Effects of the Menu of Loan Contracts on Borrower Behavior*

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Abstract

We study how the menu of contracts presented to a decision maker – including contracts she may be precluded from choosing – affects her choice of remunerative but risky actions relative to lower paying, less risky alternatives. We do this through a series of lab experiments modeled after the loan repayment options offered to U.S. student borrowers, analyzing borrowers' task (career) choices in settings that vary the menu of available and unavailable loan repayment plans and knowledge of unavailable options. In these experiments, we observe behavior that is inconsistent with predictions from standard economic models in which agents can easily make complex decisions and each alternative in a choice set is evaluated independently of other potential options. Instead, we provide evidence that expanding the menu of choices or making an agent aware of choices that she has been denied can affect how a contract is valued. Our empirical findings are most consistent with behavioral models that allow for anticipated regret over a choice that turns out to be suboptimal *ex post* or preferences for simplicity and gratitude for being unburdened from having to make a choice.

Keywords: contract choice, task choice, reference dependence, designing menu of contracts

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1 Introduction

According to standard economic theory, agents should prefer a larger set of options when choosing from a menu. This result assumes that, if presented with additional options, agents are easily able to identify the best available choice and that having additional choices can never make the agent worse off. In reality, however, agents may find it hard to choose among competing options or the availability of alternatives may reduce the value of an existing option. In this paper, we present results from a series of lab experiments that allow us to study agents' valuation of contracts presented on different types of menus. Our analysis focuses on the following questions: (i) Can an agent receive additional value from a contract when it is the only option rather than being one of multiple offered options? (ii) If the agent values a contract more when it is part of a smaller menu, does making her aware that she has been offered a smaller menu of options than her peers affect her evaluation of the contract? (iii) How does the content of the menu of contracts affect the agent's choice over actions that vary in risk and expected returns?

The answers to these questions are relevant to many settings that require agents to make significant decisions over varying menus of contracts, where such decisions could be affected by the set of options agents see. For example, consider an entrepreneur who is seeking financing for her business. She may be offered the choice between either a standard loan contract, in which she commits to repaying the full loan amount but retains the right to all of the potential upside returns, or an equity contract, in which both downside losses and upside returns are shared with investors. Along with a possible choice between these contracts, the entrepreneur also must consider how much risk to take in growing her business, recognizing that taking greater risks may create the possibility of greater returns. The menu of financing options presented to the entrepreneur, as well as options to which she may not have access, may affect both how she values the different contracts and her willingness to take risks. A second example is that of a buyer seeking financing for a home purchase. Available loans could include both fixed-rate and adjustable-rate mortgages, with the latter offering lower initial payments and a lower expected lifetime cost but greater risk in the form of potentially higher future payments. In addition to potentially choosing between these contracts, the homebuyer also must decide how expensive of a home to purchase and thus how much financing to obtain. The menu of mortgage options offered to the homebuyer, as well

mortgage options she learns about but cannot access, may affect both how she values the different options and which house she decides to purchase.

A third relevant example is Unilever's recent introduction of a richer menu of employee compensation options for some employees.[1] While most Unilever employees are offered a single contract —either a fixed payment or a company-determined combination of fixed and bonus payments— a limited number of employees now have the option to choose the weights on the fixed and variable components of their compensation. Offering these options to only some employees may affect how employees in both groups evaluate the different compensation schemes as well as their effort and career path choices. Employer-provided health insurance plans provide a fourth potential application. In many cases, employees can choose between either a high premium/low deductible plan or a low premium/high deductible plan. Health insurance menus may change over time, resulting in variation in available plans across employees. Again, the menu of options on offer may affect employees' valuations of the different plans, as well as their health behaviors and use of health care services.

To make our analysis more concrete, we explore how a menu of contracts may affect an agent's valuation of alternative contracts and decisions about their activities in an environment inspired by the current debate over the design of student loan repayment plans in the United States. Outstanding student loan debt has grown considerably in recent years (Federal Reserve Bank of New York, 2020) and a significant share of borrowers default on their student loans (U.S. Department of Education, 2020a,b). Income-driven repayment plans have been introduced and promoted in response to concerns that the traditional mortgage-style payment plan aligns poorly with borrowers' post-college earnings profiles (Dynarski and Kreisman, 2013).

We present findings from lab experiments in which agents are offered a menu of contracts with choices designed to capture the key features of the options currently offered to U.S. student borrowers. Existing student loan repayment options include contracts in which borrowers must pay a mortgage-style fixed repayment (FR) amount each period over a set term and income-driven repayment (IDR) contracts that link repayments to realized earnings, with no payment required when earnings are low. Relative to the FR option, IDR reduces the risk of default due to poor labor

[1] https://www.ft.com/content/c7da13b2-fb42-11e9-a354-36acbbb0d9b6

market outcomes but potentially increases the length of repayment and total amount paid. In our setup, agents choose both a loan repayment contract and an income generating task –that varies in risk– to fulfil the contract requirements. We find that offering an IDR contract alone, rather than together with the option of an FR plan, makes a riskier but higher paying task more attractive to agents who would have chosen IDR irrespective of the availability of the alternative option. This implies that, in our setup, agents value IDR more when it is offered on a smaller menu. This effect is amplified when the fact that the offered menu of loan repayment options has been restricted is made more salient.

Since a borrower's utility from choosing a repayment plan is not observable, we cannot directly measure how the menu of options affects her utility. Instead, we infer the presence of menu-dependent shifts in the evaluation of different repayment plans from borrowers' choices over income generating tasks that offer differing risks and rewards.[2] Since IDR provides insurance against default in periods when low income would make payments under FR unaffordable, it also lowers the risk of pursuing more rewarding career paths that have a higher risk of income fluctuation. We focus on the question of whether the menu of plans offered in addition to IDR affects career choice. Specifically, we consider borrowers' choice of career in three settings: (i) when both IDR and FR plans are available to all borrowers, (ii) when all borrowers must participate in IDR and are unaware of FR as an option that could have been offered; and (iii) when some borrowers can choose between IDR and FR while others have no choice and must participate in IDR. Our results indicate that borrowers are most likely to choose risky but more rewarding income generating paths in settings in which they are aware that their choice of repayment plans is restricted to IDR and least likely to choose those paths when they are allowed to choose between IDR and FR.

The three repayment regimes we study are policy relevant. The first is a simplified version of the menu of options currently offered to U.S. student borrowers. Many countries have transitioned to the second regime – universal IDR – over the past three decades, and recently proposed legislation would place all new U.S. borrowers into IDR as well.[3] The third regime can be thought of as

[2] A handful of previous studies provide evidence that student loan debt affects borrowers' career choices (Field, 2009; Rothstein and Rouse, 2011; Weidner, 2016; Gervais and Ziebarth, 2019). Krishnan and Wang (2019) show that the removal of student loans from bankruptcy protection reduced the likelihood of successful entrepreneurship.

[3] Countries that have adopted universal IDR since 1989 include Australia, New Zealand, South Africa, the United Kingdom, Hungary, South Korea, and the Netherlands (Chapman, 2006; Lochner and Monge-Naranjo, 2016). In the

representing the transition period between the first and second regimes, since as when FR plans are eliminated, there will still be some borrowers who had been allowed to choose their plans in the past, while new borrowers will have only the IDR option.

To mimic the characteristics of existing FR and IDR plans in a simplified setting, our experiments involve a two-period environment in which borrowers vary in their probability of success in a difficult (risky but high paying) career. A borrower decides between FR and IDR (when this choice is available) and between the a difficult and an easy (safe but low paying) career. The borrower's earnings will depend on her career choice and ability. If the borrower performs her job successfully, she is paid; otherwise, she receives no income. Borrowers who choose the FR plan must make a fixed payment only in the first period (mirroring the shorter horizon of the standard repayment plan), but risk "default" if they do not have sufficient earnings. The easy job pays enough to fulfill the FR repayment obligation, thus, only borrowers who choose the difficult career risk defaulting on their loans. Borrowers who default do not have the opportunity to earn income in the second period. In contrast, under IDR, the borrower pays a percentage of her income in both periods but does not risk default. We set earnings for each career choice and the loan repayment parameters so that borrowers with ability below a threshold – defined with respect to the probability of success in the difficult option – always should choose the easy career, independent of repayment plan options. Further, in our setup, borrowers with sufficiently high ability always should choose the difficult career and FR (if available). We are especially interested in borrowers with intermediate ability. Under the conditions of the experiment, such borrowers should choose the difficult job and IDR.[4] In the absence of behavioral biases, offering only IDR or offering both IDR and FR should lead the same percentage of intermediate-ability borrowers to choose the difficult job. Our findings are at odds with this prediction, suggesting the presence of behavioral biases.

It is well established in the psychology, marketing and behavioral economics literatures that having more options does not always benefit an agent (e.g. Schwartz, 2004). Several theoretical explanations have been offered for why agents might prefer a smaller menu of options. Reference-dependent utility is one such reason for preferring a smaller menu. For a decision maker with

U.S. context, the 2013 ExCEL Act and the 2014 Dynamic Repayment Act would have limited new borrowers to IDR.

[4]The exact ability cutoffs that define the three groups (i.e., borrowers who should choose the easy task, borrowers who should choose the difficult task and IDR, and borrowers who should choose the difficult task and FR) will be higher in the presence of risk aversion, but the qualitative predictions should remain the same.

reference-dependent utility, an option's relative value may depend on the other choices on the menu. Having more options does not necessarily increase well-being and may in fact lead to lower well-being. This is true in models of regret (Bell, 1982; Loomes and Sugden, 1982) and in models of temptation and self-control (Gul and Pesendorfer, 2001). Anticipated regret may be a particularly powerful source of reference-dependence in utility in the presence of uncertainty. Consider, for example, a person who faces the risk of making a choice that, in the realized state of the world, turns out to be less desirable than an alternative available choice. Restricting such a person's options could have the beneficial effect of reducing anticipated regret. Limitations in an agent's ability to consider all available options is another possible reason. The consideration set model of Lleras et al. (2017), for example, studies agents who may not be able to evaluate all the options they are offered and, as a result, instead optimize only over the subset of the options they consider. If agents are more likely to choose sub-optimally from a larger menu, they may benefit from having their options restricted to reduce the complexity of their decisions. Choosing the optimal loan repayment plan is a complex problem that requires the borrower to take her future earnings prospects into account. IDR may be particularly difficult for borrowers to evaluate given uncertainty over future earnings.[5] We find evidence that subjects value the IDR repayment option more when it is offered alone rather than together with the FR option. As we will discuss later, this finding is consistent with the predictions of both complexity aversion (or preference for simplicity) and regret as influences on decision-making.

In an environment where people are better off when faced with fewer options, we can ask whether a person also would benefit from knowing she was offered a smaller menu. On the one hand, that knowledge could lead an agent to be frustrated that her freedom of choice was restricted. She could view the limitation as unfair or be envious of those who were given greater choice. On the other hand, if the borrower is sophisticated enough to foresee that having a larger set of choices is not necessarily a good thing, she may feel gratitude that she need only consider a smaller menu of options. We address this question by examining a repayment regime that makes the absence of FR for those forced into IDR more salient by allowing some borrowers to choose between FR and

[5] A growing body of research on students' borrowing and repayment decisions highlights their complexity and suggests that borrowers are influenced by factors such as debt aversion, framing, self-control issues, and default bias (e.g., Field, 2009; Cadena and Keys, 2013; Cox et al., 2018; Marx and Turner, 2019; Abraham et al., 2020).

IDR, while restricting the remaining borrowers to only IDR. If a borrower feels gratitude for the elimination of the need to choose a repayment plan, she should evaluate the choice of IDR more highly and, as a result, be more likely to pursue the difficult career than if she were allowed to choose between loan repayment plans. We find empirical support for such behavior. To the best of our knowledge, ours is the first paper in the literature to identify a positive effect resulting from the salient exclusion of a utility-diminishing option. We suggest gratitude for the simplification of a complex problem and gratitude for the elimination of a potentially regret-generating option as possible behavioral motives for the observed behavior.

Although our experiment and discussion are framed within the specific context of student loan repayment and borrowers' career choices, as already noted, the behavioral concerns we identify likely are applicable to many other settings. The menu of financing options made available to an entrepreneur could affect her evaluation of the different contracts and her willingness to take risks in building her business. The menu of mortgage alternatives presented to a homebuyer could affect her evaluation of the different mortgage choices and also her choice of home to purchase. The menu of compensation schemes made available to employees could affect their evaluation of the various schemes as well as their work performance. And the menu of health insurance plans made available to consumers could affect not only their valuation of the different plans but also their health behaviors.

The remainder of the paper proceeds as follows: Section 2 introduces a career and loan repayment choice problem for borrowers, discusses the predictions of the standard model for the menus of plans in which we are interested, and states how behavioral concerns may challenge those predictions. Section 3 explains the experimental procedures. Section 4 presents the empirical results. Section 5 discusses potential behavioral explanations for our findings and the extent to which they can account for our findings. Section 6 concludes.

2 A Choice Problem of Student Borrowers

We lay out the student borrower's choice problem as a finite period model in which individuals choose a loan repayment plan and an income-generating task. Although we motivate our inves-

tigation with reference to how the available student loan repayment plans may affect borrowers' behavior, the key insights generated by our setup are applicable to other settings in which agents must choose from a menu of contracts and decide among income-affecting actions with differing associated risk levels.

Assume that there is a risk-neutral agent who has previously taken out a loan; this can be thought of as an education loan. The agent now must choose a task to be performed in the current and following period to earn income that will be used to repay the loan and for consumption. In this environment, the choice of task can be thought of as the choice of a career and we use these two terms interchangeably.[6] There are two types of tasks available to the agent – an Easy task (E) and a Difficult task (D). There is no risk associated with choosing the Easy task; the agent completes this task successfully every time she attempts it.[7] Choosing the Difficult task entails risk, as the agent's performance in that task is uncertain, with a success rate denoted by $p \in [0, 1]$. The probability of success at the Difficult task is known to the agent.

