bank*

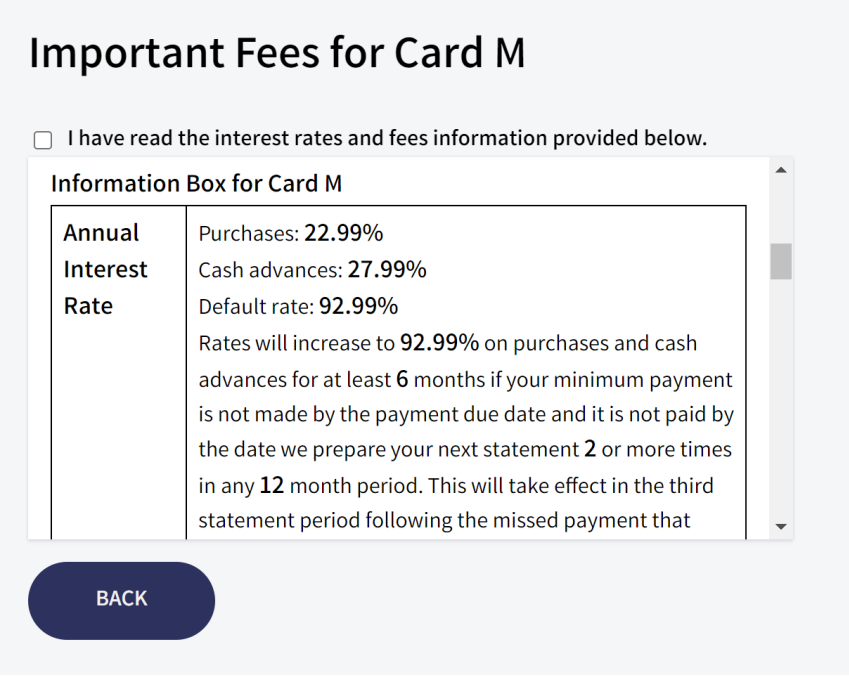


Figure 4. *Easy Access Condition website experience. In the Easy access condition, information boxes are made easier to find through the capitalized red hyperlinks on the summaries of each card. On the left side is the initial landing page, and on the right is the "learn more" page.*

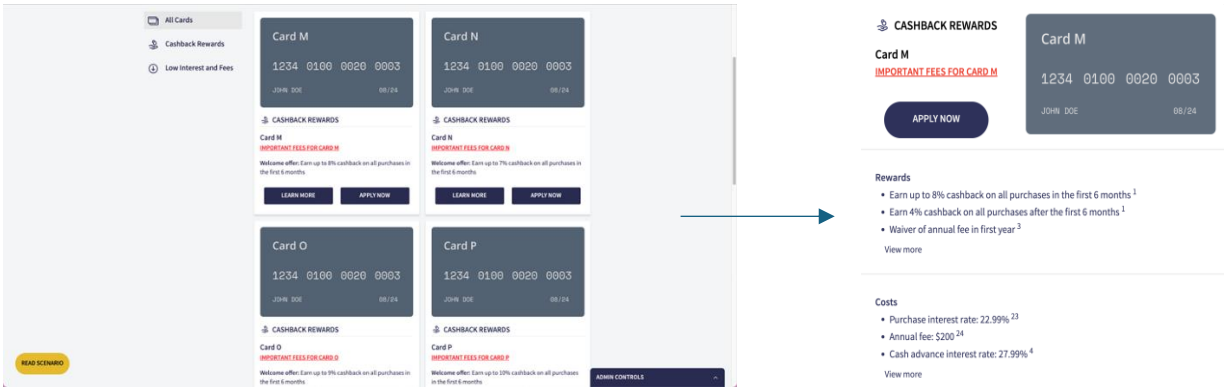
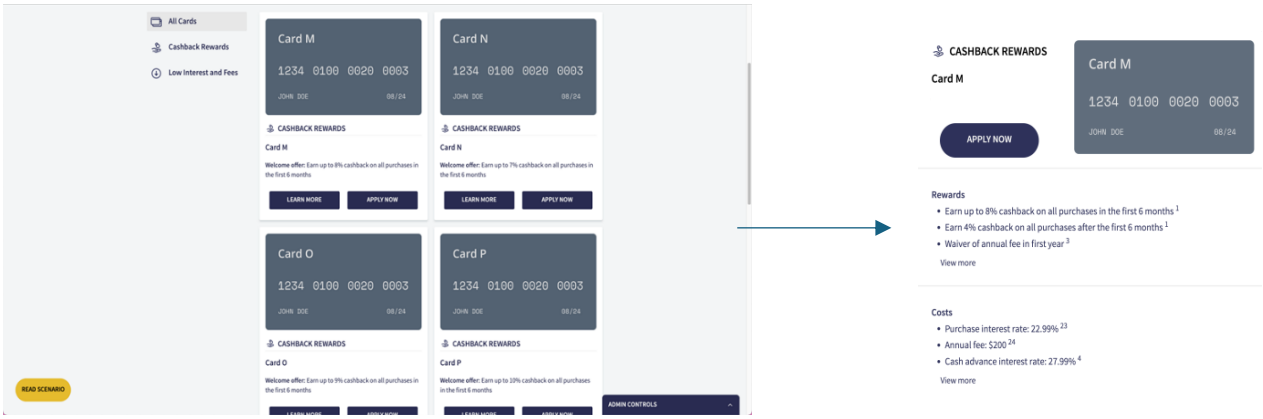


Figure 5. *Difficult Access Condition website experience. Participants in the difficult access condition experience the same online framework as a consumer shopping for a credit card on a real banking website. Information boxes are still accessible after card selection but are otherwise difficult to find. On the left side is the initial landing page, and on the right is the "learn more" page.*



