The Effect of Payment Medium on Effort[1]

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Abstract

Employers reward workers and researchers pay human subjects using different payment mediums. These payment mediums can have various psychological effects on workers/research participants, and thereby influence their effort provision. In this paper, we investigate the effect of payment medium on participants' effort in a lab experiment. We find evidence that payment mediums affect participants' productivity when a fixed payment scheme is used, but not under a performance-based payment scheme.

Keywords: payment medium; monetary incentives; social norms; market norms
JEL codes: C91, D91, J33

1 Introduction

In research studies using human subjects, whether it is a survey study, medical research, or a laboratory experiment, it is common to offer incentives to participants (Halpern, 2011; Jenkins et al., 1998; Camerer and Hogarth, 1999; Bonner et al., 2000; Smith and Walker, 1993). These incentives can take a monetary form; for example, cash payments, bank transfers, prepaid debit cards, gift cards and vouchers. Incentives can also take non-monetary forms, including in-kind payments, gifts and grade points in university courses. In economic studies, monetary incentives paid out in cash have traditionally been the preferred and most widespread mechanism to incentivize research participants; cash payments induce the lowest variability in valuation of the incentive among participants, can be paid out anonymously and without delay, and minimise transaction costs and trust concerns. In many cases, however, institutional or funding bodies, and how the study is administered (online rather than physically in the laboratory), prevent the use of cash payments as monetary incentives. As a consequence, cashless monetary payments recently have become widespread, and more so with the increasing use of online experiments, including mTurk and Prolific studies, motivated by reaching a larger and more diverse participant pool. Moreover, experiments conducted with university students have also shifted to online environments since the start of the Covid-19 pandemic. Given the increasing reliance on cashless monetary payments in experiments, it is important to understand the role of the payment medium, specifically the difference between cash and non-cash monetary payments, in decision-making.

Prior studies have examined the influence of monetary versus non-monetary incentives on behavior and peoples' perception of the decision making environment (Bowles and Polanía-Reyes, 2012; Gneezy et al., 2011; Heyman and Ariely, 2004; Kosfeld et al., 2017). Notably Heyman and Ariely (2004) illustrate that monetary incentives provide cues about a "money-market relationship", which cause participants to act according to market norms. In contrast, non-monetary incentives, such as candy, provide cues about a "social-market relationship" which cause participants to act according to social norms (Bowles and Polanía-Reyes, 2012;

Heyman and Ariely, 2004; Bradler and Neckermann, 2019). Studies by Kube et al. (2012), Cao et al. (2020) and Bradler and Neckermann (2019) have shown that a special framing of monetary incentives can influence behavior. Specifically, these studies report that providing the monetary (cash) reward in a gift form increases productivity under a fixed payment scheme, just like non-monetary incentives. These findings demonstrate that a monetary incentive in a form commonly used in gift-giving may cue a social-market relationship, while a monetary incentive of the same value in the form of plain cash may cue a money-market relationship. The common feature in the existing literature is the contrast of monetary incentives given in a gift form and monetary incentives given as plain cash, in a gift-exchange setting.

Using a laboratory experiment, we compare the effect of two different forms of monetary incentive—a plain cash payment and a card payment commonly used for gift-giving in Australia—on performance in an effortful task. The card payment uses a specific type of gift card common in Australia—an EFTPOS gift card. EFTPOS stands for Electronic Funds Transfer at Point of Service which is a homegrown electronic payment system used in Australia. EFTPOS gift cards are commonly used in Australia and require the user to swipe the card and enter the PIN to make a purchase. As opposed to debit and credit cards, EFTPOS gift cards do not have a card number, cardholder name, chip, or the name of international payment networks (such as Visa or Mastercard)—in addition, they commonly display gift designs (e.g. gift box picture). They are widely available and can be purchased online and in a variety of physical stores.[1] In terms of their function and acceptability, EFTPOS gifts cards are similar to cash. First, while they can only be used in physical stores, their use is not restricted to a particular store or chain—they are valid anywhere that accepts EFTPOS. Second, cash and EFTPOS gift cards are highly accepted forms of payment, with 97% and 90% acceptance rates in small and medium-sized enterprises (Doyle et al., 2017). Third, EFTPOS network have low merchant fees compared to Visa and Mastercard debit cards,

[1]EFTPOS gift cards can be purchased in supermarkets, a wide variety of large retail stores, department stores, hardware stores, post offices, etc.

