Borrowing to Keep Up (with the Joneses)

Inequality, Debt, and Conspicuous Consumption

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Abstract

The quest for status is a powerful motivator, but does it affect inequality? This paper presents a novel lab experiment that was designed and conducted to identify the relationship between inequality, status signaling, debt, and conspicuous consumption. It reports three main findings: First, consumption increases when it is "conspicuous" (i.e. is both observable, and signals ability/status). Second, borrowing increases when consumption is conspicuous. More critically, this increase in loan-taking is driven by those at the bottom of the income distribution. Third, in the presence of conspicuous consumption, access to finance exacerbates inequality. The results point to a vicious cycle of inequality and costly borrowing.

Borrowing to keep up (with the Joneses):
Inequality, debt, and conspicuous consumption

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Under the regime of individual ownership the most available means of visibly achieving a purpose is that afforded by the acquisition and accumulation of goods; and as the self-regarding antithesis between man and man reaches fuller consciousness, the propensity for achievement—the instinct of workmanship—tends more and more to shape itself into a straining to excel others in pecuniary achievement. Relative success, tested by an invidious pecuniary comparison with other men, becomes the conventional end of action.

– Veblen, 1899 "The theory of the leisure class"

Men do not desire merely to be rich, but richer than other men.
– John Stuart Mill

I. Introduction

The quest for status has been argued to be a powerful motivator, affecting consumption patterns, borrowing, and even happiness. Discussions about the role of social status on one's happiness and consumption go back to Veblen (1899), or even earlier.[2] Veblen details the concept of "pecuniary emulation": those at lower levels of status in a society emulate the consumption behavior of those at higher levels of status, even when they may not have the means to engage in said consumption (Veblen, 1899; chapter 2), for the express purpose of signaling status. This forms the basis of "conspicuous consumption", the acquisition of goods and services to display status. Moreover, in the presence of inequality and access to credit, conspicuous consumption motives may distort personal financial decisions and create unintended macroeconomic instability. If these distortions disproportionately affect the poor, they could worsen inequality. However, causal evidence for the effects of conspicuous consumption and access to credit on financial decisions and inequality are not well established.

This paper uses a series of lab experiments to establish *causal* relationships between conspicuous consumption, access to credit and inequality. We report three main findings: first, consumption, even when costly and having zero value outside the experiment*,* increases when consumption is both observable and signals ability/status (which together is defined as "conspicuous"). Both conditions are necessary for consumption to rise, in line with results reported in Clingingsmith and Sheremeta (2018). Second, we document a result novel to the literature: conspicuous consumption causes an increase in loan-taking, and we show that this increase is driven by individuals at the lowest income levels. Third, and critically, in the presence of conspicuous consumption, access to loans exacerbates inequality.

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[2] Smith (1759), for example, wrote in the Theory of Moral Sentiments, about the pursuit of wealth being driven by one's need to avoid their financial distress being viewed by others (Luttmer, 2005).

The idea of conspicuous consumption, or "keeping-up-with-the-Joneses", has been extensively applied in a large body of theories.[3] Various empirical evidence also established social status as an important factor to subjective well-being (see Frank, 1999 and Clark et al, 2008 for reviews, and Luttmer, 2005).[4] In addition, "keeping-up-with-the-Joneses" motive has been argued to influence consumption and financial decisions in various contexts.[5] Most prominently, the 2007-2009 financial crisis is argued to be caused, at least partly, by over-borrowing and over-spending of American households with poor credit ratings in the run-up to the crisis (Mian and Sufi, 2011, 2015). In the same vein, Bertrand and Morse (2016) show that between 1980 and 2008, non-rich households consumed a larger share of their current income, especially on visible goods and services, when exposed to higher top income and consumption levels.

However, one difficulty with the empirical literature is that the connection between consumption and borrowing to the conspicuous consumption explanation is largely suggestive. It is difficult to disentangle conspicuous consumption motives from other factors, such as exposure to visible (and usually high-quality) goods; or preferences for visible goods.[6] For example, one can argue that rising visible consumption is not because of status-signalling, but because of exposure to, and learning about, the quality of visible goods introduced by higher status individuals. Indeed, there may be other considerations that are not immediately observable (such as longevity or enhanced customer support to the visible goods) that could well be driving the preferences and choices in the real world. Our paper contributes to the literature by documenting (for the first time) clear causal evidence that the conspicuous consumption motive results in increased wasteful loan-taking, and this is concentrated amongst lower income groups. The setting of the lab environment allows us to remove competing hypotheses (such as preferences) and claim causality for the relationship between conspicuous consumption and loan-taking.

Importantly, our paper contributes to the literature by showing that in the presence of conspicuous consumption and inequality, access to costly credit worsens inequality. The lab

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[3] See Leibenstein, 1950; Bagwell and Bernhaim, 1996; and Hopkins and Kornienko, 2004 for theories on consumer demand; Basu, 1987 on price rigidity; Glazer and Konrad, 1996 on charitable giving; Gali, 1994 on portfolio choice; Carroll et al, 1997 on growth; Ljungqvist and Uhlig, 2000 on tax policy.

[4] For example, Luttmer, 2005 finds that controlling for an individual's own income, higher earnings of neighbors are associated with lower levels of self-reported happiness. This result provides *suggestive* evidence that people care about their status relative to a comparison group

[5] See among others, Bloch, Rao, and Desai, 2004; Grinblatt, Keloharju, and Ikaheimo, 2008; Charles, Hurst, and Roussanov, 2009; Kuhn et al. 2011; Bursztyn et al, 2017; Bricker, Krimmel, and Ramcharan, 2020; Agarwal et al, 2020; De Giorgi, Frederiksen, and Pistaferri, 2020.

[6] The literature distinguishes between more "visible" goods, which are goods that are more visible to others (Heffetz, 2011) such as cars, clothing, or furniture, and less "visible" goods, such as car insurance and underwear. Naturally, this style of categorization entails that engaging in such visible consumption could be driven by both preferences and by visibility.

environment allows us to generate exogenous access to credit, a very difficult thing to argue for in the empirical literature on conspicuous consumption. Access to credit does not generally vary greatly within a country, and even if it does, this is usually associated with local conditions such as poverty and inequality, making it difficult to argue for the causal effects of access to credit on borrowing and inequality. This finding has a powerful implication, that inequality and access to costly credit in the presence of conspicuous consumption creates a vicious cycle, in which the combination of inequality and status-signaling encourages more costly loan-taking from the poorest groups, which in turn damages the financial conditions of these individuals and exacerbates inequality.

Our paper also contributes to the rich literature on access to finance by showing that access to credit in the presence of conspicuous consumption motives could cause adverse outcomes. The traditional view is that access to finance brings great benefits (see Beck and Demirgüç-Kunt, 2007; and Demirgüç-Kunt et al, 2008). While these benefits are not disputed, recent studies have shown some of its downsides. For example, Bianchi (2011) and Davila and Korinek (2018) examine over-borrowing driven by pecuniary externalities, in which one does not internalize that their borrowing could contribute to overall macroeconomic instability, hence individuals borrow more than the socially optimal amount. This new view highlights some drawbacks of access to finance, a point we find support for in this experiment.

Finally, by pointing to a mechanism via which inequality can cause harm and create a feedback loop, our paper also relates to debates about inequality, which is gathering steam in light of new evidence about rising inequality in the developed world (Piketty, 2014). Theoretical and empirical studies exploring the effects of income inequality upon growth tend to reach inconclusive results (see Aghion et al, 1999 for an early review; Marrero and Rodriguez, 2013 and Ferreira et al, 2018 for recent evidence). Our paper contributes to this literature by providing experimental evidence that inequality, in the presence of conspicuous consumption, encourages costly loan-taking by the poor, which in turn exacerbates inequality.

A number of papers use the lab to study status, particularly in order to disentangle preferences and motivations (Ball and Eckel, 1996, 1998; Ball et al. 2001; Charness, Masclet, and Villeval, 2014; Clingingsmith and Sheremeta, 2018). Our paper is closest to Clingingsmith and Sheremeta (2018)[7], who also use a lab experiment to show that increasing observability of consumption

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[7] Another closely related paper is that of Pettit and Sivanathan (2011), which documents a self-threat mechanism to engaging in credit for conspicuous consumption. The basic idea is that purchasing behavior contains the utility of obtaining the item as well as the disutility of paying for said item. Credit allows subjects to defer the disutility of

increases demand of goods, but only when they signal ability. Our first finding is very similar to theirs: both observability and ability-signals are necessary conditions for conspicuous consumption.[8] However, our paper differs to Clingingsmith and Sheremeta (2018) in several important ways. Most importantly, our main purpose is to establish a nexus between inequality, access to loans and conspicuous consumption. By implementing access to costly loans, we demonstrate that loan-taking increases with conspicuous consumption, and that this is mostly driven by the low-income subjects seeking pecuniary emulation. We also document a vicious cycle between inequality and costly loan-taking.

The rest of the paper proceeds as follows: the next section discusses the experimental design, followed by the results and then the conclusion.

II.   Experimental design

The experiment consists of a total of eight treatments, varying (i) observability of purchasing, (ii) ability signaling, and (iii) availability of loans, yielding a 2 X 2 X 2 between-subjects design. Simulating consumption was one of the main challenges for this paper. We take a context-heavy approach, first by utilizing pictures and descriptions of real-world luxury items that are well outside the range of affordable items for our subjects. The 25 items consist of expensive mobile phones, famous paintings, estates, private islands, and yachts. We took care to select items that were as gender neutral as possible, which is why we did not use expensive cars or clothing/jewelery. In all treatments, subjects were shown a description of the item, but had to spend real money to view the item. In all sessions, we enforced removal of all personal items so that subjects would not be able to look up the items on the internet during the session itself. The full list of items, descriptions and prices can be found in Table A.1 in Appendix A.

It is important to note that subjects' purchasing decision was for a virtual picture of the item, with prices scaled to real-world prices. This was made clear to all subjects in the instructions, that purchasing was limited to viewing a picture of the item. This is in contrast to some of the literature involving real goods (see for example studies eliciting willingness to pay for real-world objects, such as Plott and Zeiler, 2005; Isoni, Loomes, and Sugden, 2011; among others). However, in keeping with the context of goods that signal status, it would be cost-prohibitive for

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expenditure, and those that have greater threatened self-worth are more likely to defer the disutility of expenditure. Our results are in contrast to this, however, with little possibility of any long-term deferment, we still find higher loan-taking, but cannot attribute this to those with threatened self-worth, but do attribute it to status-seeking behavior.