Successfully performing the Easy task in a given period pays L, while successfully performing the Difficult task pays H, where $H > L > 0$. Assume that performance of the tasks is costless to the agent. From the perspective of an omniscient social planner who wishes to allocate agents to tasks to maximize total surplus, in any period, an agent with a success rate of p such that $p \geq \frac{L}{H}$ should choose the Difficult task, and an agent with a success rate of p such that $p < \frac{L}{H}$ should choose the Easy task. In other words, there exists a unique cut-off:

$$p^* = \frac{L}{H}$$

such that the surplus-maximizing choice of any agent with $p \geq p^*$ is the Difficult task.[8]

Both the requirement that agents repay their loans and the menu of available repayment options

[6] We study a two-period model, as two periods represent the minimum horizon over which the fixed repayment plan can have a shorter repayment period than the income-driven repayment plan, corresponding to the typical student loan repayment period under FR (10 years) being shorter than that for IDR (up to 25 years).

[7] Neither the theory nor the experiments require a risk-free Easy task. We assume it to simplify the theoretical model and eliminate one variable (success rate in the Easy task). See also footnote 10.

[8] Under the assumption of risk neutrality, the total surplus depends only on agents' earnings, as the loan repayment is just a transfer from the borrower to the lender. For notational simplicity, we set the discount rate equal to 1. Having two periods does not change the surplus maximizing cutoff for the success rate, $p^* = \frac{L}{H}$, since $p^2(2H) + 2p(1-p)H \geq 2L$ also implies the same threshold $p^* = L/H$.

may shift agents' career choices away from those that would be surplus-maximizing. We consider two repayment plans.[9] The first is the standard mortgage-style Fixed Repayment (FR) plan, which requires the agent to make a fixed payment of $k > 0$ in the first period. If the agent does not earn enough to make this payment, she defaults on the loan and is denied the opportunity to earn money in the second period. This feature of the model is an admittedly simplified means of incorporating the idea that defaulting on a loan imposes large financial costs on borrowers. If the agent successfully makes the required payment in the first period, she has fully paid off her loan and keeps all of her second period earnings for consumption. For a borrower who is repaying a loan under the FR plan, choosing the Easy career is the safe option, since $L > k$ and the borrower is certain to earn enough to make her required loan payment.[10] The two-period payoff for choosing the Easy task and the FR plan is:

$$\Pi_{E,FR} = L - k + L = 2L - k$$

On the other hand, the agent who repays her loan under the FR plan and attempts the Difficult career is taking a risk. If the agent fails to perform the Difficult task successfully in the first period, she earns nothing in the first period, defaults on her loan, and loses the opportunity to earn in the second period. The expected two-period payoff for choosing the Difficult task and FR plan is:

$$\Pi_{D,FR}(p) = p^2(2H - k) + p(1 - p)(H - k)$$

where the first term is the payoff received in the event that the agent succeeds in both periods (which has probability of p^2) and the second term is the payoff received in the event that the agent succeeds in period one and fails in period two (which has probability of $p(1 - p)$).

The second repayment plan we consider is Income Driven Repayment (IDR), which eliminates the

[9] Note that, consistent with evidence that recent college graduates are liquidity constrained (e.g., Rothstein and Rouse, 2011), we assume that the agent does not save for the future and cannot borrow against future expected earnings.

[10] In reality, the risk of unemployment means that new graduates may have no safe career option. The lack of a fully risk-free option is one of the motivations for the introduction of IDR in recent years. IDR also may encourage borrowers to pursue career paths that involve more risk. Since we are interested primarily in the extent to which available loan repayment options affect the choice of career, we have simplified the decision problem for participants in our experiment by making the Easy task risk-free. If both tasks in the experiment involved risk, the IDR option would become more desirable and the threshold probability for being assigned by a social planner to the Difficult task would fall, but the essence of our analysis would continue to hold.

risk of default. IDR requires the agent to pay back a set percentage (denoted by i) of her earnings in each of the two periods in the model.[11] If the agent fails at her chosen task in the first period (and thus has no earnings), she is not required to make a loan payment and is allowed to work and potentially receive earnings in the second period.

To highlight the particular features of students' decisions that are most relevant for the fundamental question of how borrowers would respond to having more versus less choice over repayment options, our description of IDR abstracts from many of the complexities in U.S. borrowers' current choices (e.g., time and information gathering costs associated with plan choice).[12] The IDR features of particular interest are: (i) IDR removes the risk of loan default due to low earnings, (ii) IDR may lower the return to higher-paying jobs by linking payments to earnings, and (iii) IDR commonly results in a longer repayment period than FR. Both the model and the experiment are structured to reflect these features. Borrowers will pay more on average under IDR than under FR, as lower payments early in a borrower's career lead to larger total interest payments over the longer IDR payment term.[13] This can be thought of as the cost of being insured from default under IDR. The simplified IDR plan in our experiment is also similar to a so-called "human capital contract" or "income-share agreement" (which can be thought of as a fixed-length IDR contract), in that borrowers are required to pay a share of their income for a set length of time, regardless of the amount repaid in the initial period.[14] To simplify the design, we do not allow subjects to repay the loan in full early or switch plans between periods.[15]

[11] Since the IDR plan is offered to remove the risk of loan default and there is no risk of defaulting when an agent chooses the Easy task, we set i such that a borrower choosing the Easy task will be indifferent between the FR and IDR plans. This assumption is not required for the model's predictions, but making it allows us to focus on the task choice of moderate ability borrowers in an environment that offers varied repayment options.

[12] Appendix A includes detailed descriptions of the repayment options currently available to U.S. student borrowers.

[13] The reason that IDR plans typically lead to a longer period of repayment is that periods of low income lead to lower payments. A borrower who had very high income relative to student debt early in their careers could end up repaying their loan sooner under IDR, and as a result, pay less in total (principal plus interest) than borrowers with the same debt and income path who choose FR, but this is not typical. The logic of our setup is applicable to situations in which borrowers start their careers with lower earnings but, depending on career choice, either experience high earnings growth with some probability (equivalent to the Difficult task) or continue to have low but certain earnings (equivalent to the Easy task).

[14] In recent years, several universities have begun to offer such options as an alternative to federal student loans. See Appendix A for additional details.

[15] In the U.S. federal student loan context, borrowers are allowed to switch between plans, but switching is costly. Extending the model to allow for costly switching would not be theoretically difficult, but incorporating costly switching in the experiments would have required participants to make an additional decision (i.e., whether to switch or not) and to consider more than two periods. Since our main research question is not about rational switching between loan repayment plans, we chose to shut down that channel in our setup.

The expected two-period payoff from choosing the Difficult task under IDR is:

$$\Pi_{D,IDR}(p) = p^2(2H(1-i)) + 2p(1-p)H(1-i) = 2pH(1-i)$$

The first term in this expression is the payoff received in the event that the agent succeeds in both periods (which has probability p^2) and the second term is the payoff received in the event that the agent succeeds in either period one or period two but not in both (which has probability $2p(1-p)$). Note that if she fails at the Difficult task in both periods, the agent earns zero and repays zero. The payoff for the Easy task under IDR is:

$$\Pi_{E,IDR} = 2L(1-i)$$

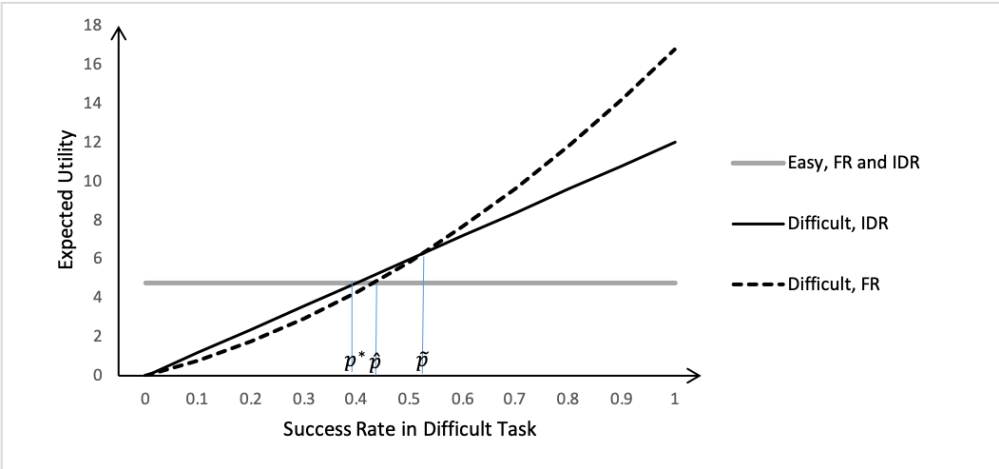
A lender seeking to maximize revenue would like to set a high value of i. For lower-ability borrowers who choose the Easy task however, the insurance provided by IDR has no value and thus, it would penalize such borrowers to set i so high that they paid more under IDR than they would have paid under FR. The highest that i can be set without making agents who choose the Easy task worse off under IDR is to set it at the level that makes such agents indifferent between the IDR and the FR plans, i.e., to set $i = \frac{k}{2L}$. We set i in this way so that we can focus on the behavior of agents for whom the insurance provided by IDR has value and could affect their choice of task.

2.1 Predictions from the Standard Theory

Figure 1 illustrates the predictions of the standard theory and shows the cut-offs in the probability of success at the Difficult task that would be used by agents for making their task and plan choices.

A risk-neutral agent maximizing her expected return will choose the Difficult task when its expected payoff exceeds the payoff for the Easy task. Under IDR, the expected two-period payoff from choosing the Difficult task will equal the payoff from choosing the Easy task at the same threshold probability that the omniscient social planner would use as the surplus-maximizing threshold for assigning borrowers to the Difficult task (i.e., $\Pi_{D,IDR}(p) = \Pi_{E,IDR}$ at $p = p^*$). In other words, under IDR, risk-neutral borrowers will make the same decision about which task to perform that the social planner would have chosen for them.

Figure 1: Expected Utility of Tasks by Loan Repayment Plan



Notes: The figure assumes evaluation of the options by an agent who seeks to maximize expected monetary returns. p^* denotes the threshold probability at which an expected payoff maximizer would switch from the Easy task to the Difficult task when IDR is available. $\hat{p}$ denotes the threshold probability at which an expected payoff maximizer would switch from the Easy task to the Difficult one when IDR is not available. $\tilde{p}$ denotes the threshold probability at which an expected payoff maximizer performing the Difficult task would switch from IDR to FR when both plans are available.

Under FR, agents are indifferent between the two tasks when $\Pi_{D,FR}(p) = \Pi_{E,FR}$, which occurs at the threshold probability $\hat{p}$ in Figure 1, and is higher than the surplus maximizing threshold p^*, resulting in fewer than the surplus-maximizing number of people choosing the Difficult task. Intuitively, a borrower who defaults on her loan loses the opportunity to earn in the second period, meaning that the risk of default lowers her expected two-period payoff relative to that from choosing the Easy task. This is partially offset by the risk of default also reducing the amount she expects to repay on her loan. On net, however, the risk of default reduces the payoff expected from choosing the Difficult task relative to that from choosing the Easy task.[16]

The switching threshold, $\tilde{p}$, is the probability of success in the Difficult task at which the expected return to the Difficult task under IDR equals the expected return under FR (i.e., $\Pi_{D,IDR}(p) = \Pi_{D,FR}(p)$ at $p = \tilde{p}$). Above this threshold, an agent performing the Difficult task has a higher expected return if she chooses FR. Proposition 1 below summarizes these predictions.

Proposition 1. *When both plans are available, an expected return maximizing agent chooses her task and repayment plan as follows:*

[16]The proof of this statement is part of the proof of Proposition 1 and it is provided in Appendix B.

$$(Task, Plan)(p) = \begin{cases} (Easy, EitherPlan), & if \ p < p^* \\ (Difficult, IDR), & if \ p^* \leq p < \tilde{p} \\ (Difficult, FR), & if \ \tilde{p} \leq p \end{cases}$$

2.2 Possible Menus of Contracts with IDR

At present, U.S. borrowers can choose between IDR and FR when repaying their student loans. Some have suggested that eliminating FR would benefit borrowers. If such a policy were to be enacted, the shift from a richer set of plans to a smaller set due to the elimination of FR would result in a transition period where new borrowers would still know that FR had been an option in the past. For such new borrowers, the elimination of FR would be more salient than for borrowers in a regime when IDR had been the only option for longer time.[17] Thus, we focus on three scenarios representing the status quo (FR and IDR), the longer-run regime with only IDR available, and the transition period from a menu with both options to a menu with only IDR:

Choice (C): Both the FR and the IDR plans are available and borrowers are free to choose between the two options.

No Choice (NC): Borrowers are offered only the IDR plan.

No Choice with a Reference Group (NCR): Both the FR and the IDR plans are available to some borrowers, but the agents of interest do not have a choice and are assigned to the IDR plan. The remaining agents are offered a choice between FR and IDR. Members of both groups are aware of the choices (or lack thereof) provided to members of the other group.

Proposition 1 predicts that, under all three scenarios, the threshold probability of success at which the borrower chooses the the Difficult task is determined by the intersection of expected payoffs to the Easy and Difficult tasks under IDR.[18] The existence of the FR plan does not determine this cutoff but only determines which among the agents choosing the Difficult task will select IDR and

[17] The fact that the elimination of the FR option is under consideration in the student loan repayment application makes it the more relevant option to consider, but we could symmetrically have studied different ways to introduce a menu with only FR. From a menu-design perspective, this also could be an interesting option to consider.