which consequently involves small or no surcharges being passed on to consumers, making it more comparable to cash (Doyle et al., 2017; Stewart et al., 2014). While EFTPOS gift cards and cash have very similar functionalities, the former are marketed as a gift and are commonly used in gift giving; therefore, EFTPOS gift cards have the potential to provide cues about a social-market relationship when used as a monetary incentive.[2]

In our study, we test the influence of the payment medium on behavior under two different payment schemes—cash and gift cards. In study 1, we follow prior studies and compare the effect of the two different forms of payment on effort in a gift-exchange setting. In study 2, we compare the impact of different forms of payment in a performance-based payment setting, which is novel to the economics literature on the behavioral consequences of the payment medium. Our results from study 1 are consistent with prior studies. We find that, under a fixed payment scheme, monetary incentives given as a gift card increase effort compared to cash payments. In study 2, we find that the payment medium does not affect effort in a piece-rate payment scheme. Together, our results suggest that the incentive effect overpowers the psychological effect of the payment medium. More generally, our results provide support that the form of payment may affect research findings using human subjects if the study investigates social preferences in a gift exchange environment, such as the fixed payment scheme. By contrast, if the study offers performance payments, the choice of payment medium is unlikely to influence participant behavior. This provides reassurance for researchers conducting incentivized experiments.

2 Literature

Incentives have complex effects on behavior. The direct price effect of incentives, which encourages the incentivized behaviour, and the psychological effects of the way in which incentives are presented, e.g. monetary versus non-monetary, have been of great interest to

[2]From this point on, we will refer to these cards as gift cards in short.

economists for the last twenty years (Anesi, 2008; Bowles and Polanía-Reyes, 2012; Carpenter and Dolifka, 2017; Erat and Gneezy, 2016; Erkal et al., 2018; Gneezy and Rustichini, 2000; Gneezy et al., 2011; Hammermann and Mohnen, 2014; Heyman and Ariely, 2004; Kajackaite and Gneezy, 2017; Kube et al., 2012; Lacetera and Macis, 2010; Mørkbak et al., 2014). Studies show that people react to the existence and form of incentives, not just the size of incentives. Specifically, incentives may provide cues about the appropriate behavior in the decision-making environment (Bénabou and Tirole, 2006; Bowles and Polanía-Reyes, 2012; Gneezy et al., 2011; Heyman and Ariely, 2004; Bradler and Neckermann, 2019). Heyman and Ariely (2004) argue that the form of the incentive provides cues to participants about whether they are in a social-market relationship or in a money-market relationship. Giving participants non-monetary incentives, such as in-kind gifts, cues a social-market relationship and consequently their effort level is shaped by reciprocity. In contrast, giving participants monetary incentives cues a money-market relationship and leads participants to adjust their effort level to the size of the payment. Heyman and Ariely (2004) also find that mentioning the monetary value of a non-monetary incentive, e.g. price of a gift, is sufficient to turn the relationship that was originally perceived as a social-market relationship into a money-market relationship.

A small literature closely related to our study shows that the framing of monetary incentives, either as a cash payment or as a gift, can influence behavior. Studies show that, under certain conditions, a monetary (cash) payment given in a gift form can be as effective as (non-monetary) in-kind gifts in enhancing reciprocity. In a field experiment conducted in Germany, Kube et al. (2012) test the effect of monetary incentives with and without gift framing on worker effort in a gift-exchange setting. The monetary incentive in a gift form consisted of a bank note folded in an origami shape and presented in a gift envelope. They find that workers who received cash with a gift framing reciprocate with the same level of effort as workers who received an in-kind gift, both of which spend higher effort than workers who received the same amount of cash without the gift framing. In a related field experiment, also conducted in Germany, Bradler and Neckermann (2019) find that folding a