[8] For more on signaling behavior, see Crawford and Sobel, 1982; Glazer and Konrad, 1996; Feltovich, Harbaugh, and To, 2002; among others.

us to offer anything physical to the subjects, particularly since we use a diverse range of items as well. Hence, we chose to use virtual goods, which have considerable evidence of consumption in the real world, particularly in the gaming and technology markets (see for example, Huang, 2012; Hamari, 2015). Note, however, that we still wanted to ensure that subjects do not walk away from the experiment with no compensation (which is possible as the combined value of all items was well beyond subject endowments by design), hence we implemented a 60% rebate on all items, such that at the end of the session, subjects retain 60% of the face value of the item purchased. Hence, consumption reduces subject payoffs considerably, and the income maximizing agent will not purchase any items whatsoever, but this method ensures that subjects will walk away with a substantial proportion of their endowment.

Table 1 displays our treatments with associated number of subjects. The number of subjects in each treatment is unbalanced largely due to the nature of the experiment, some treatments required groups of 4, while others required individuals. Hence, we strove to target a minimum number of independent observations per treatment (20 for the treatments with groups of 4, and 50 for the individual treatments). We also conducted sessions with multiple treatments, with some sessions containing a handful of individual observations when the total number of subjects in the session was not divisible by 4 (so as to reduce turn-aways).

Table 1. Treatment Overview

		Baseline	Observability	Inequality	Observability X Inequality
Loans	**No**	N = 81	N = 88 (22 groups)	N = 55	N = 104 (26 groups)
	Yes	N = 66	N = 100 (25 groups)	N = 60	N = 96 (24 groups)

The baseline treatment works as follows. Subjects are provided a standard endowment (200 million tokens) over the course of 10 rounds, with each round lasting 3 minutes. Subjects are informed that in each round, they can access a tenth of their total endowment, which can be used for making purchasing decisions. In each subsequent round, subjects can access an additional 10% of their total endowment. The prices on the items (shown in Appendix A) are such that some items are immediately available for purchase (11 items), and as the endowment accumulates, more items become available, with some (4 items) becoming available in the last 5 rounds. Once an item is purchased, a picture of the item becomes available in the subject's viewing gallery for the remainder of the session and is accessible to the subject at any time. Each item can only be purchased a single time. At the end of the 10 rounds, subjects complete a

questionnaire and are paid and free to leave. In the baseline treatment, the purchasing behavior of one subject is not observable to the rest of the participants.

As mentioned earlier, our treatments vary three factors, (i) observability of purchasing, (ii) inequality (based on ability/effort), and (iii) availability of loans. Starting first with observability of purchasing, we vary this over the baseline treatment by putting subjects in groups of 4 (randomly assigned) and sharing information on purchasing among group members. It is important to note that purchasing information is not available in real time but is updated once at the beginning of each round. Hence, subjects make purchasing decisions in the first round, and their total expenditure (as well as a list of items they purchased) is available to all group members at the start of the next round. Hence, in each round from the second onwards, subjects are able to see a table with the total expenditure of each group member. Furthermore, subjects can observe the descriptions (but not the pictures) of items purchased by their group's members. Hence, purchasing behavior is observable, but the items are not. Since the items and descriptions are the same across treatments, preferences are held constant, thus differences across treatments can only be driven by the observability of purchasing, which is a key aspect of our experiment, and something that is difficult to disentangle in the empirical literature.[9] It is also important to note that this is anonymous: subjects are assigned a group ID number, and purchases are reported using this number. Other than this change, everything else is identical to the baseline.

For inequality (based on ability/effort), subjects engaged in a real effort task prior to the purchasing rounds. The effort task was a version of the coding task (Lévy-Garboua, Masclet, and Montmarquette, 2009; Erkal, Gangadharan, and Nikiforakis, 2011), which generated endowments for the subjects that were then subsequently used for purchasing. Subjects were given 5 practice rounds, followed by 10 paid rounds of 30 seconds each. These treatments have unequal endowments (corresponding with ability and effort in the coding task), as well as significantly higher levels of endowments on average (224.10 tokens per subject) than the baseline endowment of 200 tokens per subject ($p<0.01$). For this reason, all analysis expresses expenditure as a percentage of the total endowment available for comparability and interpretation. Note however, that the endowment levels of subjects are never revealed in the

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[9] In the introduction, we argue that a challenge of the empirical literature is to disentangle if rising conspicuous consumption is because of status signalling ("keeping up with the Joneses") or preferences (people develop a taste for high quality products introduced by the "Joneses"). Here, since subjects are not allowed to view the items, the preference channel is held constant across treatments. Consumption behavior is driven solely by signalling ("keeping up with the Joneses") motives.

session, hence in these treatments, purchasing behavior can carry a signal of ability and effort in the coding task. Other than this, the treatments are identical to the baseline.[10]

Finally, the loan treatments allow subjects to borrow funds from their future selves at a cost. As the total endowment accumulates over 10 rounds, subjects in these treatments can borrow funds from future rounds to finance purchases in earlier rounds. These loans come at a cost (5% of the amount being borrowed) and defaulting is not possible (the endowment in future rounds is automatically reduced by the loan amount plus 5% divided by the remaining number of rounds). In addition, subjects must borrow the full cost of the item being financed (even though they might have some funds to cover part of the purchase). This simply means that partial financing is not possible.[11] Overborrowing is also not possible (subjects can only borrow up to what their endowments can accommodate, and not more). Finally, borrowing activity is similarly never revealed to other subjects.

The survey measures a number of subject characteristics that are germane to consumption behavior. On measure is that of financial literacy (van Rooij, Lusardi, and Alessie 2011). This measure asks subjects to respond to five questions about:

- Numeracy ("Suppose you had £100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow?");
- Compound interest ("Suppose you had £100 in a savings account and the interest rate is 20% per year and you never withdraw money or interest payments. After 5 years, how much would you have on this account in total?");
- Inflation ("Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account?")
- Time value of money ("Assume a friend inherits £10,000 today and his sibling inherits £10,000 3 years from now. Who is richer because of the inheritance?")

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[10] One related question is that of our implementation of inequality, and the choice to make it effort based. As we note, Clingingsmith and Sheremeta (2018) found that unequal but randomly assigned endowments had no impact on consumption behavior. An alternate strategy we could have implemented (following them) was to implement random endowments, rather than earned endowments, in our baseline. This design choice is not critical for us, however, as we are mainly interested in the effects of loans and on inequality. That being said, implementing random but unequal endowments in our baseline would have resulted in a more closely matched replication of Clingingsmith and Sheremeta (2018), but would not affect any of our main findings.

[11] The reason for not allowing partial borrowing was to make the instructions and the interface very simple for our subjects. Borrowing partial amounts would require our subjects to engage in complex calculations. Assuming full borrowing allowed us to make all calculations explicit for the subjects. This design choice should have no impact on our estimates, however, as borrowing was implemented identically in treatment and control. However, the magnitude of the effect may well be larger relative to a partial borrowing design choice. Our data does not allow us to account for this.

- Money illusion ("Suppose that in the year 2010, your income has doubled and prices of all goods have doubled too. In 2010, how much will you be able to buy with your income?")

Our measure of financial literacy is simply the sum of all correct answers to the questions. 24.5% of our sample got all five answers correct, while 57.0% for at least four answers correct. In addition to this, we also measure real-world consumption behavior. We ask four questions and simply add up the responses, with higher numbers indicating greater consumption. The four questions are:

- Thinking about this past week… How frequently did you eat out?
- Thinking about this past week… How frequently did you go for a drink?
- Thinking about this past week… How frequently did you go see a movie?
- Thinking about this past week… How frequently did you buy something and returned it?

This measure of real-world consumption behavior is particularly important because it allows for us to test whether real world consumption behavior is correlated with consumption in our experiment. Across all treatments, we find that consumption in our experiment is significantly correlated with the real-world consumption measure ($p<0.05$), giving us some confidence that our simulated consumption reflects (at least to some degree) real-world consumption behavior.

In addition to these, we also use measures of competitiveness (based on the 13-item scale of Houston et al. 2002), engagement (based on the Cognitive Reflection Test of Frederick, 2005), state of personal finances, and clarity of instructions, in addition to gender and age. Table 2 displays summary statistics across treatments. Note that the control variables are balanced across treatments (joint F-test of a model with treatment dummies: $p>0.15$) with the exception of our outcome variables, expenditure and loans. The treatments with the effort tasks are also balanced with the exception of the treatment without observability, but with loans available, which is significantly higher than the ability-signals by itself (p=0.031), and the treatment with all three factors ($p<0.01$), but not significantly different from the treatment with observability (but not loans; $p=0.147$). Our main dependent variables account for these differences since they are expressed as a percentage of endowment (as stated earlier).

Table 2. Summary statistics

Variable	No loans				Loans			
	Baseline	Observability	Inequality	Observability X Inequality	Baseline	Observability	Inequality	Observability X Inequality
Observations	81	88	55	104	66	100	60	96
Independent Observations	81	22	55	26	66	25	60	24
Endowment (tokens per round)	20	20	21.95	22.82	20	20	23.78	21.38
Total expenditure (%)	63.9%	52.3%	65.1%	69.8%	59.0%	50.9%	39.5%	54.4%
Total loan (%)	--	--	--	--	20.8%	11.4%	5.0%	13.1%
Total items purchased (#)	6.21	4.47	7.31	6.99	5.77	5.22	4.37	6.05
Earnings (in £)	9.30	9.88	10.09	10.29	9.42	9.88	12.59	10.40
Consumption (self reported)	4.93	3.86	3.85	4.46	4.47	4.14	3.98	4.46
Financial IQ	3.68	3.35	3.49	3.38	3.65	3.55	3.70	3.47
Competitiveness	2.66	2.63	2.72	2.71	2.79	2.62	2.75	2.67
State of personal finances	3.02	3.23	3.04	3.07	2.88	3.09	3.20	2.86
Cognitive Reflection Test	0.88	0.94	1.31	1.25	1.02	1.04	1.02	1.15
Clarity of instructions	3.78	3.83	4.05	4.05	3.73	3.78	4.00	3.83
Gender (Female = 1)	58.0%	51.1%	65.5%	53.8%	53.0%	54.0%	56.7%	63.5%
Age (years)	20.80	21.35	21.53	21.69	21.44	21.44	20.80	21.82

III.   Results

III.1 The Effects of "Conspicuous-ness" on Consumption

To set the stage, we present our first set of findings regarding about the effects of consumption observability ("conspicuous-ness") under two conditions: when endowments are equal (and consumption carries no signal of ability), and when endowments are unequal (and consumption carries a signal of ability). Recall that the experiment is set up such that any form of consumption is inefficient from a purely income-maximizing perspective. This means that consumption carries pecuniary costs but contains non-pecuniary benefits. We find that subjects consume quite substantially[12]. In the baseline (equal endowments but with no observability), subjects spent an average of 61.71% of their endowment on pictures of virtual items, with 26% of the sample spending 10% or less of their endowment, and 32% spending all their endowment. Hence, the distribution is clearly bi modal, with a strong mode at spending nothing (9% of the sample) and another at spending everything (32% of the sample).