[18] Depending on the agents' attitudes towards risk the exact value of the cutoff may be different from p^*. As we discuss in Section 5, however, risk aversion would not lead to any differences between the C, NC, and NCR settings in task choice for moderate-ability borrowers.

which will select FR (if available). Hence, as long as IDR is offered to borrowers, the same agents should choose the Difficult task independent of what other plans are presented on the menu of options. In other words, the standard theory predicts no difference in the number and type of agents choosing the Difficult task in settings C, NC, and NCR. Therefore, based on Proposition 1, we have the following hypothesis:

Hypothesis 1: The same proportion of borrowers will choose the Difficult task in settings C, NC, and NCR.

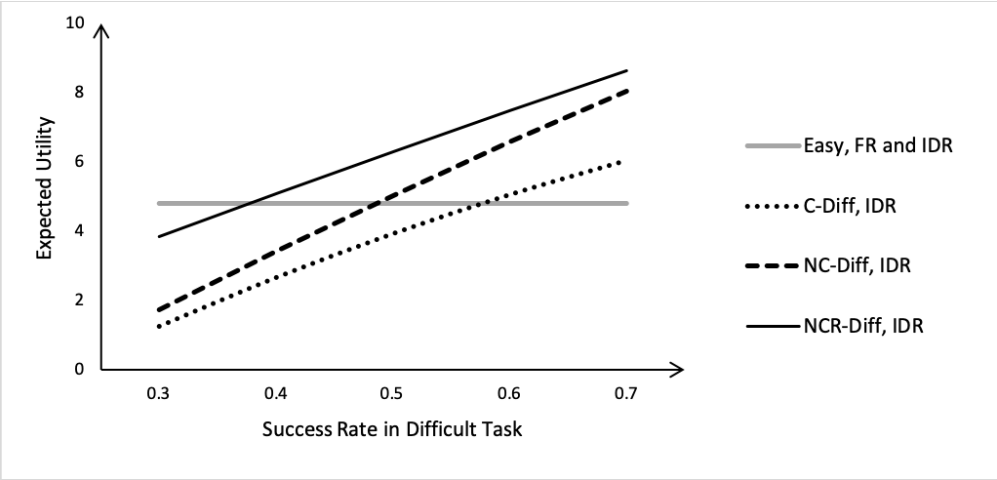
2.3 Menu Dependent Evaluation of Loan Repayment Plans

For any of several reasons, if borrowers have menu-dependent preferences, they may appreciate an alternative differently in the context of a smaller versus a larger set of options. As examples, a preference for simplicity or the anticipation of regret over choosing an option that later turns out to be sub-optimal could generate utility-diminishing references to other available options. In our context, for an agent who chooses the Difficult task, selecting IDR rather than FR may cause regret if she succeeds at the Difficult task and realizes she did not need the insurance provided by IDR. Referring back to Figure 1, if having FR as a menu choice diminishes the utility of IDR, someone evaluating the Difficult task will place a higher value on IDR in setting NC than in setting C. In this case, we would expect to see a lower threshold probability for switching to the Difficult task in setting NC than in setting C.

If borrowers value IDR more in the absence of FR, making the elimination of FR more salient may further affect their choice of task. For example, if a borrower is sufficiently sophisticated that she can predict the disutility she would experience if offered a larger menu of contracts, she may feel gratitude when she sees a smaller menu. This motivates the NCR setting. Whereas the agents in the NC setting do not know that the FR option might exist, it is obvious to the non-choosing borrowers in the NCR setting that they are being denied that option. If borrowers appreciate being offered a smaller menu, they may evaluate IDR even more highly in NCR than in NC. This would encourage more borrowers to choose the Difficult task and we would expect to see a lower threshold probability for switching to the Difficult task in the NCR setting compared to the NC setting.

These potential outcomes are illustrated in Figure 2. As shown in the figure, if agents experience

Figure 2: Behavioral Shifts in Expected Utility of Difficult Task under IDR



Notes: The figure is based on a decision model that allows for regret and gratitude. Model details are provided in Appendix B; linear regret and gratitude functions with parameters of 0.8 and 0.2, respectively, are used in the figure.

disutility from a richer menu, the evaluation of IDR will be diminished in setting C relative to setting NC. The relatively higher preference for choosing IDR with a smaller menu is represented by the higher expected utility curve for NC than for C. Further, if agents receive additional utility when they are made aware of the elimination of the FR option, IDR will be valued more highly in the NCR setting than in the NC setting. The gratitude resulting from making the elimination of FR salient is represented by the utility curve for NCR being the highest in the figure.

Shifts in the evaluation of the Easy task should be minimal in our settings. This is because the repayment levels under FR and IDR are equal for agents choosing the Easy task, so that agents who find it optimal to choose the Easy task should not be affected by the menu of contracts. That idea is illustrated by a fixed horizontal line in Figure 2.

If the changes in the threshold probability for choosing the Difficult task occur as suggested by Figure 2, there are several implications:

- **Task switching cutoffs:** The highest cutoff probability for switching from the Easy to the Difficult task will occur in C and the lowest cutoff will occur in NCR.
- **Percentage of borrowers choosing the Difficult task:** The highest percentage of borrowers choosing the Difficult task will be observed in NCR, and the lowest percentage will be ob-

served in C.

- **Behavior of borrowers with mid-range skills:** In all three cases, borrowers with a very high (very low) rate of success in the Difficult task will choose the Difficult (Easy) task. The treatment effects due to behavioral influences, if present, will occur for borrowers with mid-range success rates.

As discussed in Section 4, all of these predictions are observed in our experimental data.

Figure 2 is inspired by intuitive behavioral concerns and, as such, is only suggestive. Depending on the nature of borrowers' menu preferences, the shifts in the utility curves could look different. For example, if a borrower seeks to maximize her expected monetary return but dislikes it if her choices are more limited than those available to some of her peers, she could attach the same value to IDR in C and NC. Contrary to our experimental findings, that would imply the same switching cutoff in C and NC, but a higher cutoff in NCR.

In our experiments, we offer subjects the menus of choices implied by the C, NC and NCR environments and observe their behavior. In Section 5, based on the observed differences in subjects' behavior across the three environments, we revisit a number of potentially relevant behavioral theories and discuss which provide predictions that are most consistent with our findings.

3 Experiment Setup and Procedures

In the experiment, we set the payment L (for performing the Easy task) equal to \$4 and the payment H (for successfully performing the Difficult task) equal to \$10. The fixed loan repayment amount under the FR plan, k, is set at \$3.20. The percentage of pay-back under IDR, i, is set at 40%, which implies a payment of \$1.60 per period for an agent performing the Easy task and \$4.00 per period for an agent successfully performing the Difficult task. As was the case in the model presented in the previous section, the agent who chooses the Easy task should be indifferent between FR and IDR. While the total loan payment under IDR for agents performing the Easy task is \$3.20 (equal to the FR payment), the total loan payment for agents performing the Difficult task can be \$0, \$4,

or \$8 depending on the outcomes that are realized.[19]

Up to four different combinations of task and loan repayment plan choices are available to an agent. Plugging the parameter values specified for the experiment into the model from Section 2, the two-period payoff for task X and loan plan Y generates the following expected return, $\Pi_{X,Y}$, for $X \in \{\text{Easy}, \text{Difficult}\}$, $Y \in \{\text{FR}, \text{IDR}\}$, and a success rate of p at the Difficult task:

$$\Pi_{E,FR} = (4 - 3.2) + 4 = 4.8$$

$$\Pi_{D,FR}(p) = p^2(20 - 3.2) + p(1-p)(10 - 3.2) = 10p^2 + 6.8p$$

$$\Pi_{E,IDR} = 4(1 - 0.4) + 4(1 - 0.4) = 4.8$$

$$\Pi_{D,IDR}(p) = p^2[20(1 - 0.4)] + 2p(1-p)[10(1 - 0.4)] = 12p$$

Figure 1 displays the expected payoffs under FR and IDR as a function of the probability of success at the Difficult task. By design, the expected payoff for an agent who chooses the Easy task is the same under FR and IDR. Given the parameter values we have chosen, according to Proposition 1 and as illustrated in Figure 1, there are two critical levels for p: $p^* = 0.40$ and $\tilde{p} = 0.52$. Any agent whose probability of success in the Difficult task is between 0.40 and 0.52 earns the highest expected payoff by choosing the Difficult task and IDR. For these agents, the insurance provided by IDR is more valuable than the possibility of making smaller loan payments under FR. Agents whose probability of success in the Difficult task is greater than 0.52 will earn the highest expected payoff by choosing the Difficult task and FR (if available). For these agents, the insurance provided by IDR is not as valuable as making lower loan repayments under FR.

We administered the three treatments described in Section 2—Choice (C), No Choice (NC), and No Choice with a Reference Group (NCR). We are primarily interested in whether the same proportion of subjects in all the treatments choose the Difficult task, i.e., whether the threshold probability for switching from the Easy to the Difficult task is the same in each treatment.

[19] Our parameter selection implies that a borrower who performs the Difficult task under IDR and succeeds in the first period will pay \$0.80 more in the first period than the total required FR payment. In practice, some, but not all, IDR plans cap payments at the FR payment amount, a feature that minimizes switching between plans. To simplify our setup, we do not cap payments and also do not allow borrowers to switch between plans. The same result could have been obtained by imposing an explicit switching cost of \$4.80 or more.

Nineteen sessions were conducted in the Experimental Economics Laboratory at the University of Maryland in 2016. One of the three treatments was administered during each of these sessions – Treatment C (Choice) (7 sessions), Treatment NC (No Choice) (6 sessions), and Treatment NCR (No Choice with a Reference Group) (6 sessions). A total of 91, 90 and 91 subjects participated in Treatments C, NC, and NCR, respectively.[20] No subject participated in more than one session. Instructions were provided to subjects in the form of printed handouts and also were read aloud to ensure that all participants received the same information.[21] The experiments were programmed and conducted with the software z-Tree (Fischbacher, 2007). Each session lasted approximately one hour and subjects earned $14.50 on average. The characteristics of our experimental subject pool align closely with those of the University of Maryland undergraduate student body in terms of gender, age, SAT results, student loan debt, and financial literacy (see Appendix C for details).

All of our experimental sessions were divided into three parts. Subjects received the instructions for each part of the session at its beginning, so that those engaged in the earlier parts of the experiment did not know what would come later. In Part 1, which was the same for all three treatments, each subject performed 30 Easy tasks and 30 Difficult tasks.[22] Each Easy task consisted of typing a five-letter word that was shown on the subject's screen. Subjects had 20 seconds to type each word and they were paid $0.10 per correctly typed word. Each Difficult task required subjects to answer a question from a sample SAT test. Subjects had one minute to answer the question, and they were paid $0.10 for each question they answered correctly. At this point, subjects did not know exactly how their performance on these tasks would affect their later earnings, but they were told that performing better would have a positive and significant impact on their earnings in the next part of the experiment.

At the end of Part 1, subjects' computer screens showed them how many of the 30 questions of each task they had answered correctly. Figure 3 displays the distribution of the share of Difficult task questions subjects answered correctly. Recall that, in any given period, when $p \geq 0.40$, choosing the Difficult task generates the highest expected earnings. More than 80% of participants were able

[20] One additional subject was recruited for Treatment C, but left in the middle of a session. We exclude this participant from all analyses.

[21] The instructions for the experiment are provided in Online Appendix D.

[22] The instructions given to subjects referred to these as Type A tasks and Type B tasks rather than as Easy tasks and Difficult tasks.

Figure 3: Distribution of Success Rate in the Difficult Task

to answer at least 40% of the Difficult task questions correctly.

The subjects next received the instructions for the second part of the experiment, which varied according to the treatment for the subject's session. Subjects learned that they had to take out a $2 loan to participate in Part 2 of the experiment, that they would have the opportunity to earn income over two periods, and that this income would be used to repay their loan. They were told how their earnings would be determined in each period depending on whether they chose to perform the Easy task or the Difficult task and also how their loan repayment amount would be determined depending on their loan repayment plan (either chosen by the subject or assigned to them, depending on the treatment). The subjects then were asked to choose the type of task that would determine their earnings and, in the case of Treatment C (and for one subject in each of the Treatment NCR sessions), to choose their loan repayment plan.

The subjects did not perform their chosen type of task again in Part 2. Instead, they were told that, for each earnings period, the computer would randomly choose one of the questions that they had already answered in Part 1 according to their choice of task, and that their performance on the randomly selected question would determine their earnings in the period. For example, suppose that a subject chose to base her earnings on her performance in the Difficult task. In the first earnings period, the computer would select one Difficult question out of the 30 she had answered in Part 1 as the basis for determining her earnings. If the subject had answered that question correctly, she would earn $10 and make her loan payment from those earnings. Assuming

the borrower avoided default in the first period, the same procedure would be followed in the second period. At the point when the subject was asked to decide which type of task would be used to determine her earnings, her screen displayed her Part 1 performance so that she knew the exact probability of success for both the Easy and the Difficult tasks before making her choice. We did not ask subjects to perform their chosen type of task again in Part 2 because we wanted them to be certain about their chances of success. This was intended in part to allow us to rule out the influence of over- and under-confidence biases regarding their own skill level on subjects' decisions.[23]

Our treatments are distinguished by the menu of loan repayment options available in the session. The instructions for Part 2 provided the details of the repayment plans available in each subject's session. In Treatment C, both the FR and the IDR option were described. In Treatment NC, only the IDR option was described. In Treatment NCR, both the FR and the IDR options were described to all subjects and subjects were told that some participants would be allowed to choose between the FR or the IDR plan, while the remainder of the subjects would have no choice and be assigned to the IDR plan. At the time the instructions regarding the plans were given, a subject did not know if she would be a choosing subject or a non-choosing subject. Participants in the NCR sessions were told that the choosing and non-choosing subjects were randomly determined and that all participants had an equal chance of being a choosing subject independent of their Part 1 performances.[24] Since our interest in Treatment NCR lies with the behavior of non-choosing subjects in the presence of choosing subjects, we assigned only one choosing subject in each session; all other participants in each Treatment NCR session were non-choosing subjects and our analysis makes use only of the data for the non-choosers. Once the instructions for Part 2 had been provided, each Treatment NCR subject's screen displayed whether they were allowed to choose their repayment plan. Choosing subjects then decided on their loan repayment plan and all subjects decided on their task type.