cash gift into a bow or butterfly shape, a common way of presenting cash gifts in Germany, increases productivity. Kube et al. (2012) and Bradler and Neckermann (2019) interpret their findings as the power of a personal touch or thoughtfulness in gift-giving. With a field experiment conducted in China, Cao et al. (2020) compare the effect of unexpected cash payments given to workers as plain cash with bank notes given inside a red envelope, a common practice in giving cash gifts in China. Compared with the previous two studies, Cao et al. (2020) consider cash inside red envelopes as "a weak manipulation of thoughtfulness" as there is no hand-made element or personal effort. In this respect, our study is closest to Cao et al. (2020), as the gift framing used is unlikely to convey thoughtfulness, but is more likely to work through the cue function of a payment medium. Cao et al. (2020) compare the rate of participation and effort level of workers who received an unexpected cash gift with or without a red envelope in a subsequent optional task with a piece-rate structure, a feature that is unique to this literature. In one treatment, they offered an unattractive piece-rate in the optional task, mimicking a situation of a pay-cut in real life. In another treatment, they offered a fair piece-rate payment. They found that, when the cash gift is sufficiently large, the gift framing increases worker effort and willingness to reciprocate the unexpected payment in both unattractive and fair piece-rate conditions. Cao et al. (2020) highlight the powerful role of framing a cash payment as a gift in creating a social-market relationship. Supporting this finding, based on a post-experimental questionnaire, they also found that workers who received the unexpected cash payment in a red envelope were more likely to perceive it as a signal of the employer's appreciation rather than as additional income, compared to workers who received plain cash.

Our study contributes to this literature in two ways. First, we provide additional evidence on the positive effect on effort of giving a monetary payment in a form commonly used in gift-giving compared to giving the same payment in cash. Unlike previous studies, we chose the gift card as the form commonly used in gift-giving in Australia, rather than cash presented in a gift wrap, in origami shape, or in a red envelope. The prevailing use of gift cards for gift-giving in our study population is expected to cue people that they are in a social-market

relationship, just like the prior gift-framed cash payment studies. As we present the monetary payment in a form commonly used for gift-giving, but not in the form of gift-framed cash, our findings are informative for experimental researchers who are constrained to run their experiments with a payment medium other than cash but who do not necessarily want to frame the payment as a gift. Second, we measure the effect of the payment medium on effort levels not only in a gift-exchange environment but also in a piece-rate setting in which the payment is a function of performance. While Cao et al. (2020) offer participants a positive piece-rate in the subsequent task after providing the fixed payment in two different forms, earnings from the piece-rate task are given only in plain cash form. Therefore, their findings do not inform our understanding of the payment medium effect on effort level when the piece-rate payment is made in different forms. In summary, our study fills an important gap in the literature on the effects of giving monetary incentives in different forms on effort.

In addition to our contribution to the economics literature, we complement studies of consumer behavior. There is a large body of literature finding that people have different spending behavior with different forms of payment (Feinberg, 1986; Prelec and Loewenstein, 1998; Prelec and Simester, 2001; Khan et al., 2015). A commonly accepted mechanism driving the effect of the payment medium on spending is the "pain of paying", which is defined as the psychological cost of parting with money (Raghubir and Srivastava, 2008; Soman, 2001, 2003; Thomas et al., 2011). Other studies, such as Reinstein and Riener (2012) and Shen and Takahashi (2013), investigate the effect of the tangibility of money in giving behavior. They test for differences in behavior when cash is physically given to research participants compared to the case of displaying numbers on a screen or paper.[3] Reinstein and Riener (2012) find that people give less when they have cash in hand than when they see numbers on their screen. Shen and Takahashi (2013) find that proposers offer more and responders reject less frequently cash-in-hand condition compared to offers written on paper. Together, these findings indicate that the tangibility of money affects prosocial behavior. Our research question is related to production, complementing studies examining the payment medium

[3]Similarly, Myrseth et al. (2015) examine the tangibility of the payment medium on cooperation.

effect on the consumption side. While many studies focus on the effect of the payment medium on consumer choices, we examine the effect of the payment medium on worker effort. Although our study complements the consumer spending literature, the mechanisms at work in consumption and production are expected to differ. In the consumer behavior literature, studies investigate the payment medium effect generally on a clearly defined exchange environment (e.g. shopping at a store is a clear money-market exchange). Therefore, these studies capture the psychology of spending by keeping the exchange environment constant. On the production side, however, the payment medium is likely to affect the decision-making by manipulating the kind of market the participants perceive themselves to be in, e.g. monetary-market versus social-market, as proposed in Heyman and Ariely (2004) and Bowles and Polanía-Reyes (2012). Specifically, giving a monetary payment in a form commonly used for gift-giving in an inherently money-market exchange setting may evoke non-monetary norms and increase worker reciprocity (Cao et al., 2020).