The first set of treatments increases observability when endowments are equal. In this treatment, subjects are randomly placed into groups of 4, with no identifying information and means of communication (besides purchasing behavior). Recall that, like in the baseline, each subject is given an equal and fixed endowment of 200 tokens (common knowledge). Subjects know what other group members purchased but cannot observe the item itself. Subjects are shown the total expenditure of each of their group members, along with their own. In this equal endowment observability environment, as the first two columns of Figure 1 show, expenditures (as a percentage of endowment) are 10 percentage points lower than the baseline (51.57% - two-tailed t-test using group averages *p=0.128*). This indicates that when consumption carries no signal of ability, observability reduces (costly and irrational) consumption. This behavior is consistent with the relative income hypothesis: since subjects earn the same (unconditional) endowment, higher consumption reduces earnings, and as long as subjects care about relative earnings, we would expect observability to reduce expenditures overall.

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[12] As explained earlier, part of the reason is the rebate. Subjects receive 60% of their expenditure back at the end of the experiment, so they are certain to earn some money (there is a cost of 40% of the ticket price of the item that they incur, which may independently seem low give the total cost of the item). In addition to this, the protocol was careful to ensure that subjects did not have access to any personal items during the experiment. Hence, sitting and staring at the screen for 30 minutes (3 minutes per round for 10 rounds) would be considered quite boring, and hence this expenditure allays boredom (which is one potential non-pecuniary benefit).

The next set of treatments manipulates the way the endowment in allocated. In these treatments, endowments are unequal, and determined by effort in an earlier effort task. One aspect of earned endowments, however, is the house-money effect (Ackert et al. 2006; Weber and Zuchel, 2005; Cardenas et al. 2014). For this set of treatments, subjects earned an average of 224.1 tokens on average, which was significantly higher than the 200-token endowment in the baseline set of treatments. To account for this difference in endowment levels, our dependent variable is expenditure expressed as a percentage of total endowment. Since subjects spent effort raising resources that would be used for consumption, the house money effect predicts that subjects would make decisions that are closer to income maximization. Indeed, as the third column of Figure 1 shows, subjects spent 10 percentage points less of their endowment in this set of treatments with unobservable expenditure (two-tailed t-test $p<0.10$) relative to the control (with equal endowments). This level of expenditure was nearly identical to the treatment with equal endowments, but observable expenditure ($p=0.980$).

Our fourth and final treatment implements observability in the earned endowment condition, which now allows for conspicuous consumption (higher levels of consumption signal higher endowments). The combination of effort task and conspicuous consumption implies that consumption can now signal ability. What is striking is the opposite pattern we observe to the equal endowment treatments. As the third and fourth column of Figure 1 show, with effort-based inequality, including observability increases average expenditure by 10 percentage points to 62.44% ($p=0.120$)[13]. Taken together, what these results show is that when endowments are equal, observability induces subjects to spend less, but when expenditure can signal ability (even with no possibility of reputation gains outside the lab), consumption increases. This is consistent with the findings previously established in Clingingsmith and Sheremeta (2018). Figure 1 displays these results (pooled with the loan treatments). Separate graphs with and without loans are available in Appendix B - Figures B.1 and B.2.

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[13] The expenditure in this set of treatments is nearly the same amount of expenditure as the baseline treatment (see columns 1 and 4 of Figure 1).
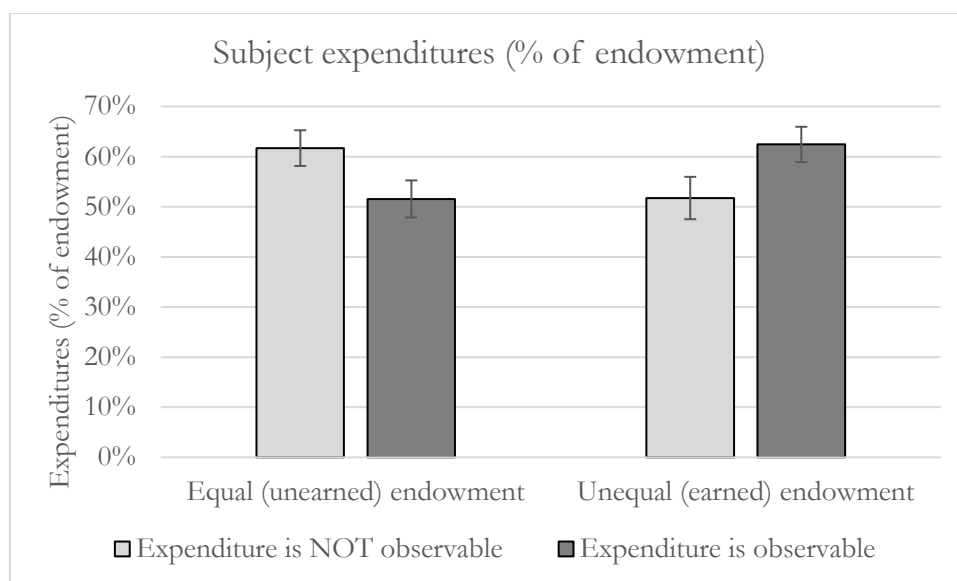
Figure 1: Subject expenditures per treatment

Note: The error bars reflect the standard error of the mean. The figure pools data from treatments with and without loans. For separate figures with and without loans, please see the appendix.

Next, to test the effects of the treatments, and particularly whether the effects of observability differ across the endowment conditions, we use a simple OLS framework with the dependent variable as the total tokens spent by the subject, expressed as a percentage of their total endowment. As mentioned above, we pool the No Loan and Loan treatments to increase power. Nevertheless, we control for the Loan treatments (model 2), along with controls for self-reported consumption, financial IQ, competitiveness, and state of personal finances (model 3). Finally, model 4 adds controls for score on the Cognitive Reflection Test, clarity of instructions, gender and age.

Table 3: Subject expenditures per treatment

Dependent Variable: Expenditure (% of endowment)				
	I	II	III	IV
Treatment: Observability	-0.101**	-0.094*	-0.087*	-0.088*
	(0.05)	(0.05)	(0.05)	(0.05)
Treatment: (Effort-based) inequality	-0.100*	-0.092*	-0.085	-0.074
	(0.06)	(0.05)	(0.06)	(0.05)
Interaction: Observability X Inequality	0.208***	0.195***	0.175**	0.170**
	(0.08)	(0.07)	(0.07)	(0.07)
Loans		-0.108***	-0.104***	-0.110***
		(0.04)	(0.04)	(0.04)
Consumption (self-reported)			0.013**	0.012**
16 = High			(0.01)	(0.01)
Financial IQ			-0.047***	-0.033**
5 = High			(0.01)	(0.02)
Competitiveness			0.058*	0.038

5 = Highly competitive			(0.03)	(0.03)
State of personal finances			-0.007	-0.002
5 = Very good			(0.02)	(0.02)
Cognitive Reflection Test				-0.037**
3 = High				(0.02)
Clarity of instructions				-0.019
5 = Always clear				(0.02)
Gender				0.027
1 = Female				(0.04)
Age (in years)				0.016***
				(0.00)
Constant	0.617***	0.666***	0.637***	0.394**
	(0.04)	(0.04)	(0.13)	(0.17)
R-squared	0.015	0.031	0.063	0.088
P	0.051	0.004	0.000	0.000
Observations	650	650	650	650

Notes: OLS regressions. The dependent variable is the proportion of total endowment that was spent. * 10%, ** 5%, *** 1% significance level. Clustered standard errors (by group) in parentheses.

Model 1 in Table 3 is the simplest model, controlling for treatment effects, and broadly confirms what we observe in Figure 1 above. When expenditure is observable, but endowments are equal (and hence, expenditure carries no signal of ability), expenditure is significantly reduced by our subjects ($p<0.05$ in model I, $p<0.10$ in model IV). This suggests that subjects understand that consumption is "wasteful" and hence, reduce their consumption levels when it endowments are unearned, and expenditure is observable by others. However, when endowments are unequal (and expenditure signals ability), the effect of observability is significantly higher, relative to when endowments are equal ($p<0.01$ in model I, $p<0.05$ in model IV). As seen in the figure, the models confirm the result that the observability of consumption has an additional effect when ability signals are present, relative to when they are not. When consumption can be conspicuous (i.e. can signal ability), expenditure increases when others can observe purchasing behavior, implying that the urge to signal ability outweighs the concern that "wasteful" consumption can be viewed by others. When consumption is inconspicuous (carries no signal of ability), expenditure reduces when others can observe purchasing because the urge to signal ability is no longer there.