A subject's task choice applied to both periods. To ensure that subjects understood the decision

[23] Earnings for those choosing the Difficult task are based on the given subject's objective probability of success in that task and subjects know this to be the case. Nevertheless, some subjects still may be using some probability weighting function in their evaluations, as in prospect theory. Such deviations from expected utility theory would not affect either the predictions of the model or our behavioral conjectures so long as agents' probability weighting functions are not affected by the treatment to which they are assigned.

[24] This clarification was emphasized to avoid a subject interpreting her assignment to non-choosing as an indication that the experimenter wanted her to receive the insurance provided by IDR, which could have been viewed as an encouragement to choose the Difficult task.

about task and plan, subjects were given a quiz that presented them with scenarios and asked them to calculate the earnings, loan payments, and net payoffs associated with those scenarios. A subject could not proceed until they had answered the quiz questions correctly. After the subjects made their task choices and (when allowed) plan choices, the computer reported the subjects' performance on the randomly selected task for period 1, the randomly selected task for period 2, their earnings in each period, and loan repayments according to their loan repayment plan. This concluded Part 2 of the experiment.

In Part 3, we elicited subjects' risk preference using a method devised by Holt and Laury (2002).[25] This was the last incentivized activity of the experiment. After that, the subjects completed a short questionnaire (available in Appendix D) that included questions about gender, age, student debt, the subject's self-assessed willingness to take risk (measured on a scale from 0 for the most unwilling to 10 for the most willing), and SAT and/or ACT scores, together with two questions designed to assess subjects' financial literacy.

4 Results

Table 1 reports the average success rates of subjects assigned to the three different treatments on the 30 Difficult tasks completed in Part 1 of the experiment. As intended, in all three treatments, participants' success rates on the Easy task were very high. In each treatment, however, a handful of participants did not succeed at the Easy task 100% of the time. Specifically, 2 out of 91 subjects in Treatment C, 3 out of 90 subjects in Treatment NC, and 3 out of 91 subjects in Treatment NCR made at least one error when completing the Easy task. Recall that the theoretical model in Section 2 assumed that the Easy task was risk-free. This allowed us to focus on the probability of success in the Difficult task as the only factor in the decision problem that varied across subjects. For consistency with the theoretical model, we exclude the 8 subjects who did not perform the Easy task with 100% success from all analyses. Participants who were given a choice over repayment plans in Treatment NCR (6 subjects) are also excluded from Table 1 and the remainder of our

[25] Appendix D includes a screen shot of the ten binary choice problems that we used for eliciting the risk preferences. In each problem, subjects chose between an Option A and an Option B, with the problems designed so that Option B becomes gradually less risky relative to Option A as one moves from the first to the tenth problem. More risk-averse decision makers should switch to Option B at a later problem in the sequence.

analyses, as we are interested only in the behavior of the non-choosing subjects in this treatment. As shown in Table C.1. in Appendix C, these restrictions do not substantially affect the average success rate in the Difficult task either overall or by treatment group.

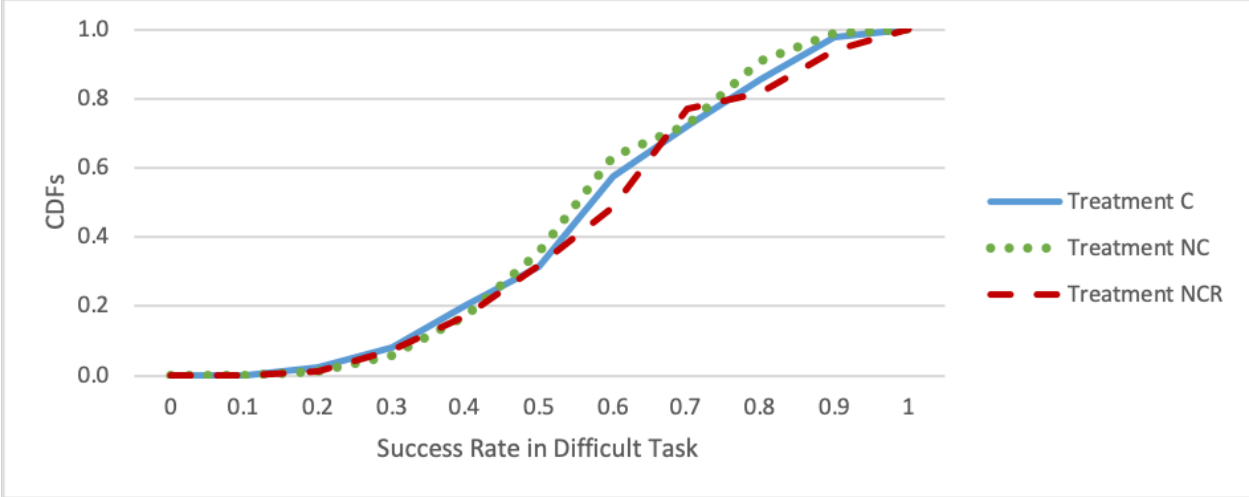
Table 1: Average Success Rate by Task and Treatment

	Treatment C	Treatment NC	Treatment NCR	All
Success Rate in Difficult Task	0.588	0.578	0.603	0.590
	(0.188)	(0.176)	(0.195)	(0.186)
Observations	89	87	82	258

Notes: Standard deviations are in parentheses. The sample excludes the 8 subjects with less than 100% success on the Easy task and the 6 choosing subjects in Treatment NCR.

The distributions of participants' success at the Difficult task also do not vary across treatments. Figure 4 shows the cumulative distributions of the Difficult task success probability in each of the three treatments based on the same samples as Table 1. Kolmogorov-Smirnov tests do not reject the hypothesis that the distributions are the same (p-values from all pairwise comparisons are greater than 0.5). Hence, we deem our assumption that the subject pools participating in the different treatments did not differ from each other in terms of their ability to perform the Difficult task to be reasonable.

Figure 4: Cumulative Density Functions of the Success Rate in the Difficult Task in Treatment C, NC, and NCR



4.1 Switching from the Easy to the Difficult Task

Hypothesis 1 states that, under the standard theory without any behavioral biases and assuming a common distribution of success rates in the Difficult task across treatments, the share of subjects choosing the Difficult task should be equal across treatments. The actual percentages of subjects choosing the Difficult task were 61.4%, 68.2%, and 81.6% in Treatments C, NC, and NCR, respectively (with $p < 0.05$ for all pairwise comparisons), a pattern that is at odds with Hypothesis 1. These aggregate percentages are reported in the fourth row of Table 2.

We conjecture that the behavioral concerns hinted at by the overall differences across treatments in the share of subjects choosing the Difficult task are driven by changes in the behavior of subjects with mid-range success rates on the Difficult task (as indicated by Figure 2). There are multiple ways to define what constitutes a mid-range success rate. We consider participants to have mid-range skills if their probability of success in the Difficult task falls between 0.25 and 0.75, an interval that includes $p = 0.40$, the success rate at which a subject seeking to maximize her expected payoff should switch to the Difficult task.[26] As can be seen in Table 2, in all treatments, subjects in our experiments with a very low probability of success (at or below 0.25) pick the Easy task 100% of the time and subjects with a very high probability of success (at or above 0.75) pick the Difficult task 100% of the time. All of the differences in behavior across treatments occur among participants with moderate ability. The lowest percentage of subjects of mid-range ability choose the Difficult task under Treatment C (50.7%) and the highest percentage do so under Treatment NCR (81.7%).

Proposition 1 predicts that, absent behavioral biases, there should be a single threshold for the probability of success in the Difficult task across all treatments such that any subject with a success rate above this threshold should choose the Difficult task. Differences across treatments in the share of subjects choosing the Difficult task could be driven by the differences in the task switching threshold. The fact that the lowest percentage of subjects choose the Difficult task in Treatment C and the highest percentage of subjects do so in Treatment NCR is consistent with the conjecture that the task-switching threshold is lowest in Treatment NCR and highest in Treatment C. The fact that changes are present only among subjects with mid-range skills offers further corroboration for

[26] The general pattern shown in Table 2 is robust to different choices for the range of p used to classify subjects as having mid-range skills. Table C.2 in Appendix C shows similar results using mid-range skill boundaries of 0.33 and 0.66.

Table 2: Percentage of Subjects Choosing Difficult Task, by Treatment and Success Rate

Success Rate in Difficult Task	Treatment C	Treatment NC	Treatment NCR
$p \leq 0.25$	0 %	0 %	0 %
$0.25 < p < 0.75$	50.7 %	61.9 %	81.7 %
$p \geq 0.75$	100 %	100 %	100 %
All	61.4 %	68.2 %	81.6 %

Notes: The sample excludes the 8 subjects with less than 100% success on the Easy task and the 6 choosing subjects in Treatment NCR. See Section 3 for descriptions of the three treatments. p represents the probability of success at the Difficult task.

this conjecture.

To further explore the differences across treatments, we estimate the threshold probability for choosing the Difficult task for each treatment. Note that we would expect the perfect step function suggested by Proposition 1 to appear in the data only if all subjects are homogeneous such that they are maximizing an identical utility function; in reality, the threshold dividing those who choose the Difficult task from those who choose the Easy task is likely to be fuzzier. We therefore look instead for the threshold probability of performing the Difficult task successfully such that more than half of agents with any probability above the threshold choose the Difficult task.

We first estimate these thresholds via logistic regressions in which we relate choice of the Difficult task to the probability of performing the Difficult task correctly; results are shown in Table 3. Formally, the logistic function is $\frac{e^{(a+bx)}}{1+e^{(a+bx)}}$, and thus, it takes the value of $\frac{1}{2}$ when $a + bx = 0$. In our case, the variable x is the probability of performing the Difficult task correctly, and we are interested in identifying the threshold value of x such that subjects have a 50% probability of taking either action (Cabral et al., 2014). This threshold x^* can be found by setting $x^* = -\frac{a}{b}$, where a is the constant term and b is the coefficient estimated for the variable x (the success rate at the Difficult task) in Table 3 regressions. This methodology yields estimates of the threshold values for the three treatments of $p^C = 0.54$, $p^{NC} = 0.45$, and $p^{NCR} = 0.38$. The implied ranking of the estimated cutoffs for being more likely than not to choose the Difficult task is consistent with the expected utility from choosing IDR being the lowest in Treatment C, higher in Treatment NC and the highest

of all in Treatment NCR, in line with the behavior suggested by Figure 2.

Table 3: Logistic Regressions Relating Choice of Difficult Task to Success Rate in the Difficult Task, by Treatment

	Treatment C	Treatment NC	Treatment NCR
Success Rate in Difficult Task	11.90^{***}	9.34^{***}	15.08^{***}
	(2.510)	(2.181)	(3.904)
Constant	-6.42^{***}	-4.19^{***}	-5.73^{***}
	(1.434)	(1.180)	(1.727)
Observations	89	87	82
Log Likelihood	-36.47	-39.62	-19.25

Notes: Success Rate in Difficult Task is the proportion of the 30 Difficult tasks in the first part of the experiment completed successfully by the subject. The sample excludes the 8 subjects with less than 100% success on the Easy task and the 6 choosing subjects in Treatment NCR. Standard errors in parentheses; *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

As a robustness check, we also calculate threshold probabilities for choosing the Difficult task using the methodology of Cabral et al. (2014). There are two ways to deviate from the step function – either choosing the Difficult task when the probability of success is below the cutoff or choosing the Easy task when the probability of success is above the cutoff. We identify the minimum number of observations that would need to be eliminated to generate a data set in which the task choice becomes a step function. When we use this cutoff calculation strategy, we estimate $p^C \in [0.57, 0.60]$ by eliminating 15 out of 89 observations; $p^{NC} \in [0.41, 0.43]$ by eliminating 20 out of 87 observations; and $p^{NCR} \in [0.27, 0.33]$ by eliminating 8 out of 82 observations. This approach thus yields the same ranking of the cutoffs across treatments as the previous cutoff calculations based on the logistic regression coefficients. Again, this finding is consistent with the shifts in the expected utility of choosing IDR and the Difficult task illustrated by Figure 2. Assuming that the utility of the Easy task is the same in all three treatments, these results align with an upward shift in the expected utility of choosing IDR in Treatment NC relative to Treatment C and a further upward shift in the expected utility of choosing IDR in Treatment NCR relative to the other two treatments.

In Table 4, we further investigate the robustness of these findings to accounting for the effect of attitudes towards risk and other subject characteristics on task choice. As in Table 3, the dependent variable in these logistic regressions is whether the subject chose the Difficult task. The pooled sample used for Table 4 includes all subjects for whom we have the information on risk attitudes and

other individual characteristics needed to estimate all of the included specifications. The model in column (1) includes only treatment dummies and the success rate in the Difficult Task; controls for subjects' willingness to take risks and other characteristics are added in the later columns. In all of the regressions, consistent with subjects' behavior being rational, the coefficient on Success Rate in the Difficult Task is positive and significant. As expected given the results already presented, the model in column (1) implies that, holding constant a subject's probability of completing the Difficult task successfully, those in Treatment C (the omitted treatment group) are least likely, and those in Treatment NCR the most likely to choose the Difficult task.

Our two measures of risk attitudes are introduced in the next three columns —the Holt-Laury Switch measure in column (2), the subject's self-assessment of their willingness to take risk in column (3), and both together in column (4). The point estimates of the coefficients on these variables have the expected sign – negative for the Holt-Laury measure, which has larger values for people who are less willing to take risk, and positive for the self-assessment measure, which has larger values for people who are more willing to take risk – though none are statistically significant in any of the models. More important for our purposes, their inclusion has a negligible effect on the estimated treatment dummy coefficients.