The rates versus cashback percentages selected for the cards mimicked the real-life trade-off for credit cards: cards with low rates tend to have low cashback rewards, and cards with high rates tend to have high cashback rewards (see **Table 2**) Importantly, there was an objectively correct card choice for each condition. The optimal card for the *'rates relevant'* participants was *Card K*. This was the only card without a 70-percentage point increase in the interest rate when

defaulting – information that was only stated in the Information Box. The optimal card for the '*rates irrelevant'* participants was *Card O*. This card was the only one which doubled (instead of halved) its cashback percentage after 6 months. The post 6-month cashback percentages were only visible after clicking the cards' learn-more links (see **Figures 4, 5**). This meant that selecting any card other than the objectively correct card caused participants to miss out on benefits that were most important to their assigned scenario (whether that was higher rewards or lower default rates). Additionally, we collected scroll percentage data on Information Boxes; this allowed us to determine if the participant had scrolled far enough down the Information Box, 17% of the way, such that the default rate was visible on the screen. This became our criteria for whether the individual had been exposed to the default rate. Additionally, we collected start and end timestamps which allowed us to reconstruct the time spent on each page during the shopping process. For an overview of all our variables of interest, see **Figure 5.5**.

All participants who completed the experiment by applying for a credit card received $2US, and to make the choice incentive-compatible, participants were told they would receive an additional $4US for selecting the best card for their assigned scenario.

Figure 5.5. *Overview of variables of interest, and how each variable was measured.*

Variable	Description
Time spent on each page	Using clickstream data, observed time spent the following pages: - Initial landing page with the 8-card overview **(first 6-month cashback percentage found here)** - "Learn more page" which was available after clicking the "learn more" link on the initial landing page **(post 6-month cashback percentage and interest rate found here)** - Information Box which was available via salient hyperlink in the easy access condition and only after selecting a card to apply for in the difficult access condition **(default rate found here)**
Number of default rates seen	Classified as "seeing" the default rate if the participant scrolled down 17% of the Information Box
Chosen card	The card that the participant selected and "applied" for (and whether it was the correct card for their assigned hypothetical scenario)
Recall of terms of chosen card	Participants were asked to recall: - First 6-month cashback percentage - Post 6-month cashback percentage - Interest rate - Default rate
Individual Differences	Age, employment status, income, financial literacy (using FINRA 5-question test), home ownership status

Table 2. Cards and their unique terms. *Optimal Cards for the 'rates relevant' (Card K) and 'rates irrelevant' (Card O) participants are highlighted, and their terms bolded.*

		First 6-Month Cashback	***Post 6-Month Cashback***	***Annual Fee***	***Interest Rate***	***Default Rate***
Accessibility Before Applying	***Easy Access***	Immediately Visible	***One click away***	One click away	One click away	***One click away***
	Difficult Access	Immediately Visible	***One click away***	One click away	One click away	***Only after applying***
"Low Fees Cards"	***Card I***	2%	1%	$50	12.99%	82.99%
	Card J	1%	0.5%	$100	10.99%	80.99%
	Card K	3%	1.5%	$100	14.99%	***21.99%***
	Card L	4%	2%	$150	16.99%	86.99%
"High Rewards Cards"	***Card M***	8%	4%	$200	22.99%	92.99%
	Card N	7%	3.5%	$250	20.99%	90.99%
	Card O	9%	***18%***	$250	24.99%	94.99%
	Card P	10%	5%	$300	26.99%	96.99%

Results and Discussion

We first checked the baseline characteristics to ensure that our sample was balanced. We found no significant differences across conditions in any of the characteristics (all *p*-values > .16; see **Table 3**).

We used Linear Probability Models[1] to determine whether there are effects of easier access to the Information Boxes and relevance of rates on the likelihood of selecting the correct credit card (1 = correct; 0 = incorrect), and whether there is an interaction between them. We also assessed whether the effects hold controlling for other covariates (see **Table 4, Column 2** for covariates). To understand the process underlying the effects, we used mediation analysis to determine whether access to Information Boxes affects correct credit card choice through increasing the number of default rates to which the participant self-exposed. To explore the process further, we utilized the timestamp and term recall answers to determine how ready access to Information Boxes may have changed what participants were devoting attention to during the search process, and how this may have assisted or prevented individuals from selecting the correct card. Specifically, we determined how easier access to Information Boxes changed the time allocation on "learn more" pages (where important rewards information was for 'rates irrelevant' participants) and Information Boxes pages (where important cost information was for 'rates relevant' participants). Looking at term recall of the card chosen was a second indicator of what participants paid attention to more during the search process.

Table 3. Average Sociodemographic Features across all treatment groups, tested for significant difference of means between groups using one-way ANOVA test of four treatment groups*. Means of binary variables are proportions: employed, own, rent, retired, student,*

[1] We use a linear model over a logistic model for interpretability and for due to the complexity of using logistic regression for moderated-mediation analyses. Testing both models, we observe negligible differences in inferential statements. We refer to Gomila (2021) for arguments justifying the linear approach.

unemployed. Financial Literacy was measured using the FINRA 5-question test, while the others were self-reported. Estimates for birth year and income were evaluated after removing obviously false responses (birth year was required to be between 1900 and 2023, and removed incomes not ending in a 0, over $1,000,000/yr, $0/yr, and sequences such as $12345)

Covariate	**Easy Access, Rates Relevant**	**Difficult Access, Rates Relevant**	**Easy Access, Rates Irrelevant**	**Difficult Access, Rates Irrelevant**	***ANOVA Pr(>F)***
Birth year	1981.678	1982.400	1981.880	1981.522	*0.527*
Employed	0.798	0.784	0.803	0.800	*0.473*
Income	62453.72	53946.39	59224.95	60876.70	*0.268*
Literacy	0.790	0.784	0.793	0.804	*0.341*
Own	0.476	0.501	0.531	0.523	*0.176*
Rent	0.407	0.374	0.375	0.363	*0.675*
Retired	0.044	0.050	0.047	0.048	*0.938*
Student	0.026	0.037	0.035	0.032	*0.990*
Unemployed	0.103	0.102	0.086	0.082	*0.258*

Correct Card Choice.