In addition, our measure of (self-reported) real-world consumption[14] has a positive and significant relationship with expenditure in the game ($p<0.05$ in model IV), indicating that (to some degree) real world consumption patterns are being captured by our game. We also find

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[14] This is simply a sum of responses to our four consumption questions described earlier.

significantly less expenditure in the loan treatments (*p<0.01* in model IV), which we discuss in Section III.2. However, for now it is important to note that the dependent variable is overall expenditure, and since loans have subjects borrowing against their future selves, to some degree this reduction is mechanistic, as loans are costly, reducing the overall amount available to spend. In addition to this, we also find that subjects spend significantly less in the final rounds when loans are available, and this reduction in spending is higher than the increase in spending (due to loans) in the first few rounds.[15]

III.2 Loans and Conspicuous Consumption

In this section (III.2) and the next (III.3), we present our core set of results about the effect of access to loans on consumption and inequality. In this section, we show that loan-taking increases when consumption becomes conspicuous, and the increase in loan-taking is driven primarily by individuals with lowest income. To reiterate, loans were implemented in the following way: subjects were informed that in each round they could borrow from their future earnings stream at a cost of 5% of the total amount borrowed. Clearly, loans are costly. This cost is then added to the amount taken as a loan, and then evenly divided across the remaining rounds of the game. Subject endowments are reduced by this amount in each round (no possibility of default). In addition, subjects are unable to borrow more than their endowment can (no possibility of over-borrowing). As endowments are cumulative, loans are only reasonable in the earlier rounds, when a majority of the items are not feasible for purchase. Note that borrowing (i.e. taking loans) is not observable.

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[15] In addition, two further effects are noteworthy. The first is that of Financial IQ, which is a count of the number of correct answers provided to the financial questions that demonstrate a basic understanding of money. Those that scored higher on these questions spend a significantly lower proportion of their overall endowment (*p<0.05* in model IV). At first glance, this might have had to do with an understanding of our game (arguably, those that scored higher also understood the instructions better), however we also control for subject reported clarity of instructions and find no significant effect there (*p=0.311* in model IV). Similarly, one might interpret this correlation stemming from those that are paying attention, in that those that pay more attention are more likely to score higher on the finance questions relative to their counterparts. However, we also control for attentiveness using the Cognitive Reflection Test and do indeed find that those that score higher on the CRT, consume less (*p<0.05*) across all treatments. In our view, this constitutes as evidence that for those with a better understanding of financial matters are less likely to consume in our game, similar to consumption patterns one might find outside the lab. This provides further evidence that behavior in our game corresponds with behavior in real life. Finally, we also note that older subjects are more likely to consume more, relative to younger subjects (*p<0.01*), which does not seem to be a function of outside resources (state of personal finances is insignificant, *p=0.917*), but could well be a function of the types of items we selected, in that older subjects may find these items more attractive. However, we do not have a clear explanation for why older subjects consume more, especially since the age range of our sample is largely clustered between 18 and 22, with a long tail (our oldest participant was 42). Age does not systematically vary by treatment either (regressing age on treatment, joint F-test *p=0.362*).

Figure 2 displays the total amount of loans taken by treatment for each of our four treatments where loans are available. Loans are expressed as percentage of endowments to account for differing endowment levels in the inequality treatments. The highest amount of loan taking is recorded in the baseline condition (endowments are equal, and expenditure is not observable), while the lowest is found in the treatment where endowments are unequal, and expenditure is not observable. Comparing loan-taking in these two treatments, it is clear to see that the house money effect is clearly at play here. Loans are far less prevalent when subjects earn their endowments, relative to when subjects are given equal endowments ($p<0.01$).

Importantly, however, as with expenditures, observability reduces loan-taking when endowments are equal ($p<0.05$), but increases loan-taking when endowments are unequal, and effort based ($p<0.05$). In other words, a cursory look at the graph reveals that when consumption can signal ability, subjects are more likely to take on loans to front load consumption.
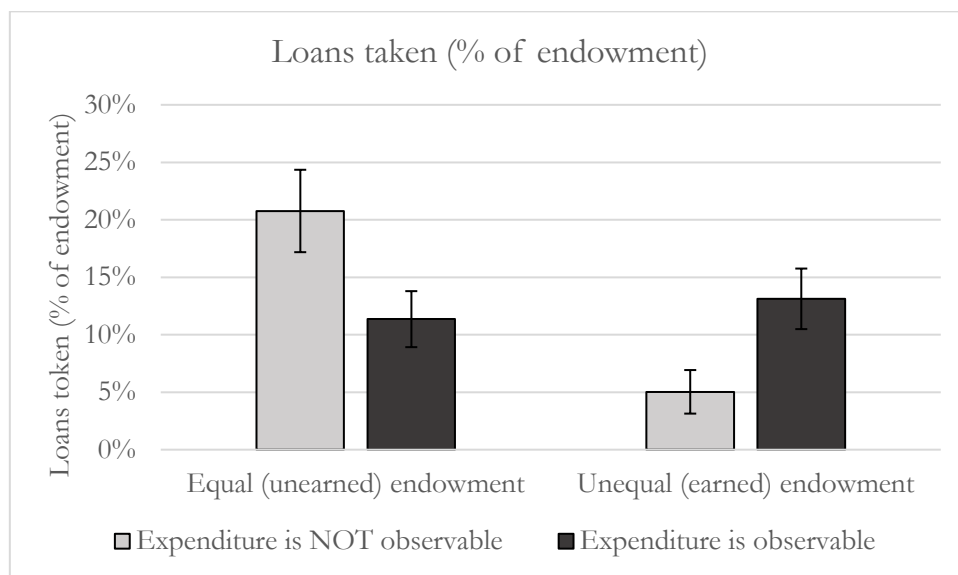

Figure 2: Loans taken by treatment
Note: The error bars reflect the standard error of the mean. The figure reports data from the treatments with loans.

As with expenditures, we use a simple OLS framework with the dependent variable as the total tokens taken in loans by the subject, expressed as a percentage of their total endowment. Specifically, we test the hypothesis that observability increases loan-taking when consumption signals ability, relative to when consumption carries no such signal. We control for self-reported consumption, financial IQ, competitiveness, and state of personal finances (Model 2), the Cognitive Reflection Test, and clarity of instructions (Model 3), and finally, gender and age (Model 4).

Table 4: Loans per treatment

Dependent Variable: Loans taken (% of endowment) - Loans Treatments				
	I	II	III	IV
Treatment: Observability	-0.094**	-0.090**	-0.090**	-0.091**
	(0.04)	(0.04)	(0.04)	(0.04)
Treatment: (Effort-based) inequality	-0.157***	-0.153***	-0.157***	-0.145***
	(0.04)	(0.04)	(0.04)	(0.04)
Interaction: Observability X Inequality	0.175***	0.165***	0.172***	0.157***
	(0.05)	(0.05)	(0.05)	(0.05)
Consumption (self reported)		0.004	0.003	0.003
16 = High		(0.00)	(0.00)	(0.00)
Financial IQ		-0.028**	-0.021	-0.022*
5 = High		(0.01)	(0.01)	(0.01)
Competitiveness		0.035	0.032	0.033
5 = Highly competitive		(0.02)	(0.02)	(0.03)
State of personal finances		0.000	0.001	0.006
5 = Very good		(0.01)	(0.01)	(0.01)
Cognitive Reflection Test			-0.023**	-0.023**
3 = High			(0.01)	(0.01)
Clarity of instructions			0.012	0.008
5 = Always clear			(0.01)	(0.01)
Gender				-0.027
1 = Female				(0.03)
Age (in years)				0.018***
				(0.00)
Constant	0.208***	0.196*	0.156	-0.222
	(0.04)	(0.11)	(0.12)	(0.16)
R-squared	0.044	0.073	0.085	0.152
P	0.001	0.000	0.000	0.000
Observations	322	322	322	322

Notes: OLS regressions. The dependent variable is the proportion of total endowment that was spent. * 10%, ** 5%, *** 1% significance level. Clustered standard errors (by group) in parentheses.

Table 4 displays the results of the OLS regressions. We find similar results as with the expenditure regressions. When endowments are equal, observability significantly reduces the amount of loans taken ($p<0.05$ in model I, $p<0.05$ in model IV) in line with what we observe in the figures. When subjects earn their endowments, the amount of loans is also reduced, similar to what we observed earlier, a finding we attribute to the house-money effect ($p<0.01$ in models I and IV). Importantly, however, when purchasing is observable, and when this purchasing can signal ability, the amount of loans taken significantly increases ($p<0.01$ in models I and IV), as subjects front-load their consumption. This pattern is robust to a series of controls. Importantly, however, we don't observe a significant relationship with self-reported consumption ($p=0.425$ in model IV), but those with higher financial IQ taken lower levels of

loans (*p<0.05* in model II, *p<0.10* in model IV). In addition, those that score higher on the Cognitive Reflection test are significantly less likely to take on loans (*p<0.05* in model IV), while those that are older are more likely to take on loans and front load their consumption (*p<0.01* in model IV).