Measures of various other subject characteristics are introduced in the next two columns – gender, age in years, and raw SAT score on a 2400 point scale in column (4) and those same variables plus the number of financial literacy questions answered correctly (0, 1 or 2) and whether the subject had any student loan debt in column (5). None of the coefficients on any of these variables is statistically significant and, again, their introduction has a negligible effect on the treatment dummy coefficients.

Finally, we calculate the share of subjects in each treatment who choose the surplus maximizing task. Recall that, for the parameter values in this experiment, the surplus-maximizing allocation of subjects to tasks occurs when subjects with a success rate in the Difficult task of 0.4 or higher choose the Difficult task and those with lower success rates choose the Easy task. If subjects tend to be risk averse, as suggested by the signs of the estimated coefficients on the risk aversion variables (even though insignificant) in Table 4, we might expect the success probability cutoff for choosing the Difficult task to be higher. The share of subjects choosing the surplus-maximizing task is lowest

Table 4: Logistic Regressions Relating Choice of Difficult Task to Treatment, Success Rate in the Difficult Task, Risk Attitudes and Other Characteristics

	(1)	(2)	(3)	(4)	(5)	(6)
NC Treatment	0.948**	0.941**	0.964**	0.956**	1.005**	0.981**
(yes=1)	(0.477)	(0.480)	(0.482)	(0.485)	(0.499)	(0.500)
NCR Treatment	2.677***	2.645***	2.698***	2.651***	2.549***	2.567***
(yes=1)	(0.635)	(0.642)	(0.636)	(0.643)	(0.662)	(0.666)
Success Rate in Diff. Task	13.52***	13.42***	13.82***	13.71***	13.65***	13.89***
	(2.032)	(2.040)	(2.094)	(2.107)	(2.286)	(2.331)
Holt-Laury Switch		-0.186		-0.192	-0.166	-0.165
		(0.125)		(0.125)	(0.131)	(0.130)
Willingness to Take Risk			0.130	0.138	0.140	0.134
			(0.0918)	(0.0939)	(0.0997)	(0.100)
Female (yes=1)					-0.0854	-0.143
					(0.467)	(0.482)
Age (years)					-0.181	-0.152
					(0.153)	(0.161)
SAT(600-2400)					0.0003	0.0005
					(0.0009)	(0.0009)
Financial Literacy (0,1, or 2)						-0.215
						(0.337)
Loan (yes=1)						0.0346
						(0.437)
Constant	-7.622***	-6.292***	-8.347***	-7.001***	-4.014	-4.811
	(1.223)	(1.474)	(1.377)	(1.596)	(3.732)	(3.954)
Observations	216	216	216	216	216	216
Log Likelihood	-74.31	-73.16	-73.27	-72.04	-71.01	-71.00

Notes: The sample excludes 8 subjects with less than 100% success on the Easy task, 6 choosing subjects in Treatment NCR, and 42 subjects who did not provide information on all of the specified control variables. Holt-Laury Switch is an incentivized measure of attitudes toward risk with values from 1 to 10, where a larger index is associated with greater risk aversion. Willingness to take risk is the subject's self-evaluation on a scale from 1 to 10. Financial literacy is the number of financial literacy questions answered correctly (0, 1 or 2); see Appendix D for specific questions. The loan variable measures whether the subject had ever received a student loan while at the University of Maryland. Standard errors in parentheses; *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

in Treatment C (70.8%), higher in Treatment NC (75.9%), and highest in Treatment NCR (87.8%). The deviation from the surplus-maximizing allocation is due mainly to subjects with success rates higher than 0.4 choosing the Easy task. Among subjects with a success rate in the Difficult task greater than 0.4, some 32.4% of those in Treatment C chose the Easy task. That share is smaller in Treatment NC (23.3%) and just 8.6% in Treatment NCR.

5 Behavioral Models

Taken as a whole, our findings are strongly inconsistent with the predictions of the standard theory. We turn now to a discussion of behavioral biases that could lead to changes in subjects' choices in response to changes in the menu of loan repayment plans they are offered and contribute to the treatment effects we observe in the data.

Risk Aversion:

Recall that Proposition 1 relied on the assumption that agents were risk neutral. Risk aversion is an additional factor that could affect the choice between the Easy and the Difficult tasks. Because performance on the Difficult task is uncertain, we would expect the Difficult task to be less desirable for agents who are more risk-averse. On its own, however, risk aversion should affect the expected utility of the Difficult task under IDR equally in all of the treatments. Although we would expect risk aversion to raise the cutoff probability of success required to induce an agent to switch to the Difficult task relative to that for a non-risk-averse agent, there is no reason to think that the relative position of the cutoffs for the different treatments should be affected. Thus, the pattern of treatment differences we observe cannot be explained by risk aversion alone.

Procedural Fairness and Envy:

Procedural fairness could be a behavioral concern relevant to our setup. A subject may ask herself whether she was treated fairly under the procedures in place and be envious when she realizes that she was not given the same opportunities that were provided to others.[27] In our setup, all agents in Treatments C and NC were given the same choices, meaning that all participants were treated

[27] The literature documents that an envious agent may be willing to pay in order to reduce the payoff to others (Zizzo and Oswald, 2001) and anticipation of envy may lead to sub-optimal behavior (Mui, 1995).

equally under the procedures in these sessions. Only Treatment NCR resulted in differences in how subjects were treated, as some are forced into IDR while knowing that others were given the option to choose FR. In this environment, an agent who chooses the Difficult task and performs it successfully could realize that an agent who completed the same task under FR would have received a higher payoff – an opportunity she was denied. This could lead the agent to envy those who were given the FR option. Such disutility due to the presence of the (choosing) reference group would diminish the utility of the Difficult task under IDR and push the switching cutoff to a higher skill level. Note that, because we picked the parameters to make the expected return to the Easy task the same under IDR and FR, an agent who chooses the Easy task will have no reason to be envious. Thus, an agent who is prone to envying the opportunities made available to others will be less likely to choose the Difficult task in Treatment NCR than in Treatments NC or C. Given that we find the opposite result, our findings do not support the predictions of behavior given procedural fairness concerns.

Preferences for Flexibility:

Preferring to choose from a larger rather than a smaller menu should affect only agents who would both choose to perform the Difficult task and choose FR when available. Such agents could be upset about having a smaller menu in Treatment NCR. Because we set the parameters so that an agent performing the Easy task would have the same expected payoff under IDR and FR, subjects choosing the Easy task should not be upset about being denied the FR option. The effect of a preference for flexibility thus should be to shift the expected utility of the Difficult task under IDR downwards, leading to a prediction of a higher threshold for the Difficult task in NCR. This is the opposite of what we observe in the data. Moreover, a model with preferences for flexibility cannot explain the difference in the percentage of subjects choosing the Difficult task between Treatments C and NC, since neither setting has any reference that would cause subjects to perceive their flexibility as being restricted.

Probability Weighting:

The participants in our experiments were informed about their objective success rates before making their task choices. One could argue, however, that subjects might still overweight or un-

derweight their probability of failure or success. A subject may underweight the probability of success and not attempt the Difficult task, but such weighting, if present, likely would have equal effects in both Treatment C and Treatment NC. Hence, agents systematically underweighting their probability of success cannot explain the observed differences between these two treatments. It is possible that the non-choosing subjects in Treatment NCR could have received a confidence boost about their likelihood of success and, as a result, chosen the Difficult task more often in this treatment, but the fact they were told their assignment to the non-choosing group had been random leads us to discount this possibility.

Preference for Simplicity:

The decision problem in Treatment C requires subjects to choose between four possible combinations of task and loan repayment plans. In contrast, Treatment NC requires only that the subject choose a task. Subjects who do not have to choose a repayment plan may find it easier to evaluate the outcome of their task choice and thus make better decisions.[28] Although it seems plausible that subjects might make more mistakes in the relatively more complex Treatment C environment, it is not clear which way the mistakes would go. In Treatment C, a subject with a relatively high success rate may mistakenly choose the Easy task, or a subject with a relatively low success rate may mistakenly choose the Difficult task. Hence, complexity by itself does not predict whether there will be more or fewer subjects choosing the Difficult task in Treatment C as compared to the other treatments.[29]

Complexity-averse subjects in Treatment NCR may appreciate that their decision problem was simplified. Gratitude for facing a simpler task could produce an upward shift in the utility of choosing IDR for both the Easy and Difficult tasks. As long as the shift in the utility of choosing the Easy task does not exceed the shift in the utility of the Difficult task, consistent with what we found in the data, we would expect to see more subjects choosing the Difficult task in Treatment NCR than Treatment NC. Thus, aversion to complexity combined with gratitude from knowing a

[28] Having to make multiple decisions imposes a significant cognitive load. One strategy suggested for improving decision quality in a multiple-decision situation is to decompose the tasks (e.g., Raiffa, 1968; Armstrong et al., 1975). In a recent study, Ramachandran et al. (2018) show that task separation may not always improve decision quality.

[29] In Treatment C, the most common "mistake" occurred when subjects with relatively high skill levels chose the Easy task. This might be subjects' way of avoiding the plan choice problem in Treatment C, since choosing the Easy task makes the choice of repayment plan irrelevant.

more complex choice was avoided could explain this feature of our findings.

Regret:

An agent who commits to a certain loan repayment plan and task choice may compare her realized outcome with the outcomes that her alternative options would have delivered. In the event of a discrepancy between her ex-post payoff and the best payoff associated with a forgone alternative in the realized state, an agent may suffer from the negative emotion of regret.[30] If the agent is given more options from which to choose, there is more opportunity for her to feel regret over her decisions.

In the environment we have described, there are two potential sources of regret – regret over the repayment plan choice and regret over the task choice. Even holding the characteristics of an agent's chosen plan constant, having more plans in the market may reduce the agent's expected utility by increasing the likelihood she will regret her choice of plan. Simplifying the agent's decision problem by eliminating some choices could actually raise utility by shutting down potential sources of regret.

When an agent attempts the Easy task, unless her probability of success in the Difficult task is 100%, she does not know for sure what would have happened had she chosen the Difficult task.[31] Hence, she should not feel regret about not having chosen the Difficult task. If she attempts the Difficult task, however, she is able to compare the realized outcome with all of her possible foregone options because she knows what would have happened for sure if she had chosen the Easy task.

In Treatments NC and NCR, an agent who chooses the Difficult task may regret her choice of task, but she cannot regret her choice of repayment plan, as she has only one plan available to her. Hence, regret alone cannot predict any difference in behavior between Treatments NC and NCR. Under Treatment C, there are two potential sources of regret – regret about task choice and regret about plan choice. An agent who chooses the Difficult task and ends up with high earnings will make larger loan payments (and take home less income) under IDR than under FR. Therefore, when

[30] A related possibility is that borrowers rejoice when they realize ex-post that they made the right choice. Theoretically, the effects of anticipated rejoicing due to having made the right choice will be the opposite of the effects of anticipated regret due to having made the wrong choice (e.g., Loomes and Sugden, 1982). Our discussion on regret thus can be viewed as capturing the net effect of the negative emotion of regret and the positive emotion of rejoicing.

[31] In our subject pool, only 1 out of 272 subjects was 100% successful at the Difficult task.

the agent chooses IDR, in addition to the potential regret associated with the task choice (which is present in NC and NCR as well), there is also the potential for regret due to not having chosen the FR plan. Therefore, a regretful agent's expected utility from choosing the Difficult task under IDR in Treatment C is lower than in Treatments NC and NCR. That means regret theory would predict the lowest percentage of subjects choosing the Difficult task in Treatment C, which is consistent with our data. We provide a theoretical model of regret in Appendix B.2 and formally state the predictions of regret in our treatments. Regret by itself cannot explain the difference between NC and NCR, however, as the same sources of regret are present in both of those treatments.

Gratitude:

Recall that we found the highest percentage of subjects choosing the Difficult task in Treatment NCR. This suggests that, in our particular contract/task choice problem, when it was made salient to subjects that some plans were not available for them to choose, they appreciated being in the non-choosing group. Their appreciation could stem from realizing they had been given a simpler choice problem than the choosing group (as we argued above in our consideration of preferences for simplicity), or from realizing a potential source of regret had been shut down by the elimination of the FR plan. In Appendix B.3, we provide a theoretical model of gratitude that predicts a larger share of subjects should choose the Difficult task in Treatment NCR than in the other two settings.

Among all the aforementioned behavioral biases, our data can be best explained by the presence of regret and/or preferences for simplicity together with the presence of gratitude. The first two motives are consistent with a higher percentage of subjects choosing the Difficult task in Treatment NC than in Treatment C; the third motive predicts that a higher percentage of subjects will choose the Difficult task in Treatment NCR than in Treatment NC.

6 Conclusion

We study how varying the menu of contracts presented to an agent as well as the (potentially more limited) menu of contracts in her choice set affects her preferences for more remunerative but riskier tasks relative to lower paying but less risky alternatives. To make our analyses more concrete, we explore these issues in a context motivated by questions around how the loan repayment

options available to U.S. student borrowers may affect their post-college career decisions. However, our general framework is applicable to other settings. The experiments described in the body of the paper generated behavior that is inconsistent with the predictions of standard economic models in which each alternative in a choice set is evaluated independently. We discuss alternative behavioral biases that may play a role in this type of decision problem and consider whether and how these biases might explain the patterns observed in our data that cannot be explained by the standard model. The behavioral models of preference for simplicity and regret together with gratitude are most consistent with our empirical findings.

Our findings imply that the set of available contracts in a market should be considered not only from an expected return perspective but also from a behavioral perspective. While it is difficult to measure the welfare consequences of alternative contract designs, the clear behavioral biases we have identified in the lab shed light on the expected changes in welfare associated with different menus. Other contractual contexts could be analyzed in a similar fashion. The business decisions of an entrepreneur launching a new venture, for example, could be influenced by the menu of financing options to which she has access as well as the menu of those she knows about but cannot access.