We observed a significant interaction between our assigned treatments on correct card choice of 41.0 percentage points ($p < .0001$ 95% CI [-0.494, -0.327], see **Table 4**). We

decomposed this effect by regressing correct card choice on ease of access to Information Boxes for each the 'rates relevant' and 'rates irrelevant' conditions separately (see **Table 5** and **Figure 6**). We first found that making interest rates easier to access is a double-edged sword. For those for whom rates were relevant, making Information Boxes easier to access *increased* their likelihood of choosing the correct card by 26.76 percentage points ($p < .0001$, 95% CI [.210, .325]), while those for whom rates were irrelevant had a *decrease* of 14.25 percentage points ($p < .0001$, 95% CI [-.204, -.081]).

These results first indicate that making Information Boxes easier to access does improve their effectiveness, but only for participants who stood to benefit from knowing about the obfuscated costs outlined in the Information Boxes. When those costs were irrelevant, providing participants with this information was harmful. Importantly, however, even for those for whom the mandated disclosures were helpful, this was only the case when the information within the Boxes was available to participants *during* their card search and comparison process (i.e., the 'easy access' condition) rather than being withheld until after the participant had made their choice (i.e., the 'difficult access' condition). When the disclosures were withheld until after a card was selected, as is the real-life status-quo, participants did not see enough default rates to be able to use them to comparison shop (see **Figure 7**).

Figure 6. *Proportion of correct card choice in each of the four treatment groups. Error bars depict 95% confidence interval based on estimated standard error of each sub-sample.*

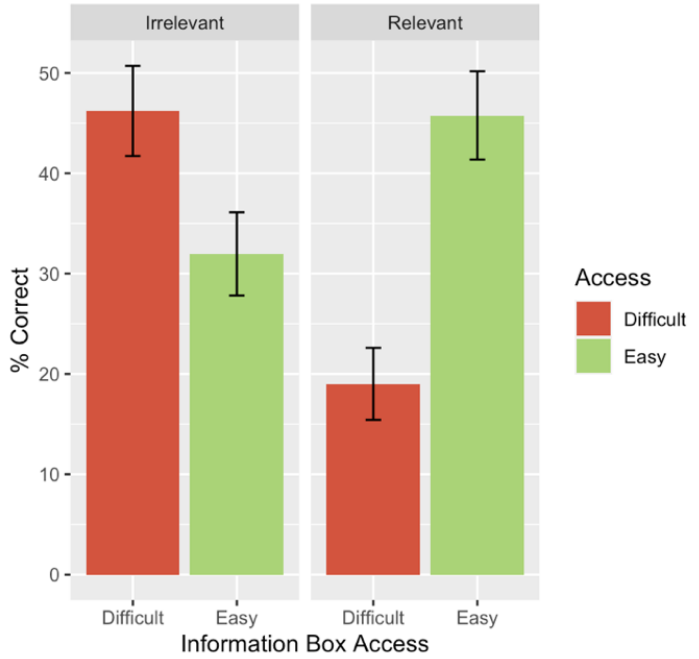


Figure 7. *Average Default Rates Seen Per Person for each of the four treatment groups. Error bars depict a 95% confidence interval. Default rates seen is defined as the number of default rates out of 8 possible cards that were visible on the screen throughout the experiment. These were self-exposed through the participant scrolling down far enough (17%) on an Information Box screen.*

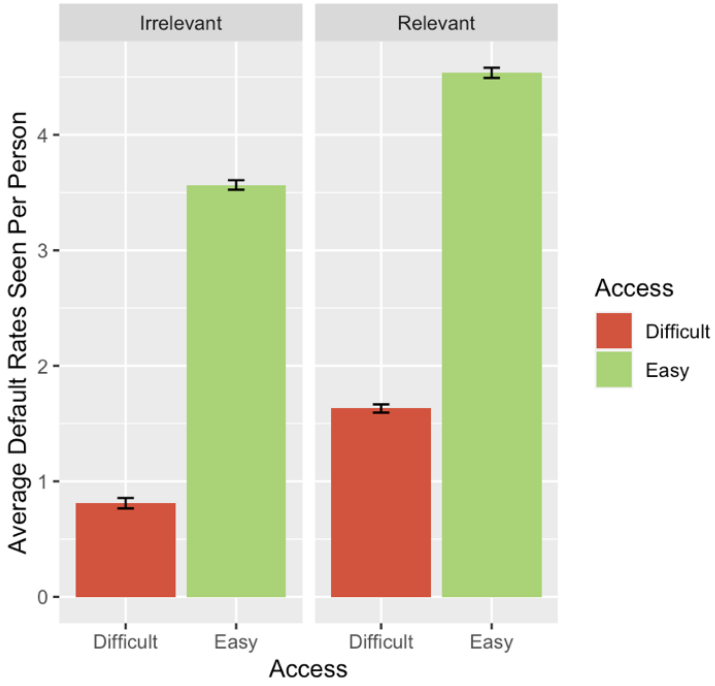


Table 4. *OLS regression results of correct card choice on 2x2 treatment interaction (column 1), and the model tested for robustness (column 2).*