Our next question has to do with the income strata that takes on the most amount of loans when consumption becomes observable. Note that in our lab environment, undertaking loans provides no pecuniary benefits for our subjects. Indeed, because of the costs of borrowing, undertaking loans in an effort to front-load consumption is costly. In order to study this in detail, we construct pseudo groups in the treatment where endowments are unequal and effort-based, but expenditure is not observable by group members, and loans are available. We compare expenditure in this treatment with the treatment where expenditure is observable to other group members.[16] Once we do this, we can then split subjects by income strata, with the lowest endowment subjects classified as the lowest income strata in a given group, and highest endowment subjects classified as the highest income strata in a given group (ties are randomly broken). We can then study expenditure patterns by treatment and income strata so as to identify the effect of observability on expenditure by income strata. This exercise yields the effect of the "conspicuous-ness" of consumption on loan-taking by income strata.
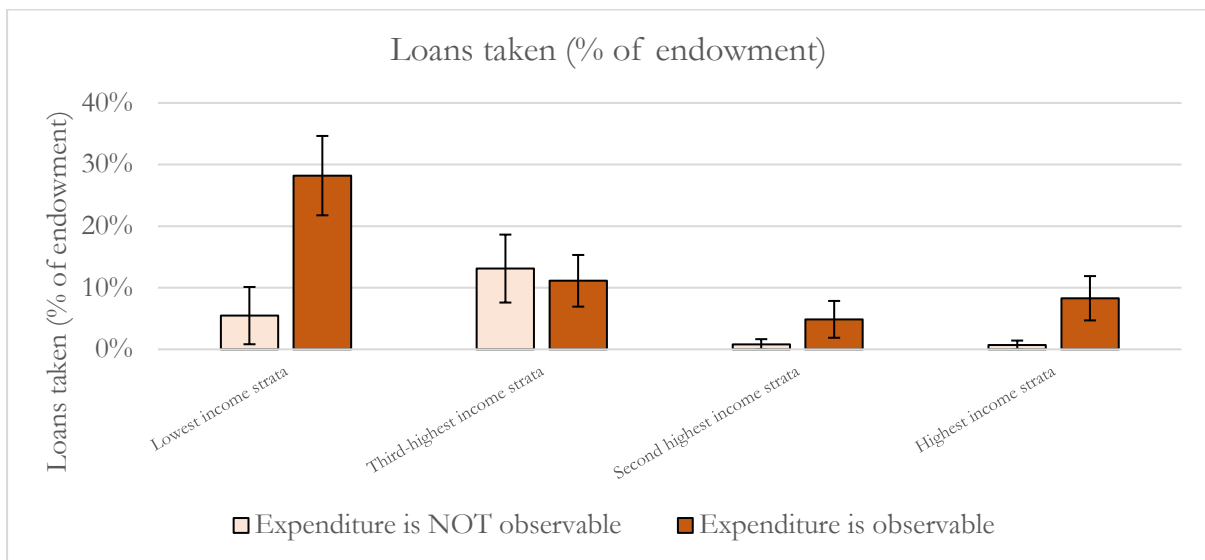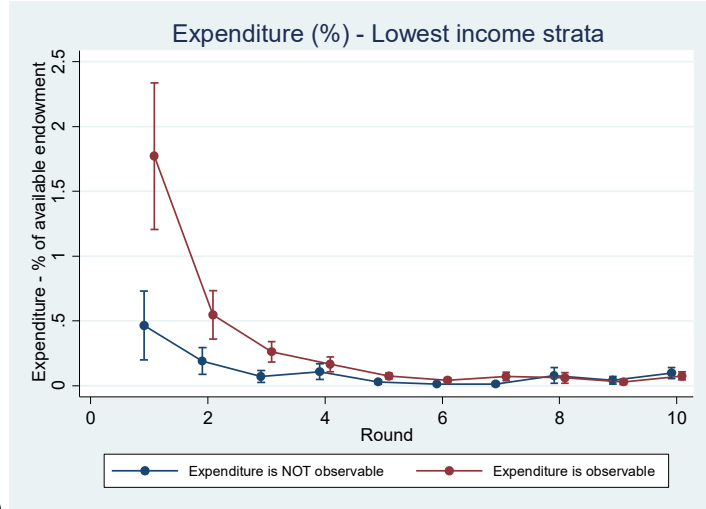

Figure 3: Loans taken by treatment and income strata – Unequal (effort-based) endowment treatments
Note: The error bars reflect mean the standard error of the mean. The figure reports data from treatments with unequal endowments and with loans.

[16] The reason for constructing pseudo groups is that groups were not constructed in the treatments where expenditure is not observable. However, we can construct the groups in the same manner as the observability treatment so as to get the closest comparison groups. What this means is that subjects are randomly assigned to groups within the same session.

Subjects in the lowest income strata increase borrowing the most when consumption becomes conspicuous. Figure 3 presents these results: the lowest income strata borrowed 5% of their total endowment (10 tokens on average) when expenditure was not observable, which increases to 28% of their total endowment (44 tokens on average) when their expenditure was observable, a statistically significant increase in loan-taking ($p<0.05$). For the third highest income strata, the difference between treatments is not significant ($p=0.774$), with 13% of their endowment (29 tokens on average) taken without observability, and 11% of their endowment (22 tokens on average) taken with observability. For the second highest income strata, again the difference in treatments is not significant ($p=0.302$), with 1% of the endowment (2 tokens on average) taken without observability, and 5% of their endowment (11 tokens on average) taken with observability. For the highest income strata, the difference is not significant ($p=0.108$). Without observability, subjects borrow about 1% of the endowment (2 tokens on average). This increases to 8% of the endowment (22 tokens on average) borrowed with observability. This provides some (weak) evidence in favor of the highest income strata increasing their level of borrowing as well as the lowest income strata. Our findings provide evidence to support the argument that inequality may yield sub-optimal outcomes: subjects in the lowest income strata borrow (at a costly rate) due to status signaling. This finding can explain many real-life observations, for example, that poorer and low credit US households increase their borrowing in the run-up to the Great Recession (Mian and Sufi, 2011, 2015).

Detailed breakdown of expenditure over the 10 rounds provides a clear picture of how loans are used (Figure 4). For the lowest income strata, with no observability, subjects spend 38% of their endowments on average, which with observability, this expenditure increases to 69% ($p<0.05$), with the few first rounds witnessing the most dramatic increase in expenditure, thanks to access to loans (Figure 4a). For the highest income strata, the increase in expenditure is also significant, with subjects spending 19% of their endowment without observability, and 47% with observability ($p<0.05$). The increases are also the most significant in the first few rounds. In percentage terms, these are very similar increases between these two stratas, though subjects in the lowest income strata use financing to fund their expenditure. The increases for the middle-income strata are not significant ($p=0.653$ and $p=0.688$ for the third and second highest income strata respectively).
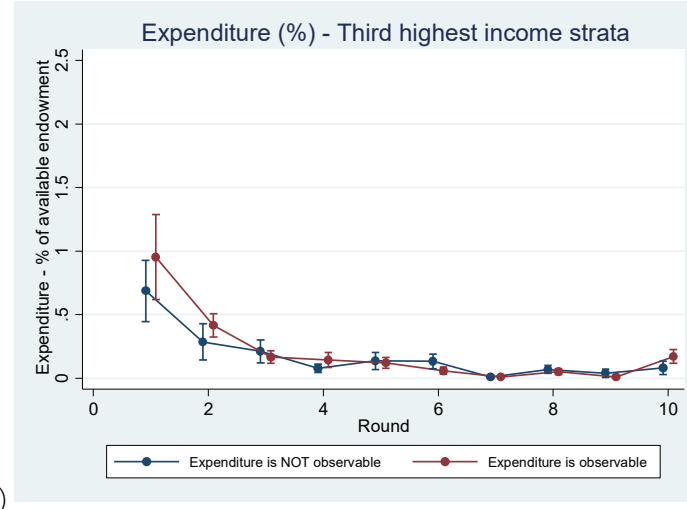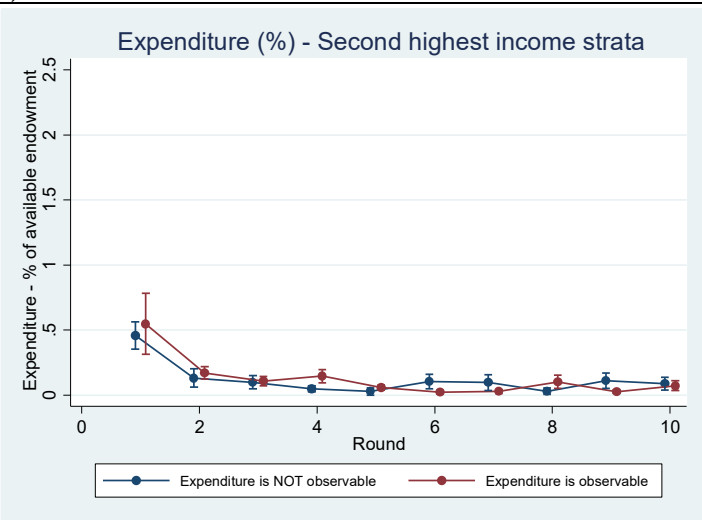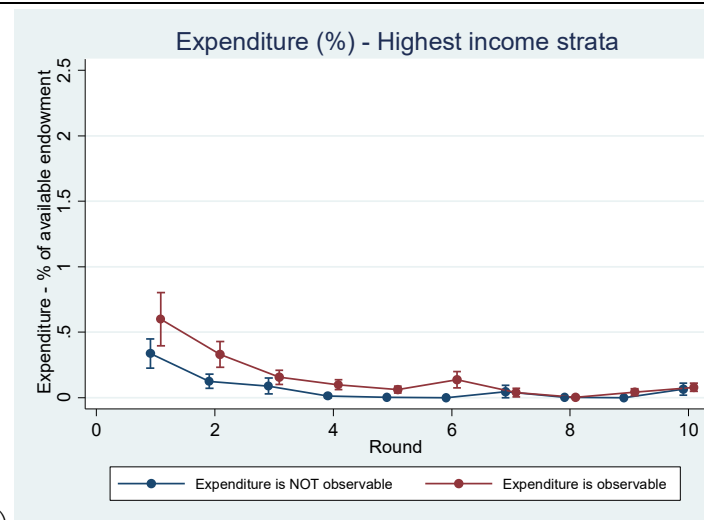
Figure 4a-d: Expenditure over rounds by treatment and income strata – Unequal endowments with loan treatments

III.3 Loans, Conspicuous consumption, and Inequality

In this section, we present our most important results, namely access to credit in the presence of conspicuous consumption worsens inequality. This finding has a powerful implication, that inequality and access to costly credit in the presence of conspicuous consumption could create a vicious cycle, in which inequality encourages more costly loan-taking from the poorest groups, which in turn damages the financial conditions of these individuals and exacerbates inequality.

First, we would like to note that in our experiment, the availability of loans *on average* reduce spending. Figure 5 displays expenditures over the 10 rounds across all treatments, with and without loans. Subjects generally front-load consumption: when loans are available, expenditure is significantly higher in the first few rounds, and significantly lower in the last few rounds, relative to when loans are not available. Note however, that while subjects increase their spending in the first few rounds with loans, this increase is not as high as the reduction in spending in the last few rounds. What this suggests, is that average expenditure is lower in the loan treatments, relative to when loans are not available. Indeed, this is precisely the result reported earlier in Table 3, where the loan treatments had significantly lower expenditure. Some of this reduction in spending is mechanistic. Since loans are costly, the more subjects take on loans, the less there is to spend in the final rounds.