3 Experimental Design

We design a laboratory experiment to investigate the effect of different forms of payment on effort. Our study design has a number of features to allow for the clean testing of this effect. First, we chose two forms of payment that are very close in terms of their use in everyday transactions, namely cash and gift cards. The gift cards we use are processed through the Australian homegrown electronic payment system called EFTPOS, making these cards widely available and accepted. Both forms of payment can be used in most physical stores and cannot be used for online transactions. There are no consumer fees associated with using the gift cards. Although these gift cards are commonly used in gift giving in Australia, we paid attention not to frame the card as an in-kind gift as we are not interested in measuring the effect of direct gift framing. For this reason, we placed stickers over our cards to hide the picture of a gift box, which could have framed the card as an in-kind gift (see Figure A.3). Thus, if there is any difference in behavior among participants randomly assigned

to the different forms of payment, it cannot be because of the direct framing. The second important feature of our design is that we used a real effort task to measure productivity. Finally, we surveyed participants post-task to learn about their demographic characteristics as well as their everyday payment preferences.

3.1 Real Effort Task

In experimental economics, there are two different methods to measure effort. One is the stated effort and the other is the real-effort task. In the stated effort method, researchers ask participants to choose a number as an effort level, which consequently results in a payoff for the participant. In a real-effort task, participants work on a real task and their payoff depends on their performance in this task. To capture the psychological effects of the payment medium, we chose to use a real-effort task rather than stated-effort (Charness et al., 2018).

We used the slider task created by Gill and Prowse (2012) to measure effort, in the Qualtrics survey platform as in Faravelli et al. (2020). Participants were asked to move sets of 3 sliders to a specified number on a range of integers between 1–200, as shown in Figure A.4. We gave participants 150 sets of slider tasks and displayed them in a random order for each participant in one page. We asked them to complete as many sets as possible in 15 minutes. Participants completed a two-minute practice round prior to the main task to ensure familiarity with the task. The slider task is an effective mechanism to capture effort, as it is unlikely to be affected by pre-existing knowledge or ability compared to other effort tasks (for example, algebra problems). Moreover, the task is easy to communicate, understand and implement.

In the instructions, participants were asked "to correctly complete as many tasks as possible" to clarify what the researcher needs from them. Therefore, participants knew what to do if they wanted to reciprocate.[4] The participants completed the tasks using the Windows

[4]The slider task creates an indirect value for researchers by generating data to work with. It is reasonable to think that participants reciprocate by following the instructions that generate this data although the

operating system, a mouse, and a high-definition screen in a computer. Our pilot sessions informed the number of sets of slider tasks provided and the time allowed to make sure that participants would not exhaust all the tasks. As a result, participants' effort choice was not affected by the design of the task. We presented all questions on one page and allowed the participants to make mistakes without giving them feedback. This allowed us to observe the quality and the quantity of responses as two distinct measures of effort.

Our main outcome variable is the number of correctly completed tasks. We consider two additional variables, the number of mistakes and the average click count, as indicative measures of effort. A participant exerting higher effort in the task is likely to make fewer mistakes (*missed tasks*). One strategy to complete the tasks is to click in a location that is roughly the right one and then click more as needed to fine tune the response. If a lot of participants use this strategy the average click count can provide us with a proxy measure of effort, which is different than the number of tasks completed.

3.2 Survey

After completing the real effort task, participants answered a brief survey, asking them to indicate their age, gender, and field of study. We also asked participants how often they play computer games, because research has shown that experience in playing computer/video games can influence performance in computer-based effort tasks commonly used in research (Murias et al., 2016).[5] Someone who regularly plays computer games could be expected to have better skills in quickly positioning the mouse pointer in a precise location on the computer screen, thus influencing performance in the task. Finally, we collected information about their preferred payment medium for three different price ranges to check whether their preference for a payment medium affected our results.

exact value is not directly observable by participants.

[5]We asked participants to answer the following question "How often do you play computer games?", on a scale from 1 (very often) to 5 (never).

3.3 Timeline of Events and Implementation

Researchers read the instructions aloud to study participants. The instructions were also displayed on participants' screens (See Section B for instructions). After instructions were provided, the payment was left on the participants' desks prior to starting the task. This was intended to make the payment medium more salient and to allow participants to check it if they preferred. Participants then completed two practice tasks and then the 15-minute study task. Once they finished the task, the survey questions appeared on their screen automatically.