	Dependent variable:	
	Correctness	Correctness
	(1)	(2)
Rates Irrelevant Scenario	0.272***	0.271***
	(0.030)	(0.031)
Easy Access to Information Boxes	0.268***	0.260***
	(0.030)	(0.031)
Birth Year		-0.0001
		(0.0001)
Literacy		0.346***
		(0.053)
Employed		-0.014
		(0.028)
Rates Irrelevant x Easy Access	-0.410***	-0.405***
	(0.043)	(0.043)
Constant	0.190***	0.081
	(0.022)	(0.261)
Observations	1,923	1,825
R^2	0.054	0.076
Adjusted R^2	0.052	0.072
Residual Std. Error	0.467 (df = 1919)	0.464 (df = 1818)
Note:		*p<0.1; **p<0.05; ***p<0.01

Table 5. *Effect of Easy access condition on correct card choice in 'rates relevant' (1) and 'rates irrelevant' (3) scenarios. Columns (2) and (4) display results for robustness tests.*

	Dependent variable: Correctness			
	Rates Relevant		Rates Irrelevant	
	(1)	(2)	(3)	(4)
Easy Access	0.268***	0.260***	-0.143***	-0.145***
	(0.029)	(0.030)	(0.031)	(0.032)
Literacy		0.277***		0.421***
		(0.072)		(0.079)
Employed		-0.008		-0.020
		(0.038)		(0.042)
Birth Year		-0.0001		0.0004
		(0.0001)		(0.001)
Constant	0.190***	0.140	0.462***	-0.679
	(0.021)	(0.257)	(0.022)	(2.562)
Observations	959	913	964	912
R^2	0.081	0.093	0.021	0.053
Adjusted R^2	0.080	0.089	0.020	0.049
Residual Std. Error	0.451 (df = 957)	0.450 (df = 908)	0.483 (df = 962)	0.478 (df = 907)
Note:				*p<0.1; **p<0.05; ***p<0.01

Mediation Analysis.

Easier access to Information Boxes should impact correct credit card choice primarily by increasing participants' exposure to default rates, which are highly important when participants carry a revolving balance (i.e., 'rates relevant') but not when the balance is paid off in full by the

end of each payment period (i.e., 'rates irrelevant'). **Figure 7** depicts the initial effect of easier access to Information Boxes on average default rates seen (in the Information Boxes) in both the 'rates relevant' and 'rates irrelevant' scenarios. Making access to the Information Boxes easier caused participants in both rates relevance conditions to see more default rates, on average, suggesting that participants were accessing more Information Boxes.

Mediation analysis was conducted by decomposing the total causal effect into two pathways: the indirect effect and the direct effect, both of which were estimated using linear models. This was conducted separately for 'rates relevant' and 'rates irrelevant' participants.

The effect of easy access on correct card choice is fully mediated through the number of default rates seen by the 'rates relevant' participant (see **Figure 8**), and partially mediated for the 'rates irrelevant' participant (see **Figure 9**). Easier access increased the number of default rates seen for both scenarios (relevant: $a = 2.906$, $p < 0.001$; irrelevant: a = 2.75, $p < 0.001$). However, each default rate seen increased the likelihood of choosing the correct card for those in the 'rates relevant' condition ($b = 0.115$, $p < 0.001$) and decreased it for those in the 'rates irrelevant' condition ($b = -0.04$, $p = 0.001$). Both conditions were exposed to more information boxes, but this led to better choices only when the information was relevant. When the information was irrelevant, increased viewing led to worse choices.

Looking at this mediation model allows us to understand that the process by which information disclosures help or hinder participants occurs through the number of default rates to which the participant is exposed – information that was available to them only via the Information Box. While each default rate viewed by the 'rates relevant' participant helped them in identifying the correct card, it was harmful to the 'rates irrelevant' participant.

Figure 8. *Rates Relevant Mediation Analysis Diagram*

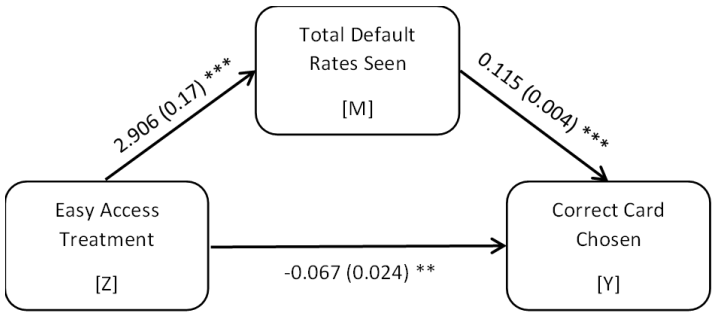
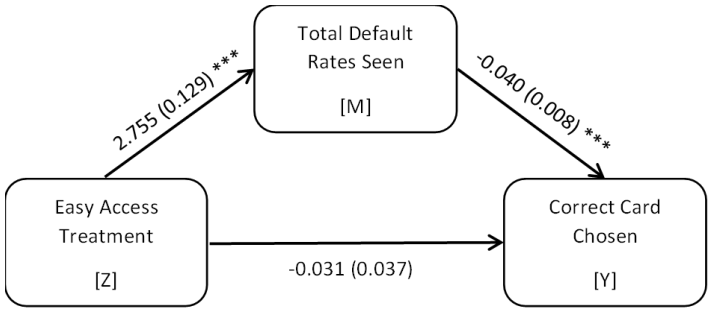


Figure 9. *Rates Irrelevant Mediation Analysis Diagram*



Participants' Attention.