While we focus on the elimination of the FR plan, as that was the most relevant in the context of thinking about student loan repayment, one also could study how the elimination of IDR – making FR the only available plan – would change borrowers' behavior. Note that similar behavioral concerns (such as preference for simplicity, regret and gratitude) may play a role in that alternative context as well. We leave this as a topic for future exploration.

The idea that having choices may trigger negative reference dependent utility terms is well established in the literature. We add to the existing literature by providing evidence that, in the presence of potential negative emotions generated by facing a menu with a larger number of choices, removing options from a decision maker's choice set can produce positive reference dependent utility terms, reflecting gratitude over not having to make a choice that could lead to negative emotions. This implies that, in thinking about the decision making process from a behavioral perspective, it may be important to consider both the choices that are available to an agent and the choices that, under some other circumstances, might have been available to her.

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A Appendix: Description of Current U.S. Loan Repayment Options

In the United States, student borrowers typically decide how they will repay their loans when they leave school or drop below half-time status (6 credits per semester). Borrowers have a six-month grace period before they must begin repaying their loans. Current U.S. student borrowers have access to a number of different repayment options, but those who do not make an active choice are defaulted into the standard 10-year repayment plan.[1] Similar to paying a mortgage on a house, this plan requires borrowers to make fixed monthly payments over a 10-year period after which their loan will be repaid with interest. Interest rates are fixed at loan origination so there is no uncertainty over this parameter at the time a borrower is entering repayment.

In 1993, the Department of Education (ED) introduced the first federal income driven repayment (IDR) plan. Current student borrowers have access to four available IDR options: Revised Pay As You Earn (REPAYE), Pay As You Earn (PAYE), Income-Based Repayment (IBR), and Income-Contingent Repayment (ICR). All current federal student borrowers are eligible to participate in REPAYE and ICR. Borrowers must meet certain requirements to participate in PAYE and IBR. Specifically, those who would pay less under PAYE than under the standard plan, first borrowed after September 2007, and took at least one loan disbursement after September 2011 are eligible to participate in PAYE. Borrowers who would pay less under IBR than under the standard plan are eligible to participate in IBR, though the terms vary depending on when the student's borrowing occurred.

The version of IDR in our experiment shares some features with so-called "fixed-length" IDR (also sometimes referred to as an "income-share agreement" or "human capital contract"), in that borrowers are required to make payments (as a share of income) for a set length of time, regardless of the amount repaid in the initial period. Although there are no wide-scale examples of fixed-length IDR currently in existence, there has been substantial interest in such plans both within state governments and at the federal level.[2] Several universities recently have started to offer fixed-length IDR contracts as an alternative to federal student loans. These include Purdue University ("Back-a-Boiler" program), Lackawanna College, and Clarkson University.[3]

Under the IDR plans currently available to federal borrowers, monthly payments are set equal to a specified percentage of the borrower's disposable income. REPAYE and PAYE set payments to 10 percent of discretionary income. IBR sets payments to 10 percent of discretionary income for those who first borrowed on or after July 2014, and to 15 percent for those who first borrowed earlier. ICR sets payments to the lesser of 20 percent of discretionary income and what the borrower "would pay on a repayment plan with fixed payment over the course of 12 years, adjusted according to

[1] See https://studentaid.gov/manage-loans/repayment/plans for details on available federal loan repayment options.

[2] https://www.nytimes.com/2016/04/09/business/dealbook/getting-a-student-loan-with-collateral-from-a-future-job.html

[3] https://www.insidehighered.com/quicktakes/2017/12/15/more-colleges-try-income-share-agreements

your income."[4] In PAYE and IBR, payments are capped at or below the amount the student would have paid had she initially selected the standard 10-year repayment plan. REPAYE and ICR plans do not cap loan payments.

Borrowers with earnings below a specified threshold are not required to make payments, but if payments under IDR are not sufficient to cover the monthly interest on a borrower's loan, outstanding debt will grow due to the unpaid interest.[5] Any remaining balance is forgiven after a set number of years.[6] Borrowers participating in PAYE are eligible for forgiveness after 20 years of payments. Borrowers who have only undergraduate debt and either are participating in REPAYE or are participating in IBR and first took out loans on or after July 2014 also are eligible for forgiveness after 20 years of payments. The remaining set of borrowers (ICR, REPAYE with graduate loans, and IBR who first borrowed before July 2014) are eligible for forgiveness after 25 years of payments. Borrowers working for public or nonprofit employers have access to the Public Service Loan Forgiveness Program, under which outstanding debt is forgiven after 10 years of active repayment.

Borrowers participating in an IDR plan must "recertify" their income and family size each year, although if their circumstances change before a year has passed (e.g., due to job loss or the birth of a child), the borrower can provide this information earlier and have their payments reduced. Failure to recertify will pause IDR participation and a borrower's future payments will depend on the version of IDR initially chosen.

Borrowers in REPAYE who don't recertify will be placed in an alternative repayment plan in which their required monthly payment is set equal to the amount necessary to repay the loan in full by the earlier of (a) 10 years from the date the borrower began repayment under the alternative repayment plan, or (b) the ending date of the 20- or 25-year IDR repayment period. Borrowers in PAYE, IBR, and ICR who fail to recertify will have their monthly payment amount set equal to the amount paid under a 10-year standard repayment plan based on the loan amount owed when the borrower initially entered IDR. For borrowers who initially participate in IDR, failing to recertify or actively switching to a different repayment plan will result in the borrower's unpaid interest being capitalized into their principal balance.

[4] See https://studentaid.gov/manage-loans/repayment/plans/income-driven for details.

[5] For borrowers in PAYE and IBR, ED covers unpaid interest on subsidized loans for up to three years after a student enters repayment. Under REPAYE, ED covers unpaid interest on subsidized loans and 50 percent of unpaid interest on unsubsidized loans during the same three-year period. Additionally, ED covers 50 percent of unpaid interest that accrues to subsidized loans held by borrowers participating in REPAYE for the duration of the required repayment period.

[6] Months in which a borrower is required to pay $0 are counted towards the required months of repayment.

B Appendix: Theories

B.1 Proof of Proposition 1 in Standard Theory

Proof. For any $p \in [0,1]$, the expected payoff difference between the Difficult and Easy tasks under FR is given by

$$\pi_{D,FR}(p) - \pi_{E,FR} = p^2 H + p(H-k) - (2L-k)$$

which is strictly increasing in p, negative at $p=0$ and positive at $p=1$. Hence, there must be a single cutoff, p^{FR}, determining a borrower's unique switching point where $\pi_{D,FR}(p^{FR}) = \pi_{E,FR}$.

Since we assume $L > k$, the following implications hold

$$L(L-H) < k(L-H) \Rightarrow L^2 + LH - Lk < 2LH - Hk \Rightarrow \frac{L^2}{H} + L - \frac{Lk}{H} < 2L - k$$

$$\Rightarrow \pi_{D,FR}(p^*) = (p^*)^2 H + p^*(H-k) < 2L - k = \pi_{E,FR}$$

since $p^* = \frac{L}{H}$. Then $\pi_{D,FR}(p^*) - \pi_{E,FR} < 0$. Since the expected payoff difference is increasing in p, this implies that $p^{FR} > p^*$. □

B.2 Regret

In the event of a discrepancy between an agent's ex-post payoff and the best payoff associated with a forgone alternative in the realized state, she may suffer from the negative emotion of regret.[1] If the agent is given more options from which to choose, there is more opportunity for her to feel regret over her decisions.

In the environment we have described, there are two potential sources of regret – regret over choice of repayment plan and regret over choice of task. We hypothesize that, even holding the characteristics of an agent's chosen plan constant, having more plans in the market may reduce the agent's expected utility by increasing the likelihood she will regret her choice of plan. Simplifying the agent's decision problem by eliminating some choices could actually raise utility by shutting down potential sources of regret.

Formally, the regret function, $R(.) : \mathbb{R} \to \mathbb{R}_+$, which depends on the payoff difference between the best foregone alternative and the chosen alternative, is assumed to be non-decreasing with $R(x) = 0$ for all $x \leq 0$. When an agent attempts the Easy task, she does not know for sure what would have happened had she chosen the Difficult task unless her probability of success in the Difficult task is 1.[2] If she attempts the Difficult task, however, she is able to compare the realized outcome with all of her possible foregone options.

[1] A related possibility is that borrowers rejoice when they realize ex post that they made the right choice. Theoretically, the effects of anticipated rejoicing due to having made the right choice will be the opposite of the effects of anticipated regret due to having made the wrong choice (see, e.g., Loomes and Sugden (1982)). Our analysis thus can be viewed as capturing the net effect of the negative emotion of regret and the positive emotion of rejoicing.

[2] In our subject pool, only 1 out of 272 subjects was 100% successful in the Difficult task.

Under NC, when an agent is forced into IDR, the agent who chooses the Difficult task may regret her choice of task, but she cannot regret her choice of repayment plan, as she is aware of only one plan . The regretful state occurs when she fails on the Difficult task in both periods and receives \$0 rather than choosing the Easy task and receiving \$4.8. Thus, under NC, the regretful utility of attempting the Difficult task becomes:

$$U^{NC}_{D,IDR}(p) = \pi_{D,IDR}(p) - (1-p)^2 R(4.8-0)$$

Note that the regret channels in NC and NCR cases are identical, because an agent's available options are the same in these two treatments and she is assumed to regret only due to alternatives that she could have chosen but did not.

Under C, there are two potential sources of regret – regret about task choice and regret about plan choice. An agent who chooses the Difficult task and succeeds in both periods will take home less income) under IDR (\$12) than under FR (\$16.8). If she performs the Difficult task only in the first period, then again her net payoff will be less under IDR (\$6) than under FR (\$6.8). If she fails on the Difficult task in both periods, then her net payoff will be zero, which is less than the payoff to performing the Easy task (\$4.8). Thus under C, the regretful utility of attempting the Difficult task under IDR becomes:

$$U^{C}_{D,IDR}(p) = \pi_{D,IDR}(p) - p^2 R(16.8-12) - p(1-p)R(6.8-6) - (1-p)^2 R(4.8-0)$$

Proposition 2. *Let p^C, p^{NC}, and p^{NCR} be the threshold probabilities of success in the Difficult task that makes a risk neutral agent indifferent between the Difficult and the Easy task for C, NC, and NCR, respectively. And let p^* be the socially efficient cutoff. Then*

$$p^C > p^{NC} = p^{NCR} > p^* \ \text{ if } \ R(x) > 0 \ \ \text{for all } x > 0$$

Proof. Since the utility of the Difficult task under IDR is the same in the NC and NCR settings for a regret motivated borrower, the switching cutoff from the Easy to Difficult task must be the same in these two treatments, i.e. $p^{NC} = p^{NCR}$.

Next we show that $p^{NC} = p^{NCR} > p^*$. First, $U^{NC}_{D,IDR}(p) = 12p - (1-p)^2 R(4.8)$ is strictly increasing in p because $\frac{\partial U^{NC}_{D,IDR}(p)}{\partial p} = 12 - 2(1-p)R(4.8) > 0$. Note also that $U^{NC}_{D,IDR}(0) < 0$ and $U^{NC}_{D,IDR}(1) > 0$. Hence there is a single cutoff for p^{NC} and that is the intersection of $U^{NC}_{D,IDR}(p^{NC}) = U^{NC}_{E,IDR}$.

Next plug the efficient p^* level into $U^{NC}_{D,IDR}$. Then we get

$$U^{NC}_{D,IDR}(p^*) = 12 \times \frac{4}{10} - (1 - \frac{4}{10})^2 R(4.8) < 4.8 = U^{NC}_{E,IDR}$$

That means at p^* the Difficult task is worse than the Easy task in the NC setting. Hence, $p^{NC} > p^*$.

Next we show that $p^C > p^{NC}$. First we will observe in the following arguments that in Treatment C, the switching cutoff is determined by the borrower who is indifferent between choosing the Easy task and choosing the Difficult task under IDR.

$$U^C_{D,IDR}(p) = 12p - p^2R(4.8) - p(1-p)R(0.8) - (1-p)^2R(4.8)$$

$$U^C_{D,FR}(p) = p^2 16.8 + p(1-p)6.8 - (1-p)pR(6) - (1-p)^2R(4.8)$$

It is immediate to see that $\frac{\partial^2 U^C_{D,IDR}}{\partial p^2} < 0$ and $\frac{\partial^2 U^C_{D,FR}}{\partial p^2} > 0$. Hence, $U^C_{D,IDR}$ is concave and $U^C_{D,FR}$ is convex. Since they are both equal to zero at $p = 0$, the cutoff for indifference between the Easy and Difficult tasks should be determined by the concave one, i.e. $U^C_{D,IDR}$. So the switching cutoff for treatment C solves $U^C_{D,IDR}(p^C) = U^C_{E,IDR}$

For any $p \in (0,1)$, $U^C_{D,IDR}(p) < U^{NC}_{D,IDR}$. Then at $p = p^C$

$$U^C_{D,IDR}(p^C) = U^C_{E,IDR} < U^{NC}_{D,IDR}(p^C)$$

This implies that $p^{NCR} < p^C$

That completes the proof of $p^C > p^{NCR} = p^{NC} > p^*$.

□

B.3 Gratitude

For this behavioral concern, we argue that borrowers may not enjoy the larger set of options in C due to a preference for simplicity (or maybe due to disutility of regret) and may be appreciative when they notice that their choice set is simplified (as in NCR). Who would feel gratitude for not being able to choose FR? For example, someone who chooses the Difficult task, and fails in the first round and succeeds in the second one, may appreciate that she did not have an FR plan as she would default in that case (and receive \$0) while currently she makes \$6. The behavioral utility below could capture this concern with a gratitude function $G : \mathbb{R} \to \mathbb{R}_+$ and $G(x) = 0$ for all $x \leq 0$

$$U^{NCR}_{D,IDR}(p) = \pi_{D,IDR}(p) + (1-p)pG(6-0)$$

Proposition 3. *Let p^C, p^{NC}, and p^{NCR} be the threshold probabilities of success in the Difficult task that make a risk neutral agent indifferent between the Difficult and the Easy task for C, NC, and NCR, respectively. Then*

$$p^C = p^{NC} > p^{NCR} \text{ if } G(x) > 0 \text{ for all } x > 0$$

.