4 Fixed Payment Scheme

In Study 1, we gave participants a fixed payment of $20, either as a $20 bank note (Cash treatment) or as a gift card loaded with $20 (Card treatment). We assigned participants to the treatments by sessions. Kube et al. (2012) and Bradler and Neckermann (2019) find an effect size of around .45 when testing the effects of monetary versus non-monetary incentives. We take the effect size in these studies as the basis for our power calculations. To determine a medium size effect (Cohen's d=0.5) with 0.80 power with a significance level of 0.05, we aimed to recruit 64 participants to each treatment (Cohen J., 1992).

4.1 Results

Sixty-two participants took part in the Cash treatment and sixty-one participants took part in the Card treatment. Our sample for Study 1 excludes one participant in the Card treatment group who was classified as an outlier based on the values of two out of the three outcome variables.[6] The exclusion criterion was based on the Grubbs' test (Grubbs, 1969).

[6]The excluded participant was classified as an outlier based on the number of missed tasks (22), and the average click count (9.6); the averages in the full sample are 1.3 and 4, respectively). No outliers were found

Overall, our conclusions excluding this participant are not different from the ones obtained with the full sample.

We start with a brief description of our sample for Study 1. The average age of participants is 23 years, 61 percent are women, and 37 percent are enrolled in a STEM field of study. On average, our participants play computer games with moderate frequency. We report participant characteristics for the Card and the Cash treatment groups separately in Table A.1 in the Appendix. We find no statistically significant differences in participant characteristics across treatments, indicating that the randomization was successful.

Table 1 shows our results. We find that the average number of correctly completed tasks in the Card treatment group is 87.88; this is significantly higher than in the Cash treatment where the average number of completed tasks is 80.68 (p-value is 0.03 in a two-tailed t-test and 0.09 in a Wilcoxon rank-sum test). Participants failed to complete on average 1.27 and 1.16 tasks in Cash and Card conditions respectively. This difference in *MissedTasks* is not statistically significant. The average number of clicks per task was 4.18 in Card treatment, which is slightly higher than 3.88 in the Cash treatment. The small difference between treatments of 0.3 units does not reach statistical significance in a t-test (p-value=0.16), but it does in a Wilcoxon rank-sum test (p-value=0.03).[7]

based on our main outcome variable, the number of correctly completed tasks.

[7]These results are based on our study sample which excludes one outlier. When we include the outlier, the gap between Card vs. Cash in *Tasks* is close to 7 units and statistically significant at the 5% level, the gap in *MissedTaks* is 0.4 and statistically insignificant, and the gap in *ClickCount* is 0.4, statistically significant at the 10% level, all based on a two-tailed t-test.

Table 1: Results for the Fixed Payment Study

	Card mean/sd	Cash mean/sd	Difference
Tasks	87.88	80.68	7.21
	(19.40)	(15.97)	[0.03]
MissedTasks	1.27	1.16	0.11
	(1.49)	(1.36)	[0.68]
ClickCount	4.18	3.88	0.30
	(1.29)	(1.04)	[0.16]
N	60	62	

Notes: p-value of a two-tailed t-test in square brackets.

We explore our results further by examining the outcome variables by gender and computer gamer status. Card compared to Cash treatment positively affects effort for both males and females and the effect is more pronounced for males (see Table A.2 and Table A.3 in the Appendix). We also investigate our results by gamer status. In the post-experiment survey, we asked participants to report how often they play computer games in a 5-point Likert scale from 'never' to 'very often'. We coded anyone with an answer "sometimes", "often", and "very often" as a gamer. We find no difference in effect sizes by gamer status and our results are not driven by gamers (See Table A.4 in the Appendix).

Experimental results support the idea that the payment medium gives cues about the appropriate behavior in the decision-making environment. Specifically, gift cards cue participants for a social exchange. Participants in the Card treatment are more likely to reciprocate as a result of this cue, confirming the findings in Cao et al. (2020). Note that we ran our experiment in a gift exchange environment following the previous payment medium effect studies, in which we expect the direct price effect to be negligible or non-existent.[8] When the

[8]According to standard economic theory, the direct price effect should not exist —participants should

direct price effect is negligible, the psychological effect of the payment type is expected to play a major role. However, in an environment in which a direct price effect is also expected to be important, we are less likely to observe this psychological effect (e.g. the direct price effect overpowering the psychological effect). To investigate this further, we ran another experiment in which the participants are paid using a piece-rate mechanism.