As previously mentioned, there are various reasons why withholding disclosures until after individuals select a card may decrease their effectiveness. One of those reasons is that easier access to the cost information within the Information Boxes may change what individuals are paying attention to during their card exploration, and thus what information they are using to comparison shop.

To explore this, we looked at two possible metrics to gauge the attention of participants during the shopping process: time spent on pages that advertise specific terms, and the participant's recall of those terms for their chosen card after applying. For example, if participants in a specific condition spent, on average, more time on the Information Boxes and

were also better able to recall the default rate for the card they chose, this indicated that they may have paid more attention to the information within the Information Boxes. Similarly, if participants in a specific condition spent, on average, more time on the "learn more" pages and were also better able to recall the post 6-month cashback percentage for the card they chose, this indicated that they may have paid more attention to the "learn more" pages.

First, we determined that participants in all conditions spent approximately the same amount of time shopping (see **Table 6**). This indicated that participants devoted a similar amount of time and attention to the task, regardless of their condition or the amount of information we provided them with. This also meant that in order to devote additional attention to a newly accessible page, attention would need to have been taken away from another page.

Table 6. *Time Spent on pages during shopping. Total time spent shopping includes cashback pages, rates pages before and after starting the application process, terms and conditions, and menu/card summary pages.*

Covariate	**Easy Access, Rates Relevant**	**Difficult Access, Rates Relevant**	**Easy Access, Rates Irrelevant**	**Difficult Access, Rates Irrelevant**	**ANOVA Pr(>F)**
Cashback Pages	84.877	160.172	84.141	130.570	0.000
Rates Pages After Apply	41.108	60.018	38.321	54.264	0.000
Rates Pages Before Apply	110.490	2.007	92.795	0.362	0.000
Total Time	***432.272***	***417.677***	***415.429***	***376.585***	***0.257***

Rates Relevant Participants. For 'rates relevant' participants, making Information Boxes easier to access increased time spent on Information Boxes, which contained information about default rates (b = 89.57, p < 0.0001, 95% CI: [74.43, 104.72]), and decreased time spent on "learn more" pages, which contain interest rates and post 6-month cashback rewards (b = -75.30, p < 0.0001, 95% CI: [-94.58, -56.01], see **Figure 10**). Subsequently, 'rates relevant' participants in the easy access condition were less likely to recall 6-month cashback rewards (b = -0.131, p < 0.0001, 95% CI: [- 0.192, -0.070]), post 6-month cashback rewards (b = -0.129, p < 0.0001, 95% CI: [-0.179, -0.079]), and interest rates (b = -0.096, p < 0.01, 95% CI: [-0.154, -0.039]), but were more likely to recall their chosen card's default rate (b = 0.215, p < 0.0001, 95% CI: [0.154, 0.277]; see **Figure 11**. This suggests that easier access to the Information Boxes diverted 'rates relevant' participants' attention towards the default rate information in the Information Boxes which positively affected their choices, since important information (for their borrowing scenario) was now brought to their attention early enough in the decision process that it could be used to comparison shop.

When Information Boxes were difficult to access, 'rates relevant' participants were more likely to choose a card based on less-relevant terms (e.g., Card J – lowest interest rate). However, diverting attention towards the relevant default rates information by making Information Boxes more accessible caused participants to select the lowest default rate card more, which was indeed the optimal card for Rates Relevant participants (b = 0.268, p < 0.0001, 95% CI: [0.209, 0.326]). This increase in the selection of the optimal card comes from two sources: a decrease in selecting the card with the lowest interest rate (less attention devoted to interest rate information), (b = -0.155, p < 0.0001, 95% CI: [-0.215, -0.095]), and a decrease in selecting the card with the

highest post 6-month cashback (less attention devoted to rewards information; b = -0.066, p < 0.001, 95% CI: [-0.104, -0.029], see **Figure 12**).

Figure 10. *Rates Relevant Participants: Change in time spent on pages when disclosures made easy to access*

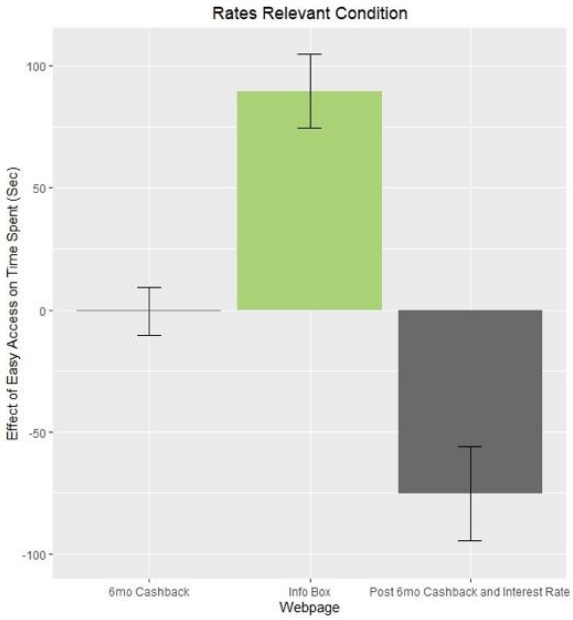


Figure 11: *Rates Relevant Participants: Change in recall of card terms for chosen card when disclosures made easy to access*