Proof. For a borrower who feels gratitude as in the above formulation in NCR, note that her utility

of the Difficult task under IDR is larger in NCR than in NC as gratitude is a positive term in the utility. Hence,

$$\forall p \in (0,1), U^{NC}_{D,IDR}(p) < U^{NCR}_{D,IDR}(p)$$

In particular at p^{NC} which is the switching cutoff for NC,

$$U^{NC}_{D,IDR}(p^{NC}) = 4.8 < U^{NCR}_{D,IDR}(p^{NC})$$

Hence, $p^{NCR} < p^{NC}$.

Note also that gratitude does not affect the utilities in either C or NC, hence, the switching cutoffs in those two treatments must be the same, i.e. $p^C = p^{NC}$.

Overall this completes the proof of $p^C = p^{NC} > p^{NCR}$ under the gratitude formulation. □

Note that the predictions of the Regret and Gratitude models above jointly imply $p^C > p^{NC} > p^{NCR}$ which is what we found in the experiments.

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C Appendix: Additional Data Analysis

The characteristics of our experimental subject pool align closely with those of the University of Maryland (UMD) undergraduate student body as a whole. For these comparisons, we use Fall 2015 administrative data on Maryland undergraduates. Some 46.3% of our experiment participants were female, compared to 46.1% percent of Maryland undergraduates. Their average ages also were similar (20.7 years for the experiment participants and 20.4 years for the Maryland undergraduates). Among our experiment participants, 42.3% reported that they held student loans, while 43.3% percent of Maryland undergraduates had obtained loans while enrolled at UMD. Of those with a positive loan balance, the amount outstanding was $19,150 among the experiment participants compared to $18,020 for all Maryland undergraduates.

The experiment participants answered two financial literacy questions that also were asked of 4,399 UMD students in a survey administered in 2016 and reported in Abraham et al. (2020). Among the experiment participants, 45% answered at least one of those questions correctly, compared to 47% of the survey participants. The average Maryland undergraduate for whom an SAT score was reported to the university scored at the 81.8th percentile. Because we do not know when the experiment participants who reported their scores to us took the test, we cannot be certain about their score percentiles. We use the 2011 score distribution made available by the College Board to convert the scores reported by the experiment participants to a percentile measure and estimate that the average experiment subject scored at the 82.3rd percentile.

Table C.1. Average Success Rate by Task and Treatment

	Treatment C	Treatment NC	Treatment NCR	All
Success Rate in Easy Task	0.998 (0.016)	0.998 (0.010)	0.997 (0.014)	0.998 (0.014)
Success Rate in Difficult Task	0.588 (0.187)	0.578 (0.175)	0.595 (0.205)	0.587 (0.189)
Observations (full sample)	91	90	91	272
Success Rate in Difficult Task (restricted sample)	0.588 (0.188)	0.578 (0.176)	0.603 (0.195)	0.590 (0.186)
Observations (restricted sample)	89	87	82	258

Notes: Standard deviations are in parentheses. The restricted sample excludes the 8 subjects with less than 100% success on the Easy task and the 6 choosing subjects in Treatment NCR.

Table C.2. Percentage of Subjects Choosing Difficult Task, by Treatment and Success Rate

Success Rate in Difficult Task	Treatment C	Treatment NC	Treatment NCR
$p \leq 0.33$	0%	0%	0%
$0.33 < p < 0.66$	42.9%	58.5%	81.4%
$p \geq 0.66$	93.9%	100%	100%
All	61.4%	68.2%	81.6%

Notes: The sample excludes the 8 subjects with less than 100% success on the Easy task and the 6 choosing subjects in Treatment NCR. See Section 3 for descriptions of the three treatments. p represents the probability of success at the Difficult task.

Reference

Abraham, K. G., E. Filiz-Ozbay, E. Y. Ozbay, and L. J. Turner (2020): "Framing Effects, Earnings Expectations, and the Design of Student Loan Repayment Schemes," *Journal of Public Economics*, 183.

D APPENDIX: Experiment Instructions and Additional Information Collection

Welcome to the experiment. The precise rules and procedures that govern the operation of this experiment will be explained to you below. The instructions are simple, and if you follow them carefully and pay attention to your decisions, you may increase the amount you earn. You will receive a $7 participation fee for completing the experiment and an additional amount that will depend on the decisions you make during the experiment. Note that only your own decisions will affect your final earnings. The experiment will last about 1 hour 30 minutes. **Please do not talk to each other** during the session. If you have any question, please raise your hand and the experimenter will come to your station. The experiment consists of three parts. After completion of each part, you will receive instructions for the next.

Instructions for Part 1

In this part of the experiment, you will be asked to perform two types of tasks.

Type A Tasks: Each task of this type requires you to type a five letter word appearing on your screen. You will have 20 seconds to complete each task. You will perform 30 Type A tasks. Each correctly completed Type A task pays $0.10. At the end of this part of the experiment a report screen will tell you how many Type A tasks you completed correctly.

Once you complete the Type A tasks, you will begin the Type B tasks.

Type B Tasks: Each task of this type requires you to reason out and provide the answer to a question. You will have 1 minute to answer each question. You will perform 30 Type B tasks. Each correctly completed Type B task pays $0.10. At the end of this part of the experiment, a report screen will tell you how many Type B tasks you completed correctly.

You should try to complete the tasks you are given as accurately as you can. Having more correctly completed tasks not only will increase your earnings in this part of the experiment but also will have a positive and significant impact on your earnings in the next part of the experiment.

Instructions for Part 2 *[for Treatment C]*

In order to participate in Part 2 of the experiment, you must borrow $2 from the experimenter. To pay this loan back, you will need to earn money in the following two rounds. Your earnings in this part of the experiment will be determined by your performance on the tasks in Part 1 of the experiment and the loan repayment plan you choose.

Available Loan Repayment Plans:

There are two loan repayment plans that you can choose from.

Plan 1: Under this plan, you are required to pay back $3.20 in the first round. All of your remaining earnings from the first round as well as your total earnings from the second round will be yours to keep. However, if you do not earn money in the first round, you will not be able to make your loan repayment. You will be considered to have defaulted on the loan and will not be permitted to continue in the second round of this part of the experiment.

Plan 2: Under this plan, you need to pay back 40% of your earnings in each round. Even if you do not earn any money in the first round, you will continue to the second round.

Earning Money to Repay Your Loan

In order to earn money, you need to decide whether you want your earnings to be determined by your performance on the Type A tasks or the Type B tasks that you performed in Part 1 of the experiment. You will not perform these tasks again. You will just choose the type of task you want to be used to determine your earnings in this part of the experiment.

Once you choose whether you want to use the Type A tasks or the Type B tasks, one of the tasks of that type that you performed in Part 1 will be randomly selected. Each task of the chosen type has an equal chance of being selected. If you performed the selected task correctly, you will earn money for the first round. If you did not perform the selected task correctly, you will earn nothing for the first round. If you continue in the second round, one of the tasks of the chosen type that you completed in Part 1 will again be randomly selected. As in the first round, each task of the given type will have an equal chance of being selected for the second round. The same task may be selected in both rounds.

In each round, you will earn **$4** for selected Type A task that was correctly completed and **$10** for a selected Type B task that was correctly completed.

For example, suppose that you choose to use Type B tasks for determining your earnings. In this case, the computer will pick randomly one of the Type B tasks that you performed earlier. Let's say the computer picks task #28 from the Type B tasks that you performed. If you completed that task correctly in Part 1, you will earn $10 in round 1; otherwise, you will earn $0 in round 1. Then you will move to round 2 and the computer again will pick a task randomly from the 30 Type B tasks that you performed earlier. Say the computer picks task #13 this time. If you completed that task correctly in Part 1, you will earn $10 in round 2; otherwise, you will earn $0 in round 2.

Recall that you typed 30 five-letter-words to complete the Type A tasks and answered 30 cognitive questions to complete the Type B tasks. As an aid to making your decision about which type of task to choose, your screen will show you how many of each type of task you completed correctly in Part 1. For example, a subject who completed 21 out of 30 Type A tasks correctly and 12 out of 30 Type B tasks correctly will see the following on his/her screen:

	Number of Correct Responses	Number of Questions	Probability of Correct Response
Type A	21	30	70%
Type B	12	30	40%

Knowing your performance in Part 1, here's what happens next:

- You will choose a loan repayment plan (Plan 1 or Plan 2).
- You will choose to base your earnings in Part 2 either on the Type A tasks or the Type B tasks you completed in Part 1.
- For each of the two rounds of this second part of the experiment, assuming you are participating in that round, the computer will select a task randomly from among the tasks of the type you chose.
- Your net payout will be calculated as the total earnings across the two rounds (based on whether the randomly selected task(s) of the type you chose were completed correctly) **minus** the total loan repayment (based on your plan).

Note that your overall earnings and loan repayment will depend on the task you choose, your performance on that task in Part 1, and the repayment plan you have selected.

Example 1: If you choose Task A and Plan 1 and you completed the tasks selected in both round 1 and round 2 correctly, your net payout will be calculated as follows:

	Earnings	**Loan Repayment**	**Net Payout**
Round 1	$4	$3.20	$0.80
Round 2	$4	0	$4
Total	**$8**	**$3.20**	**$4.80**

Example 2: If you choose Task A and Plan 1 and you did not complete the task selected in round 1 correctly, you will earn $0 and default on your loan. Hence you will not be permitted to continue in the second round. This means you will receive a $0 net payout:

	Earnings	**Loan Repayment**	**Net Payout**
Round 1	$0	$0	$0
Round 2	--	--	--
Total	**$0**	**$0**	**$0**

Example 3: If you choose Task A and Plan 2 and you did not complete the task selected in round 1 correctly but did complete the task selected for round 2 correctly, your net payout will be calculated as follows:

	Earnings	**Loan Repayment**	**Net Payout**
Round 1	$0	$0	$0
Round 2	$4	$1.60	$2.40
Total	**$4**	**$1.60**	**$2.40**

Example 4: If you choose Task B and Plan 2 and your answer to the question selected in round 1 was correct but your answer to the question selected in round 2 was wrong, your net payout will be calculated as follows:

	Earnings	**Loan Repayment**	**Net Payout**
Round 1	$10	$4	$6
Round 2	$0	$0	$0
Total	**$10**	**$4**	**$6**

Example 5: If you choose Task B and Plan 2 and your answers to the selected questions in both round 1 and round 2 were correct, your net payout will be calculated as follows:

	Earnings	**Loan Repayment**	**Net Payout**
Round 1	$10	$4	$6
Round 2	$10	$4	$6
Total	**$20**	**$8**	**$12**

Quiz

1) Suppose a subject chooses Task B and Plan 1. Her answer to the randomly selected question from her Task B problems in round 1 was wrong, and in round 2 was correct. Hence she defaulted on her loan in the first round. Fill in the table below for this subject.

	Earnings	**Loan Repayment**	**Net Payout**
Round 1			
Round 2			
Total			

2) Suppose a subject chooses Task B and Plan 1. Her answers to the randomly selected question from her Task B problems in both round 1 and round 2 were correct. Fill in the table below for this subject,

	Earnings	**Loan Repayment**	**Net Payout**
Round 1			
Round 2			
Total			

3) Suppose a subject chooses Task A and Plan 2. Her randomly selected task selected from those she performed in Task A was incorrect in round 1 and correct in round 2. Fill in the table below for this subject.

	Earnings	**Loan Repayment**	**Net Profit**
Round 1			
Round 2			
Total			

Instructions for Part 2 ***[for Treatment NC]***

In order to participate in Part 2 of the experiment, you must borrow $2 from the experimenter. To pay this loan back, you will need to earn money in the following two rounds. Your earnings in this part of the experiment will be determined by your performance on the tasks in Part 1 of the experiment and your loan repayment plan.

The Loan Repayment Plan

The loan repayment plan requires you to pay back 40% of your earnings in each round. Even if you do not earn any money in the first round, you will continue to the second round.

Earning Money to Repay Your Loan

In order to earn money, you need to decide whether you want your earnings to be determined by your performance on the Type A tasks or the Type B tasks that you performed in Part 1 of the experiment. You will not perform these tasks again. You will just choose the type of task you want to be used to determine your earnings in this part of the experiment.

Once you choose whether you want to use the Type A tasks or the Type B tasks, one of the tasks of that type that you performed in Part 1 will be randomly selected. Each task of the chosen type has an equal chance of being selected. If you performed the selected task correctly, you will earn money for the first round. If you did not perform the selected task correctly, you will earn nothing for the first round. In the second round, one of the tasks of the chosen type that you completed in Part 1 will again be randomly selected. As in the first round, each task of the given type will have an equal chance of being selected for the second round. The same task may be selected in both rounds.

In each round, you will earn **$4** for a selected Type A task that was correctly completed and **$10** for a selected Type B task that was correctly completed.

For example, suppose that you choose to use Type B tasks for determining your earnings. In this case, the computer will pick randomly one of the 30 Type B tasks that you performed earlier. Let's say the computer picks task #28 from the Type B tasks you performed. If you completed that task correctly in Part 1, you will earn $10 in round 1; otherwise, you will earn $0 in round 1. Then you will move to round 2 and the computer again will pick a task randomly from the 30 Type B tasks that you performed earlier.

Say the computer picks task #13 this time. If you completed that task correctly in Part 1, you will earn $10 in round 2; otherwise, you will earn $0 in round 2.