What interesting is that in the treatment of inequality and conspicuous consumption (corresponding to Figure 5d), most of the reduction in expenditure in the loan treatments came from those at higher income levels. When expenditures are broken down by income strata in these treatments (displayed in Figure 6), loans significantly reduce expenditures of the highest income strata (a reduction of 20.3 percentage points, $p<0.10$) and of the second highest income strata (a reduction of 34.3 percentage points, $p<0.01$). By contrast, the third highest income strata also had a reduction, but this was not significant (8.1 percentage points, $p=0.489$), and the lowest income strata had an increase, but it was also not significant (1.1 percentage points, $p=0.920$). The findings suggest that the availability of loans exacerbates inequality since it mostly helps reduce consumption by higher income strata.
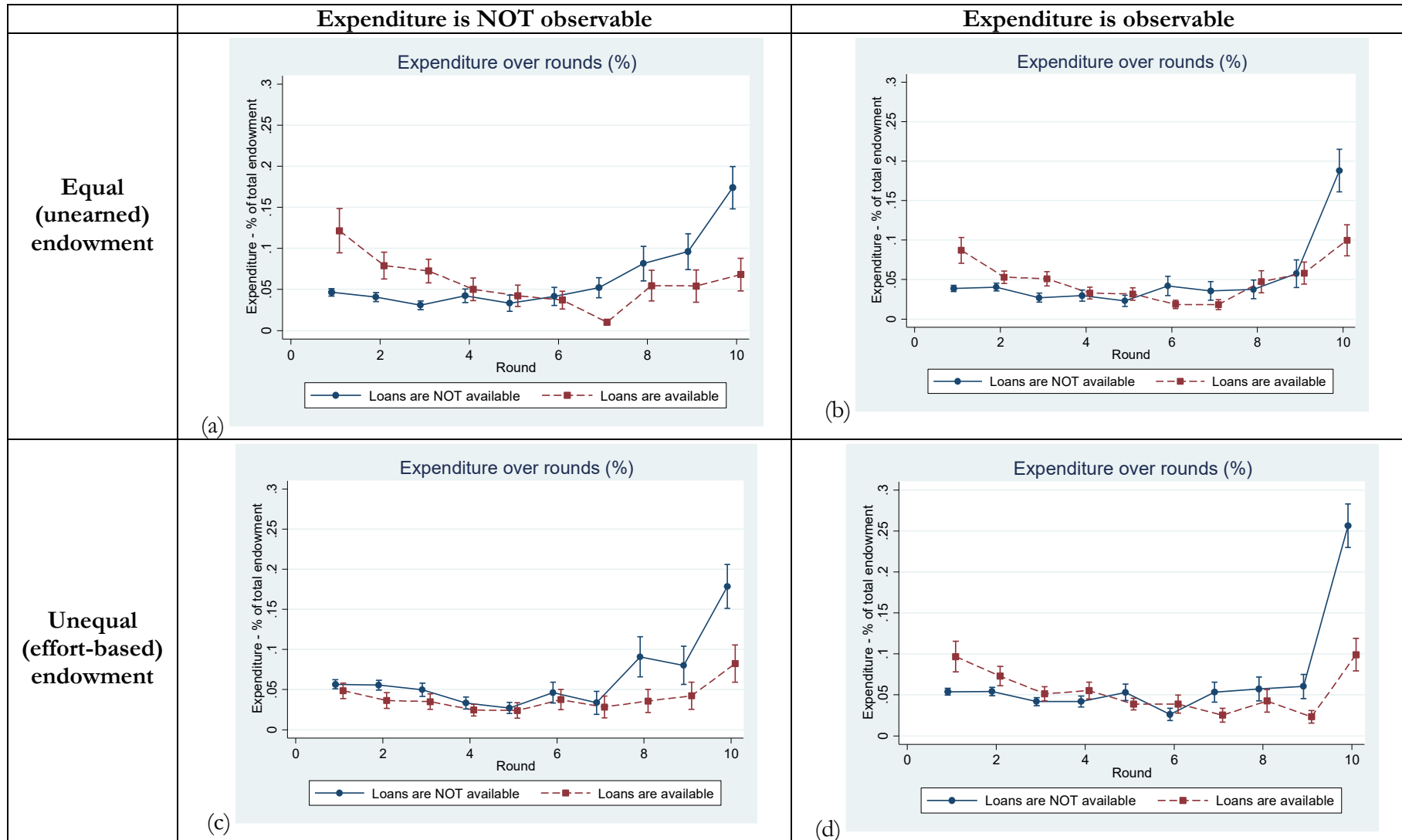
	Expenditure is NOT observable	Expenditure is observable
Equal (unearned) endowment	(a)	(b)
Unequal (effort-based) endowment	(c)	(d)

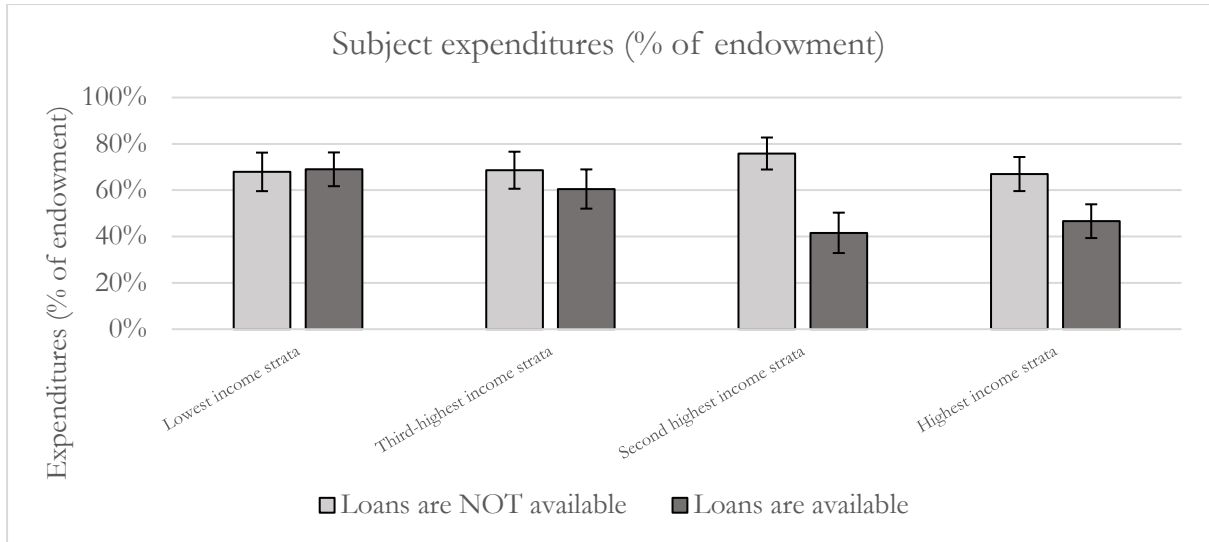**Figure 5a-d: Expenditure over rounds – All treatments**

Figure 6: Subject expenditure by treatment and income strata – Conspicuous consumption treatments

Note: The error bars reflect mean the standard error of the mean. The figure reports data from the conspicuous consumption treatments (unequal endowments with observability) with and without loans.

To establish the effects of this finding on inequality, we construct a measure of inequality as an individuals' income as a share of the group's total income.[17] We construct this measure in two ways, once before the consumption phase (which is the initial relative income directly attributable to the effort task), and once after the consumption phase (which reflects both inequality due to the effort task as well as the consumption and borrowing decisions). The difference between these two measures gives us the change in income share due to consumption decisions (purchasing and interest payments). Figure 7 displays the change in income share in our conspicuous consumption treatment, broken out by income strata, with and without loans. When loans are not available, the income shares of all income groups generally do not significant change after consumption. However, when loans become available, the income shares of poorer strata decrease, implying worsening inequality. For the lowest income strata, the availability of loans significantly reduce their income share ($p<0.05$). We observe no significant reductions in any other income strata, with the third highest income strata lower, but not significant ($p=0.349$), the second highest income group showing a significant increase in income share ($p<0.05$), and the highest income strata displaying an increase, but this is not significant ($p=0.679$). What is clear, however, is that due to the lowest income group borrowing to signal status, loans exacerbate inequality.

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[17] For example, persons 1 and 2 have 200 tokens each, persons 3 and 4 have 300 tokens each. Persons 1 and 2's income as a share of the whole group's income is 20%; persons 3 and 4's income as a share of the whole group's income is 30%.
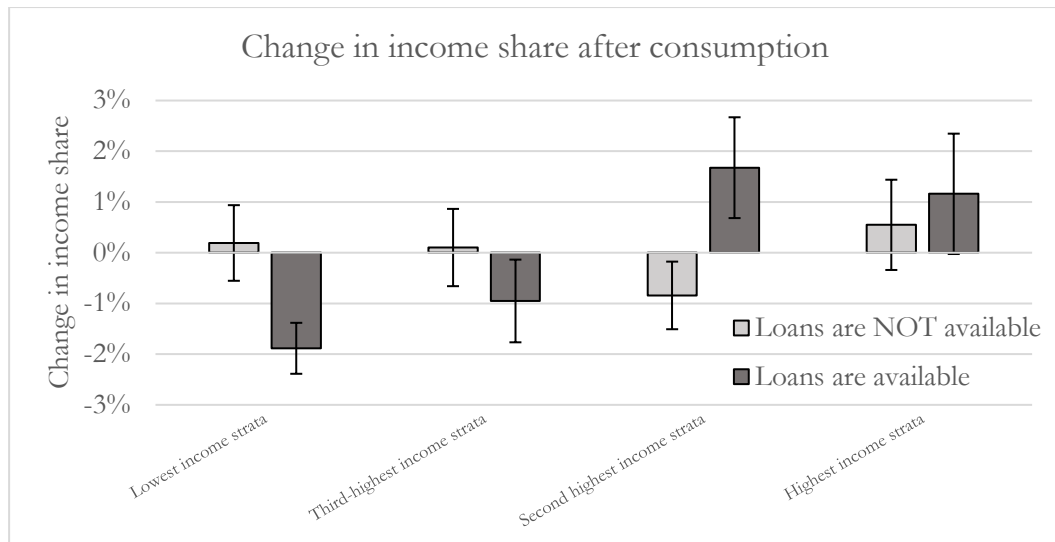
Figure 7: Change in income share with and without loans – Conspicuous consumption treatments

Notes: The bars indicate the difference in income share held by each income strata with and without consumption. The change reflects the final income share of subjects after the consumption phase, less the income share of subjects before the consumption phase. The error bars reflect mean the standard error of the mean.