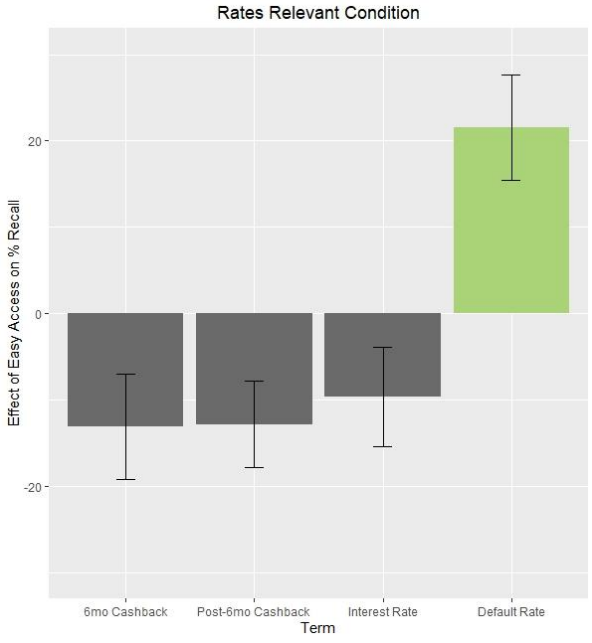
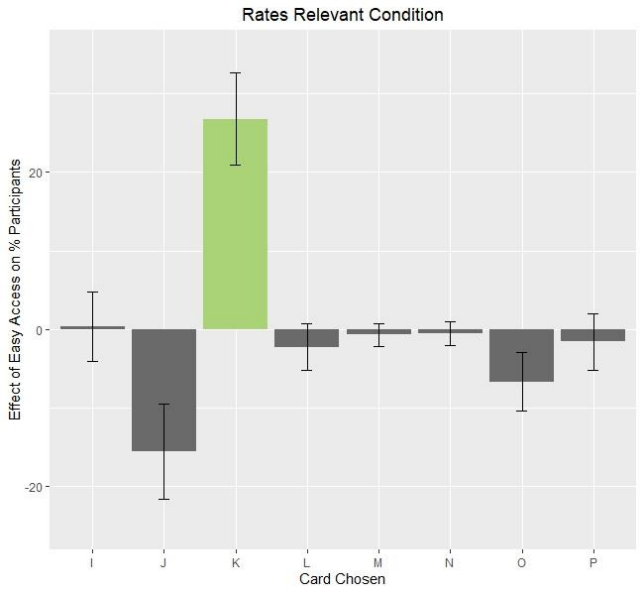


Figure 12: *Rates Relevant Participants: Change in percentage of participants choosing each card when disclosures made easier to access*



Rates Irrelevant Participants. For 'rates irrelevant' participants, we see similar compensatory reallocation of attention. Easier access to Information Boxes shifted attention away from the "learn more" pages which advertised the important post-6 month cashback rewards (b = -46.43 , p < 0.0001, 95% CI: [-63.49, -29.37]). Instead, 'rates irrelevant' participants in the easy access condition spent more time on Information Boxes, which contained the irrelevant default rate information (b = 76.49, p < 0.0001, 95% CI: [63.14, 89.84]) and on pages with the less-relevant first 6-month cashback rewards (b = 16.35, p < 0.01, 95% CI: [6.02, 26.68]: see **Figure 13**). Subsequently, we see a decrease in recall for both the first 6-month and post 6-month Cashback when Information Boxes were made easier to access, (first 6-month cashback: b = -0.763, p < 0.01, 95% CI:[- 0.125, - 0.027]; post 6-month cashback: b = - 0.171, p < 0.0001, 95% CI: [-0.233, -0.110]) At the same time, we see an increase in the recall of default rates, likely due to the additional time spent on Information Boxes (where default rates were

found; $b = 0.079$, $p < 0.01$, 95% CI: [0.027, 0.132]; see **Figure 14**). Overall, this indicates a decrease in attention devoted to the post 6-month cashback rewards (the most relevant term) and an increase for irrelevant terms, such as the default rate.

For 'rates irrelevant' participants, selecting the correct card choice meant going through a two-stage reward maximization process. First, participants would have seen the first 6-month cashback percentage on the initial card overview page. However, they needed to also click on the "learn more" page to see that for all cards except one, the cashback percentage *halved* instead of doubling (see **Figures 4 & 5**). Understanding this makes it clear to see how diverting attention to irrelevant cost terms impacted 'rates irrelevant' participants. When the Information Boxes were difficult to access, 'rates irrelevant' participants were most likely to select card O, which was the correct card for their scenario. However, when the Information Boxes were easier to access and participants spent more time and attention on them, it appears that they only got through that first stage of the reward-maximization process and were likely to pick car P – the one with the highest *first* 6-month cashback percentage (that halved in the following 6-months; $b = 0.065$, $p < 0.05$, 95% CI: [0.010, 0.119]) – instead of card O (the optimal card with the highest post 6-month cashback percentage; $b = -0.143$, $p < 0.0001$, 95% CI: [-0.206, -0.079], see **Figure 15**). Thus, we see that making Information Boxes easier to access took attention away from understanding the reward-maximization process for 'rates irrelevant' participants. Easier access to disclosures, for these participants, was therefore harmful.