Recall that you typed 30 five-letter-words to complete the Type A tasks and answered 30 cognitive questions to complete the type B tasks. As an aid to making your decision about which type of task to choose, your screen will show you how many of each type of task you completed correctly in Part 1. For example, a subject who completed 21 out of 30 Type A tasks correctly and 12 out of 30 Type B tasks correctly will see the following on his/her screen:

	Number of Correct Responses	Number of Questions	Probability of Correct Response
Type A	21	30	70%
Type B	12	30	40%

Knowing your performance in Part 1, here's what happens next:

- You will choose to base your earnings in Part 2 either on the Type A tasks or the Type B tasks you completed in Part 1.
- For each of the two rounds of this second part of the experiment, the computer will select a task randomly from among the tasks of the type you chose.
- Your net payout will be calculated as the total earnings across the two rounds (based on whether the randomly selected tasks of the type you chose were completed correctly) **minus** 40% of your earnings deducted as a loan repayment.

Note that your overall earnings and loan repayment will depend on the task you choose and your performance on that task in Part 1.

Example 1: If you choose Task A and you completed the tasks selected in both round 1 and round 2 correctly, your net payout will be calculated as follows:

	Earnings	**Loan Repayment**	**Net Payout**
Round 1	$4	$1.60	$2.40
Round 2	$4	$1.60	$2.40
Total	**$8**	**$3.20**	**$4.80**

Example 2: If you choose Task A and you did not complete the task selected in round 1 correctly but did complete the task selected for round 2 correctly, your net payout will be calculated as follows:

	Earnings	**Loan Repayment**	**Net Payout**
Round 1	$0	$0	$0
Round 2	$4	$1.60	$2.40
Total	**$4**	**$1.60**	**$2.40**

Example 3: If you choose Task B and your answers to both of the selected questions were wrong, your net payout will be calculated as follows:

	Earnings	**Loan Repayment**	**Net Payout**
Round 1	$0	$0	$0
Round 2	$0	$0	$0
Total	**$0**	**$0**	**$0**

Example 4: If you choose Task B and your answer to the question selected in round 1 was correct but your answer to the question selected in the round 2 was wrong, your net payout will be calculated as follows:

	Earnings	**Loan Repayment**	**Net Payout**
Round 1	$10	$4	$6
Round 2	$0	$0	$0
Total	**$10**	**$4**	**$6**

Example 5: If you choose Task B and your answers to the selected questions in both round 1 and round 2 were correct, your net payout will be calculated as follows:

	Earnings	**Loan Repayment**	**Net Payout**
Round 1	$10	$4	$6
Round 2	$10	$4	$6
Total	**$20**	**$8**	**$12**

Quiz

4) Suppose a subject chooses Task B. Her answer to the randomly selected question from her Task B problems in round 1 was wrong, and in round 2 was correct. Fill in the table below for this subject.

	Earnings	**Loan Repayment**	**Net Payout**
Round 1			
Round 2			
Total			

5) Suppose a subject chooses Task A. Her randomly selected task selected from those she performed in Task A was correct in round 1 and incorrect in round 2. Fill in the table below for this subject.

	Earnings	**Loan Repayment**	**Net Payout**
Round 1			
Round 2			
Total			

Instructions for Part 2 ***[for Treatment NCR]***

In order to participate in Part 2 of the experiment, you must borrow $2 from the experimenter. To pay this loan back, you will need to earn money in the following two rounds. Your earnings in this part of the experiment will be determined by your performance on the tasks in Part 1 of the experiment and your loan repayment plan.

Loan Repayment Plans:

There are two relevant loan repayment plans.

Plan 1: Under this plan, you are required to pay back $3.20 in the first round. All of your remaining earnings from the first round as well as your total earnings from the second round will be yours to keep. However, if you do not earn money in the first round, you will not be able to make your loan repayment. You will be considered to have defaulted on the loan and will not be permitted to continue in the second round of this part of the experiment.

Plan 2: Under this plan, you need to pay back 40% of your earnings in each round. Even if you do not earn any money in the first round, you will continue to the second round.

Some of the subjects in the lab will be allowed to choose the loan repayment plan they wish to have. The other subjects will be assigned to Plan 2. The computer will randomly determine whether you are allowed to choose a plan or are assigned to Plan 2.

Earning Money to Repay Your Loan

In order to earn money, you need to decide whether you want your earnings to be determined by your performance on the Type A tasks or the Type B tasks that you performed in Part 1 of the experiment. You will not perform these tasks again. You will just choose the type of task you want to be used to determine your earnings in this part of the experiment.

Once you choose whether you want to use the Type A tasks or the Type B tasks, one of the tasks of that type that you performed in Part 1 will be randomly selected. Each task of the chosen type has an equal chance of being selected. If you performed the selected task correctly, you will earn money for the first round. If you did not perform the selected task correctly, you will earn nothing for the first round. If you continue in the second round, one of the tasks of the chosen type that you completed in Part 1 will again

be randomly selected. As in the first round, each task of the given type will have an equal chance of being selected for the second round. The same task may be selected in both rounds.

In each round, you will earn **$4** for a selected Type A task that was correctly completed and **$10** for a selected Type B task that was correctly completed.

For example, suppose that you choose to use Type B tasks for determining your earnings. In this case, the computer will pick randomly one of the Type B tasks that you performed earlier. Let's say the computer picks task #28 from the Type B tasks that you performed. If you completed that task correctly in Part 1, you will earn $10 in round 1; otherwise, you will earn $0 in round 1. Then you will move to round 2 and the computer again will pick a task randomly from the 30 Type B tasks that you performed earlier. Say the computer picks task #13 this time. If you completed that task correctly in Part 1, you will earn $10 in round 2; otherwise, you will earn $0 in round 2.

Recall that you typed 30 five-letter-words to complete the Type A tasks and answered 30 cognitive questions to complete the Type B tasks. As an aid to making your decision about which type of task to choose, your screen will show you how many of each type of task you completed correctly in Part 1. For example, a subject who completed 21 out of 30 Type A tasks correctly and 12 out of 30 Type B tasks correctly will see the following on his/her screen:

	Number of Correct Responses	Number of Questions	Probability of Correct Response
Type A	21	30	70%
Type B	12	30	40%

Knowing your performance in Part 1, here's what happens next:

- You will learn whether you are allowed to choose a loan repayment plan (Plan 1 or Plan 2) or have been assigned by the computer to Plan 2.
- If you are allowed to choose a loan repayment plan, the computer will ask you to select Plan 1 or Plan 2.
- If you are not allowed to choose a plan, the computer will assign you to Plan 2.
- You will choose to base your earnings in Part 2 either on the Type A tasks or the Type B tasks you completed in Part 1.

- For each of the two rounds of this second part of the experiment, assuming you are participating in that round, the computer will select a task randomly from among the tasks of the type you chose.
- Your net payout will be calculated as the total earnings across the two rounds (based on whether the randomly selected task(s) of the type you chose were completed correctly) **minus** the total loan repayment (based on your plan).

Note that your overall earnings and loan repayment will depend on the task you choose, your performance on that task in Part 1, and the repayment plan you have chosen or been assigned to by the computer.

Example 1: If you choose Task A and Plan 1 and you completed the tasks selected in both round 1 and round 2 correctly, your net payout will be calculated as follows:

	Earnings	**Loan Repayment**	**Net Payout**
Round 1	$4	$3.20	$0.80
Round 2	$4	0	$4
Total	**$8**	**$3.20**	**$4.80**

Example 2: If you choose Task A and Plan 1 and you did not complete the task selected in round 1 correctly, you will earn $0 and default on your loan. Hence you will not be permitted to continue in the second round. This means you will receive a $0 net payout:

	Earnings	**Loan Repayment**	**Net Payout**
Round 1	$0	$0	$0
Round 2	--	--	--
Total	**$0**	**$0**	**$0**

Example 3: If you choose Task A; choose or are assigned to Plan 2; and did not complete the task selected in round 1 correctly but did complete the task selected for round 2 correctly, your net payout will be calculated as follows:

	Earnings	**Loan Repayment**	**Net Payout**
Round 1	$0	$0	$0
Round 2	$4	$1.60	$2.40
Total	**$4**	**$1.60**	**$2.40**

Example 4: If you choose Task B; choose or are assigned to Plan 2; and your answer to the question selected in round 1 was correct but your answer to the question selected in round 2 was wrong, your net payout will be calculated as follows:

	Earnings	**Loan Repayment**	**Net Payout**
Round 1	$10	$4	$6
Round 2	$0	$0	$0
Total	**$10**	**$4**	**$6**

Example 5: If you choose Task B; choose or are assigned to Plan 2; and your answers to the selected questions in both round 1 and round 2 were correct, your net payout will be calculated as follows:

	Earnings	**Loan Repayment**	**Net Payout**
Round 1	$10	$4	$6
Round 2	$10	$4	$6
Total	**$20**	**$8**	**$12**

Quiz

6) Suppose a subject chooses Task B and Plan 1. Her answer to the randomly selected question from her Task B problems in round 1 was wrong, and in round 2 was correct. Hence she defaulted on her loan in the first round. Fill in the table below for this subject.

	Earnings	**Loan Repayment**	**Net Payout**
Round 1			
Round 2			
Total			

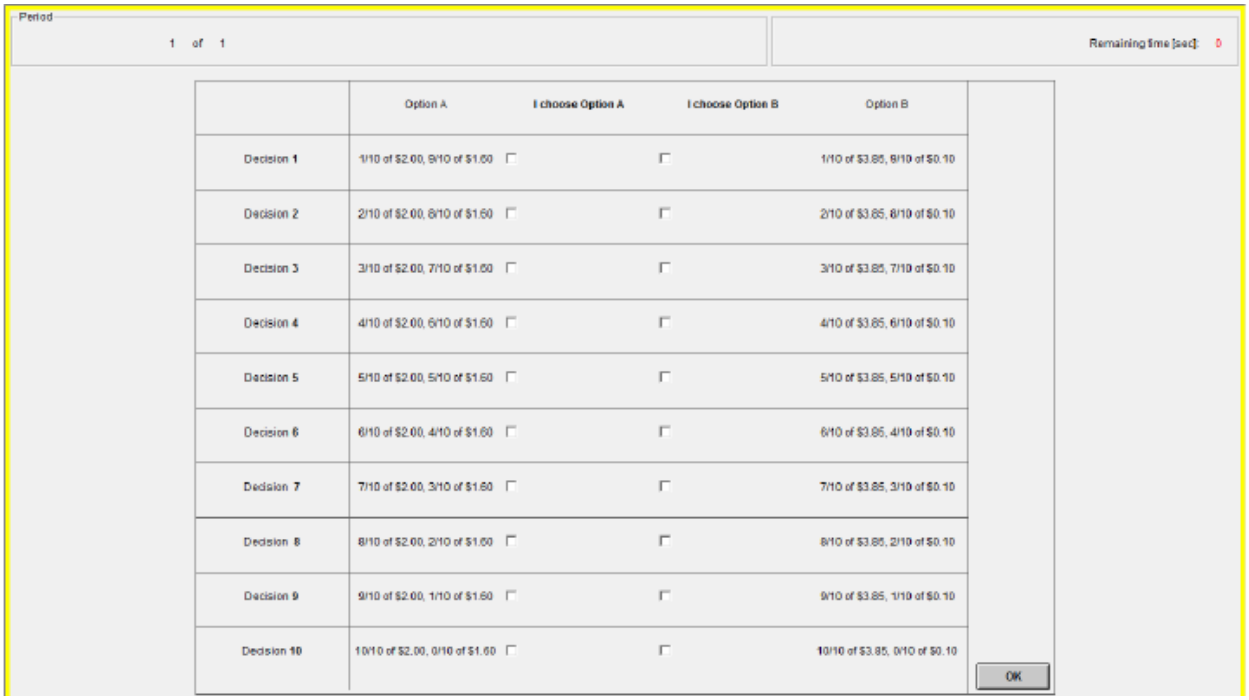
7) Suppose a subject chooses Task B and Plan 1. Her answers to the randomly selected question from her Task B problems in both round 1 and round 2 were correct. Fill in the table below for this subject,

	Earnings	**Loan Repayment**	**Net Payout**
Round 1			
Round 2			
Total			

8) Suppose a subject chooses Task A and is assigned to Plan 2. Her randomly selected task selected from those she performed in Task A was incorrect in round 1 and correct in round 2. Fill in the table below for this subject.

	Earnings	**Loan Repayment**	**Net Profit**
Round 1			
Round 2			
Total			

Measuring Risk Preference



Post-Experiment Questionnaire

1. Do you have any student loan debt in your name (e.g., federal direct or FFEL loans, federal Perkins loans, private loans)? Do not consider loans your parents may have taken out.
Yes
No

2. What is your current outstanding student loan balance, counting student loans from all sources? Only include student loans taken out in your name, not any taken out by your parents. Please answer in whole dollars.

3. Do you have any debt other than student loan debt?
Yes
No

4. What type(s) of other debt do you have?
Credit card debt (other than balances you pay off every month)
Auto loan
Mortgage on a home
Other

5. If you selected "Other" in the previous question, please specify:

6. Suppose you owe $1,000 on your credit card and the interest rate you are charged is 20% per year compounded annually. If you didn't pay anything off, at this interest rate, how many years would it take for the amount you owe to double?
Less than 2 years
2 to 4 years
5 to 10 years
11 or more years
Not sure

7. Suppose you owe $3,000 on your credit card. The Annual Percentage Rate (APR) on the balance owed is 12% (or 1% per month). You make a payment of $30 each month. How many years would it take to eliminate your credit card debt if you made no additional new charges?
Less than 5 years
5 to 10 years
11 to 15 years
More than 15 years
Never, you will continue to be in debt
Not sure

8. In general, how willing are you to take risks in financial matters? Please tick a box on the scale, where the value 0 means: "not at all willing to take risks" and the value 10 means: "very willing to take risks".

9. What is your gender?

10. In what year were you born?

11. What was your SAT score?

12. What was your ACT score?