The next and final component of this analysis is to examine expenditure over time by treatment and income group for the two conspicuous consumption treatments in the above comparison. Since borrowing really only makes sense in the first few rounds (as subjects borrow from their future selves), the first 3 rounds are the most relevant. What is immediately clear from the Figure 8 is that the lowest income strata respond to access to loans by increasing their expenditure in the first three rounds, which explains the aggregate increase in loans analyzed earlier. The lowest income strata increase their expenditure from 9.9 tokens to 27.1 tokens on average in the first round ($p<0.05$), while similar increases are not found for the other strata, with the highest income strata's expenditure *decreasing* from 17.7 tokens without loans, to 15.7 tokens with loans in the first round ($p=0.737$).[18] From this, it is clear to see that subjects in the lowest income strata increase their expenditure in the first few rounds in order to keep up with the others in their group, but other income strata do not do the same.

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[18] We observe similar patterns in rounds 2 and 3 as well. For example, expenditure for the lowest income strata increases in round 2, from 9.3 tokens to 17.6 tokens, though this difference is not significant ($p=0.18$). Expenditure in round 3 is again significantly different for the lowest income strata, increasing from 4.3 tokens to 13.8 tokens ($p<0.05$). For the other income strata expenditure is not significantly different in rounds 2 and 3, with the exception of the second highest income strata who significantly reduce expenditures in both rounds ($p<0.05$ and $p<0.10$ respectively).
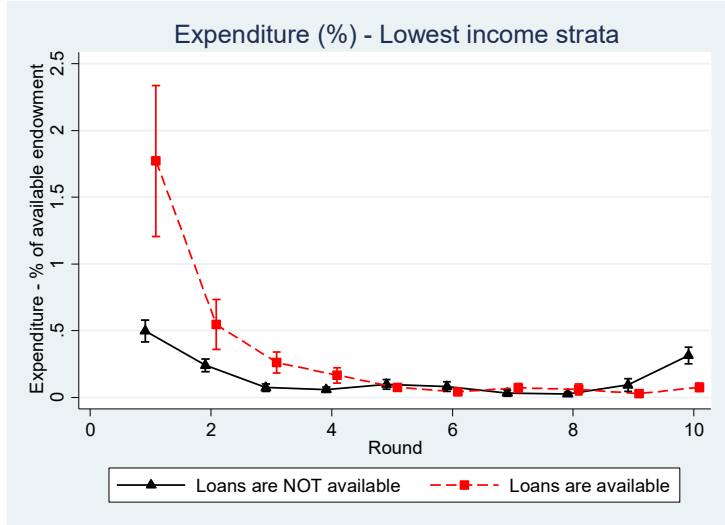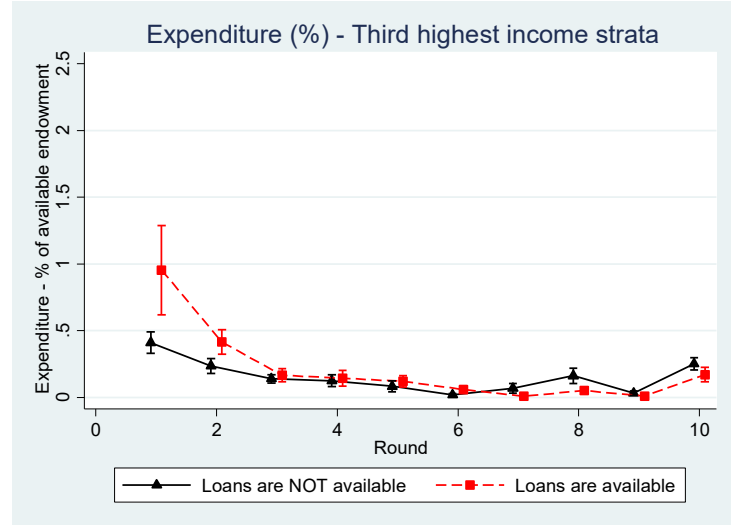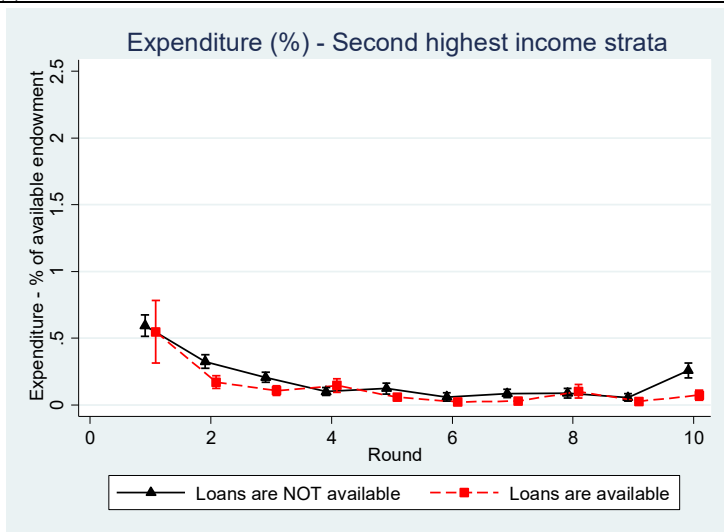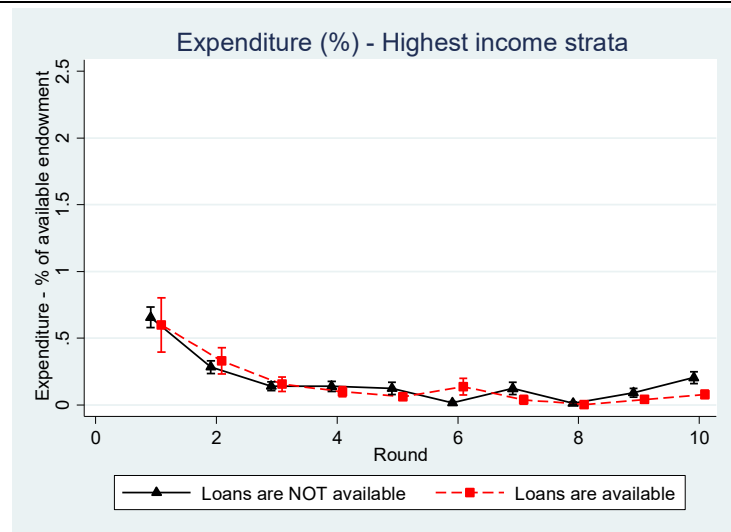
Figure 8a-d: Expenditure over rounds by treatment (Loans) and income strata – Conspicuous consumption treatments

Taken together, these results provide experimental evidence supporting the nexus between conspicuous consumption, access to finance and inequality. Subjects increase consumption when purchases are observable and can signal ability and effort, even in an abstract situation where ability signals carry no pecuniary value to the subjects. Furthermore, the availability of loans allows subjects to front-load purchasing. This loan-taking is most pronounced in the low-income strata, that take on loans to signal ability, but not in others, indicating a "catching up effect". In the presence of conspicuous consumption, access to credit could encourage higher costly borrowing by lowest income groups, and thus worsen inequality.

IV.   Conclusion

The 18th century economist and sociologist Thorstein Veblen noted the importance of pecuniary emulation: those with lower levels of status consuming more in a bid to emulate those with higher status. While there has been some empirical work seeking to document differences in consumption and borrowing patterns in line with this type of emulation, the evidence on this has been fairly suggestive. Hence, clear evidence supporting the mechanism is largely missing in the literature. Using a novel lab experiment implementing conspicuous consumption, access to credit, and status signaling, we report three main findings: First, consumption increases when it is conspicuous (i.e. can signal status and is observable by others). Second, the use of loans increases when consumption is conspicuous. This increase in loan-taking is driven by those at the bottom of the status distribution. Finally, due to this increase in loan-taking, inequality is further exacerbated: those at the bottom borrow to signal status, and this borrowing further increases inequality.

Our interpretation of these results is that they provide clear evidence in favor of pecuniary emulation and provide a caution on access to finance, especially if accompanied by inequality and "keep up with the Jones" incentives. What is perhaps the most striking feature is that these results hold in an environment that has no possibility of post-game interaction, nor any impact outside the lab. As Veblen noted, "Among the motives which lead men to accumulate wealth, the primacy, both in scope and intensity, therefore, continues to belong to this motive of pecuniary emulation" (Veblen, 1899, pg. 27).

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Appendix A

Table A.1: Virtual items list available for purchase

Item Number	Item type	Name/Brand	Actual Price in GBP	Experiment price (in millions)	Description
1	Phone	GoldVish Le Million	1,049,995.97	1.00	Goldvish "Le million" is designed by renowned designer Emmanuel Gueit and is among the world's most expensive mobile phones. This designer phone is bejewelled with 18k white gold and 20 carats of VVS1 diamonds.
2	Phone	King's Button	1,211,550.00	2.00	The renowned jeweller from Austria, Peter Aloisson is the creator of the King's Button phone. 138 diamonds are installed on this phone, with a beautiful 6.6 carat white diamond serving as the home screen button.
3	Painting	Pablo Picasso, The Weeping Woman	1,292,160.00	3.00	The Weeping Woman is an oil on canvas painted by Pablo Picasso in France in 1937. Picasso was intrigued with the subject and revisited the theme numerous times that year. This painting was the final and most elaborate of the series.
4	Phone	Amosu, Call of Diamond	2,180,760.87	4.00	The Call of Diamond smartphone is designed by luxury designer Alexander Amosu. It has an 18 carat gold-plated body, packs over 6 thousand VVS1 diamonds all over, and one big diamond cut into the shape of Apple's logo.
5	Painting	Frida Kahlo, Roots	4,521,598.76	5.00	Painted by world renowned artist Frida Kahlo in 1943, Frida stated her faith that all life can join in a single flow. Roots depicts Frida as her torso opens up like a window and gives birth to a vine. It's her dream of being able to give birth as a childless woman.
6	Island	Tavanipupu, Solomon Islands	6,055,712.62	7.00	Tavanipupu is private resort island in the Solomon Islands. Formerly a coconut plantation, it was transformed into a dreamy island paradise back in the 1970s by a British interior decorator. It is located off the southeast coast of Guadalcanal. The island was visited by Prince William and Catherine in September 2012.
7	Island	Laucala Island, Fiji	8,076,000.00	9.00	Set upon 3,500 exclusive acres, Laucala private island resort is set amidst coconut plantations, sandy beaches, rich green mountains and breath-taking natural beauty. Seamless transition from indoor to outdoor living creates an inspiringly relaxed yet luxurious atmosphere.
8	Phone	Black Diamond	12,354,750.00	11.00	The Black Diamond is designed by Stuart Hughes. The home button is replaced by a single, deeply cut, rare 26 carat black diamond. The back panel is made up of 24 carat gold dressing, studded with 600 white, flawless diamonds. Sapphire glass is set on the screen, and the back logo shows off 53 perfectly cut diamonds.
9	Island	Dark Island, Canada	15,338,700.00	13.00	Dark Island, a prominent feature of the Saint Lawrence Seaway, is located in the lower (eastern) Thousand Islands region, a few yards south of the Canada-United States border. An historic landmark on the island, "The Towers", was long known as "Dark Island Castle" until recently renamed "Singer Castle".