Figure 13: *Rates Irrelevant Participants: Change in time spent on pages when disclosures made easy to access*

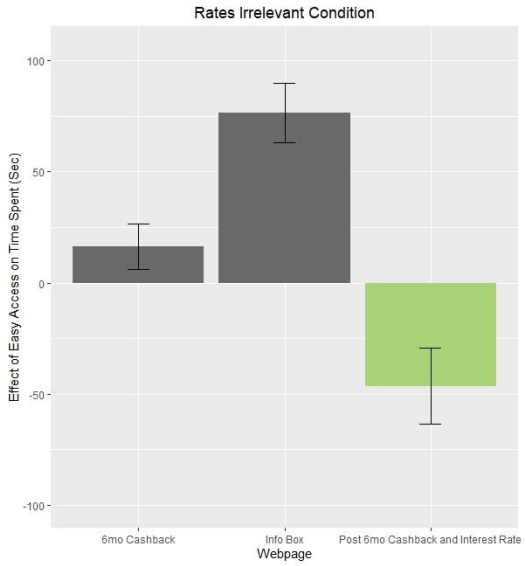


Figure 14: *Rates Irrelevant Participants: Change in recall of card terms for chosen card when disclosures made easy to access*

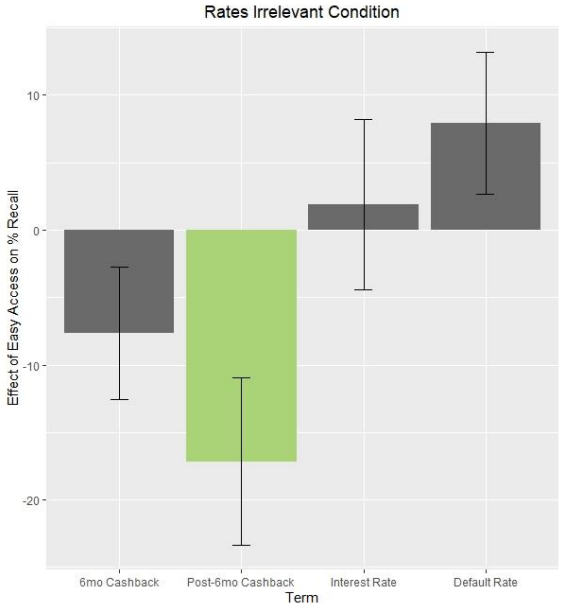
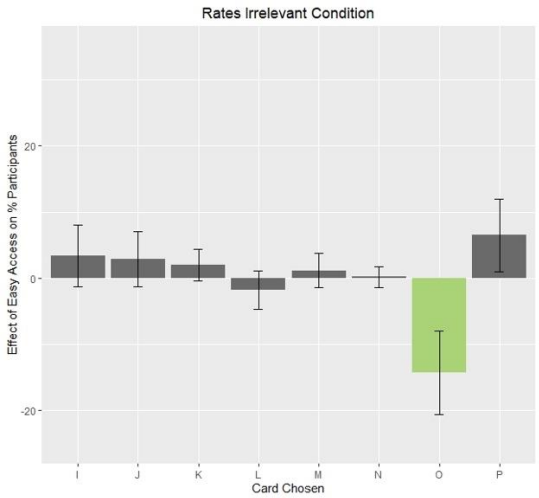


Figure 15: *Rates Irrelevant Participants: Change in percentage of participants choosing each card when disclosures made easier to access*



GENERAL DISCUSSION

Current regulations state that mandated disclosures must appear *at some point* prior to the final cardholder agreement, which in online applications often results in required disclosures being withheld until just after a card has already been selected. In this research, we explored whether making mandated term disclosures more readily available during the credit card search and comparison process might make them more effective. Additionally, we created an experimental setting where we could test for heterogeneity across credit card users to see whether this improved accessibility may backfire in situations where the information within the disclosures may be irrelevant to certain individuals.

Our results suggest that when Information Boxes are withheld until the end of the credit card search and comparison process (i.e., after a card has already been selected), individuals may not be fully attending to the information within them in a way that would allow for more informed comparison shopping (Consumer Financial Protection Bureau; Ausubel 1991; Berlin & Mester 2003). However, when these disclosures are made more readily available to individuals

earlier on (i.e., when each card is first being advertised), they are better able to use the disclosed term information as a tool to compare cards and make better choices. Importantly, however, making these disclosures more accessible is a double-edged sword. Improved access only helps individuals for whom the information within the disclosures is relevant. For those for whom it is irrelevant, the disclosures redirect attention away from more relevant information (for their specific decision context) causing them to make worse choices. Specifically, in our study, we wish to highlight two key takeaways:

1) For mandated disclosures to succeed in helping individuals price shop and compare products in a more informed way, it may be more beneficial to ensure that they are easy to access while individuals are searching for and comparing products. This way, individuals who would benefit from knowing the information within the disclosures can better incorporate that information into their decision-making and use the cost terms as an attribute on which they can compare products.
2) Making mandated disclosures easier to access is a double-edged sword because of the heterogeneity of which information is important across different credit card users. Making irrelevant information more readily available may cause individuals to end up making worse choices because their attention is redirected away from information that is contextually more important for them to focus on.

Our study also featured large and seemingly obvious differences across cards and simpler-than-usual borrowing scenarios which should have made cost-benefit analyses as easy as possible for participants. Under these conditions, participants were set up for success and should have been particularly likely to make the right choices as these large differences should have caught their attention more so than realistic differences in actual credit card comparisons. This

raises further concerns about what the effectiveness of mandated cost disclosures may be in the real world where differences across cards may be more subtle and hard to notice.

Theoretical Implications.

Importantly, our findings contribute to the literature on the effectiveness of mandated information disclosures. Specifically, our experimental results echo concerns of prior scholars about the effectiveness of mandated disclosures (e.g., Ben-Shaher & Schneider 2011, Willis 2006). In our empirical setting, disclosures proved to be highly effective for one group of participants (those acting as revolvers), but only when the disclosures were made readily available. When made easier to access, the disclosed information indeed helped participants arrive at the correct credit card choice. This suggests that ease of access to disclosures is highly important to consider when theorizing about their effectiveness.

Our findings also contribute to our broader understanding of how individuals search for information pre-purchase. Prior literature has suggested that decision-makers engage in little overt search for information prior to selecting a product (e.g., Beales et al. 1981; Claxton et al. 1974; Chang & Hanna 1992). Results from the 'rates relevant' condition seem to support this literature. For these participants, their assigned scenario should have made it very information that default rates were highly important for their decision. Thus, one might have expected that they would have thoroughly searched the site for information about defaults rates prior to selecting a card. However, when the disclosures were withheld until the end and were otherwise challenging to locate (difficult access), it does not seem that participants went explicitly searching for this default rate information, as the majority only viewed one default rate during their shopping process. Thus, default rates were not an attribute that participants searched for to

use as a comparison tool. Prior literature (e.g., Russo et al. 1986) also suggests that a way to help individuals attend to important information during their search process is to decrease effort and search costs associated with seeking out information. Accordingly, we find that making the disclosures easier to access (i.e., decreasing effort and search cost associated with attending to the information within them) helped more participants pay attention to default rate information. Now, in the easy access condition, participants were viewing four to five default rates on average, allowing for that information to be used as a comparison tool.

Our findings also allow us to speculate about why withholding disclosures until after individuals select a card may make them less effective. While individuals may not explicitly search for this obfuscated information before initially selecting a card, one might have anticipated that upon encountering their first Information Box and the cost information within it, participants may have wanted to go back and explore more cards. Instead, we find that participants did not generally go back to view more cards. This lends support to the idea that perhaps participants felt a sense of psychological ownership over their selected card which biased what information they paid attention to upon encountering the Information Box (Thaler 1980; Kahneman, Knetsch, & Thaler 1990; Carmon & Ariely 2000; Nayakankuppam & Mishra 2005; Ashby, Dickert, & Glöckner 2023). Alternatively, we also observed that participants on average spent the same amount of time on the task in all conditions. This lends support to a finite attention story, which suggests that individuals have a finite amount of effort and time they are willing to devote to a given task (Simon 1955; Caplin et al. 2011). Thus, even if upon encountering their first Information Box they realized that some terms on the card were concerning, they may have lacked the wherewithal, time, and motivation to decide to abandon

the product and start entirely afresh (Hilchey & Taylor 2020; Day 1976; Cude 2005; Simon 1990). The following comment from one of our MTurk participants neatly exemplifies this point:

"The first mention of a much bigger interest rate for non-payment occurs AFTER you have made your selection. I spent a long time calculating and trying to figure it out, and I would have had to go back again and figure it all out over again. Don't do that to people… If you want people to use the non-payment interest rate, why wait to display it until after the choice is made? Am I supposed to go back, act like I'm applying for each card, and calculate everything all over again?"

Future research can work to disentangle the precise mechanism behind why late disclosures may be ineffective. Our findings simply suggest that individuals are more likely to attend to information that they receive in a timely manner, rather than information that is withheld until the end of their decision process.

Practical Implications

Practically, our findings first emphasize the importance of documenting heterogeneity to understand when policies (e.g., improved access to mandated disclosures) might have the intended effect of improving choice, and when we might observe a complete reversal (Soman and Hossain 2020). While one strategy may not be able to benefit all types of individuals, our findings present an opportunity to take advantage of customized disclosures, where different individuals are presented with information that is helpful for their specific decision context (see Thaler and Tucker 2013; Strahilevitz and Porat 2014). Regulatory authorities throughout the

world, including FCAC's Financial Consumer Protection Framework Regulations, have suggested that information provision needs to be customized to the needs of clients (2022). While we acknowledge that this might be easier said than done, our findings suggest that this indeed seems to be a great and important direction to head in.

Taking a step back, our findings document an instance in which a policy may not be fully succeeding in its goal of helping individuals make better decisions. Mandated disclosures are intended to help individuals make more informed decisions by providing them with critical information. When this is the intention, our findings suggest that policymakers should try to ensure that the information is provided to individuals in a way that is user-friendly and readily accessible. Even for the participants in our study who represented consumers who would benefit from the information within the Information Boxes (i.e., revolvers), mandated disclosures were far less effective when withheld until the end of the decision process, which is the current status-quo.

Limitations and Future Research

A potential concern with our study design and suggested mechanism is that our incentive for picking the right card was not large enough to give people enough motivation to spend the necessary amount of effort to select the best card. We tried to guard against unmotivated participants with our stringent, pre-registered exclusion criteria, but nonetheless cannot fully rule out that participants were not putting in as much effort as they would in the real world. This, however, pushes us to ask: how much effort do we expect individuals to put in in order to make the most cost-effective decision? What would be the reasonable level of difficulty? Is it reasonable to assume that individuals are willing to devote much more of their scarce time to

engaging in complex cost-benefit analyses in the real world? This, of course, remains an open question that future research can tackle.

This research also explored mandated disclosures in the specific context of loan products. Future research could benefit from testing the effect of ready access to typically delayed disclosures in other industries and for other products for which there is significant heterogeneity across consumers on which information is relevant to whom.

Conclusion

Our data allow us to conclude a number of findings about decision-makers' attention and search behaviour. First, our findings emphasize that if the intention is to help individuals shop in a more informed way, important information should be disclosed to them early enough in their decision process that they can incorporate it into their choice. Simply mandating its disclosure may not guarantee that it will be attended to by individuals. Second, easier access to information may be important for those for whom it is relevant, this may not be a universally beneficial strategy for all individuals. Those for whom the information is irrelevant may instead be harmed. Individuals would benefit from having a more individualized shopping experience that would allow them to make comparisons and choices between products on attributes that are most important to them, without irrelevant attributes fighting for and using up their attention. Overall, this work contributes to our broader understanding of the effectiveness of mandated disclosures, and also when providing individuals with important information aids choice vs. when it may backfire.

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