10	Painting	Salvador Dalí, Portrait de Paul Eluard	18,088,000.00	15.00	Painted in 1929, the Portrait de Paul Eluard is a masterpiece of Surrealism and arguably one of the finest Surrealist portraits. Reaching deeply into the psychology of portraiture, it displays many of the most important elements that were key to Dalí's rich visual vocabulary and reflects the untamed imagination and technical virtuosity of Dalí's first mature Surrealist paintings.
11	Residence	Acqua Liana, Florida	18,572,351.65	19.00	Located in Manalapan, Florida, Acqua Liana comprises 1.6 acres of luxury. The massive private dwelling was designed and built according to eight key principles of human and environmental health: location, innovative design, sustainable site development, water savings, energy efficiency, superior indoor air quality, environmentally preferable materials and ease of use. But it was also built with sheer opulence in mind.
12	Painting	Claude Monet, Waterlilly	31,700,000.00	23.00	Water Lilies is a series of approximately 250 oil paintings by French Impressionist Claude Monet (1840–1926). The paintings depict Monet's flower garden at his home in Giverny and were the main focus of Monet's artistic production during the last thirty years of his life.
13	Island	Isla de sa Ferradura, Spain	32,054,905.50	27.00	Isla de sa Ferradura is a private island just off Ibiza, that harmonizes architecture with nature. It is outfitted with only the very best luxury accommodations and appointments for that ultimate tropical paradise. A massive 130,000 square foot hacienda with a number of gorgeous lounges, a home cinema, and even its own Bodega is the scene for a memorable sojourn.
14	Island	Fregate Island, Seychelles	36,342,000.00	31.00	Fregate Island Private is an island in Seychelles. The island is the easternmost of the granitic Inner Islands of the Seychelles. It is 2.07 square kilometres (0.80 square miles). The beach on the island, Anse Victorin, was voted "The World's Best Beach" by The Times.
15	Painting	Pierre Auguste Renoir, Dance at Moulin de la Galette	40,365,000.00	35.00	Bal du moulin de la Galette (commonly known as Dance at Le moulin de la Galette) is an 1876 painting by French artist Pierre-Auguste Renoir. It is housed at the Musée d'Orsay in Paris and is one of Impressionism's most celebrated masterpieces.
16	Painting	Gustav Klimt, Kiss	73,000,000.00	43.00	The Kiss (Lovers) was painted by the Austrian Symbolist painter Gustav Klimt between 1907 and 1908, the highpoint of his "Golden Period", when he painted a number of works in a similar gilded style. It is a symbol of Vienna Jugendstil—Viennese Art Nouveau—and is considered Klimt's most popular work.
17	Phone	Falcon SuperNova	77,125,800.00	51.00	The Supernova is a special edition phone by the US-based luxury brand, Falcon. It uses gemstones and premium materials. It is fitted either with 24 carat gold, rose gold or a platinum case. The entire collection includes 24 choices, each with eight gems mounted on the back.
18	Island	Peter Island, British Virgin Islands	80,000,000.00	59.00	Peter Island is a 720 hectare private island located in the British Virgin Islands. It is about 5 miles south-west from Road Town, Tortola. The island is predominately undeveloped but contains hiking and biking trails. The beaches face the Atlantic Ocean, the Caribbean Sea, and the Sir Francis Drake Channel.
19	Residence	Hearst Castle, California, USA	81,400,000.00	67.00	This Italian style villa was used for iconic scenes in The Godfather, and John F Kennedy stayed here on his honeymoon with Jackie. The former home of newspaper publisher William Randolph Hearst has 27 bedrooms, its own cinema, night club and an outdoor terrace large enough for 400 guests.

20	Residence	Ellison Estate Woodside, California, USA	88,824,290.50	75.00	Ellison Estate consists of a nearly 8,000-square-foot main house with two wings, a guest home, three cottages and a gymnasium as well as a 5-acre man-made lake, two waterfalls and two bridges. Hundreds of mature cherry, maple and other trees were planted among nearly 1,000 redwoods, pines and oaks.
21	Residence	Dracula's (Bran) Castle, Romania	109,011,629.25	91.00	Dracula's Castle is situated near Bran and is a national monument and landmark in Romania. The fortress is situated on the border between Transylvania and Wallachia. It is considered one of the most luxurious castles around the world. It has 57 rooms and around 17 bedrooms with antique furniture.
22	Residence	Seven The Pinnacle, Montana, USA	112,241,603.45	107.00	Seven the Pinnacle is a ski lodge that may be up in the mountains of Montana, but with every floor being heated, you won't feel the cold. It also has an indoor and outdoor pool, its own private ski lift, and spectacular views.
23	Residence	Updown Court, England	121,133,814.00	123.00	Updown Court is a Californian style residence situated in the village of Windlesham in Surrey, England. The 103-room mansion has 58 acres (230,000 square metres) of landscaped gardens and private woodland.
24	Yacht	The Seven Seas	149,350,500.00	139.00	Built by a Dutch company called Oceanco, the Seven Seas yacht can accommodate 12 guests across a series of seven spectacular suites which act as double cabins. There's an opulent owner cabin that has housed its owner, Steven Spielberg. Amenities include a movie theatre, helipad, gymnasium, and an infinity pool.
25	Yacht	The Rising Sun	161,460,000.00	155.00	The Rising Sun is a motor yacht designed by Jon Bannenberg for Larry Ellison, CEO of Oracle Corporation. It has a basketball court on it which can also be used as a helicopter landing pad, a movie theatre, a wine cellar, and a total of 82 rooms scattered across five floors, all filled to the brim with opulence.

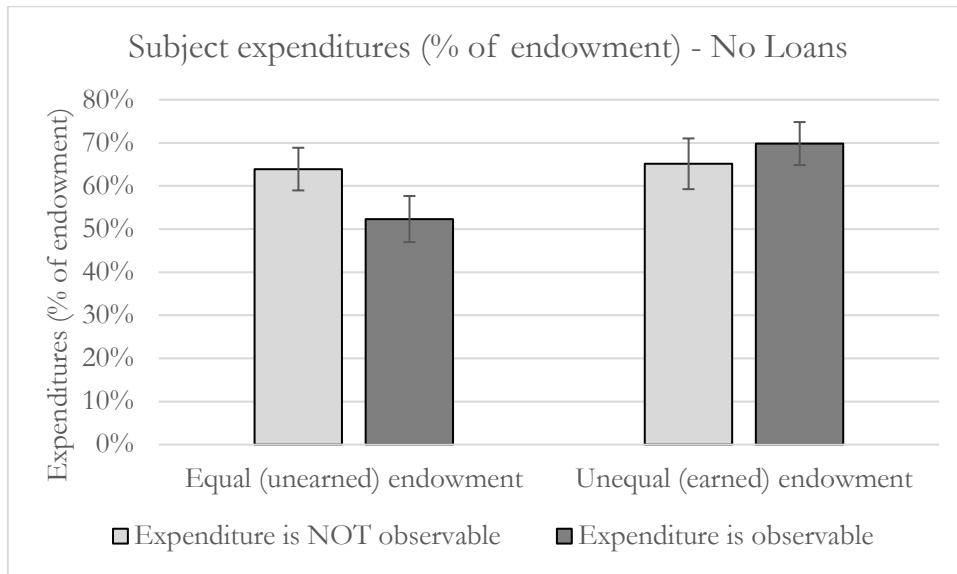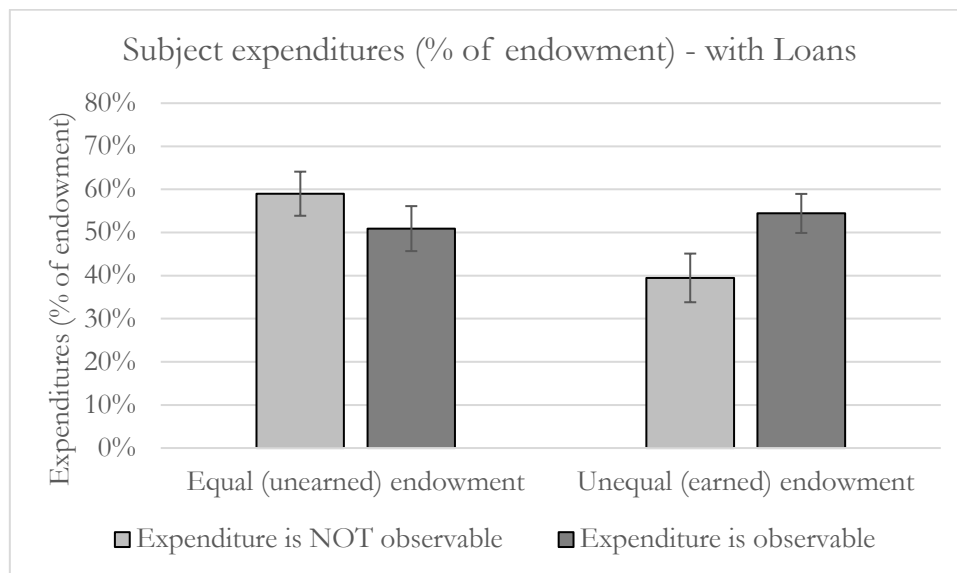**Figure B.1: Subject expenditures per treatment – No Loan treatments**

Figure B.2: Subject expenditures per treatment – Loan treatments