5 Piece-rate Payment Scheme

In Study 2, we ran the same experiment with a piece-rate reward rather than a fixed reward. We told participants that they will earn 10 cents for each correctly completed task in addition to their show-up payment of $10, and that their earnings will be rounded up to the nearest dollar. As before, we implemented two treatments, Card and Cash. The task and duration of the task were also the same. We gave the show-up payments *before* the start of the task to make the payment medium salient and to make this experiment comparable to the first experiment. We then paid participants' additional earnings at the end of the session based on the number of tasks correctly completed. In the Cash treatment, we gave each participant a $10 bank note, the show-up fee, before they started the task. After they completed the task, we gave them their additional earnings in cash. In the Card treatment, we gave each participant a card loaded with $10. After they complete the task, we gave them their total earnings together, show-up payment and additional earnings, loaded in one card in exchange of the initially given card with $10. This was to minimize inconvenience of having multiple cards. Participants were informed of this procedure beforehand (see the appendix for the instructions).

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not exert any effort.

5.1 Results

In Study 2, 58 participants took part in the Card treatment and 60 participants took part in the Cash treatment. Participants in the piece-rate payment study have similar characteristics to those in the fixed payment study. Their average age is 23 years, 58 percent are women, 47 percent are enrolled in a STEM field of study, and the average frequency of playing computer games is moderate. Importantly, as shown in Table A.5 in the Appendix, these characteristics are not statistically different across the Card and Cash treatment groups.

We report the results of this study in Table 2. We find that the average number of correctly completed tasks in the Card treatment is slightly lower than in the Cash treatment, but the gap is not statistically significant (p-value is 0.63 in a two-tailed t-test and 0.62 in a Wilcoxon rank-sum test). The number of missed tasks is slightly lower in the Card treatment, but the difference is weakly significant only in the two tailed t-test and the Wilcoxon rank-sum test ($p = 0.09$). The difference in the average click count is very small and statistically insignificant (p-value is 0.67 in a two-tailed t-test and 0.28 in a Wilcoxon rank-sum test).

Table 2: Results for the Piece-rate Payment Study

	Card	Cash	Difference
	mean/sd	mean/sd	
Tasks	80.41	81.77	-1.35
	(15.65)	(14.41)	[0.63]
MissedTasks	1.03	1.48	-0.45
	(1.30)	(1.52)	[0.09]
ClickCount	3.92	3.98	-0.06
	(0.85)	(0.75)	[0.67]
N	58	60	

Notes: p-value of a two-tailed t-test in square brackets.

We report the results from the two studies together in the Appendix to enable comparison (Table A.6). Mean task completion in the Card treatment in the fixed payment study exceeds the one in the Card treatment in the piece-rate study by about 7 units (p-value is 0.02 in a two-tailed t-test and 0.05 in a Wilcoxon rank-sum test). In contrast, the difference in mean task completion in the Cash treatment across the two studies is only 1 unit and statistically insignificant. The observation that participants in the Card treatment in the fixed payment study exert significantly more effort than all other groups is also evident in Figure A.1, showing the mean task completion by study and treatment.

6 Potential Mechanisms

Our results are consistent with the psychological effect created by the payment medium. Specifically, monetary incentives given in the form of a gift card provide cues for a social exchange and motivate participants to reciprocate. Below, we investigate other possible mechanisms.

6.1 Preferred Payment Medium

One possible explanation for the participants to be more productive in the card condition than in the cash condition is the preference for card payment over cash. However, this is unlikely for several reasons. First, we asked participants about their preferred payment medium for different ranges of spending and there was no difference in the preferred payment medium by treatment (see Figure A.2). Second, if the receipt of a less preferred payment medium lead to a decrease in effort in the cash treatment in fix payment study, then we would also observe the same effect in the Piece-rate study, which is not the case. Third, we also asked participants in the piece-rate study about their preferred payment medium should they be given the option to choose their payment medium in the experiment. The majority

of participants in both treatments preferred cash. [9]

6.2 Trust

In experimental economics, participants' trust in the experimenter is critical for the validity of the results (Bonetti, 1998). In our experiment, for example, participants' behavior in the two treatments may be asymmetrically affected if they do not trust the researcher. The Cash and Card treatments do not only differ in terms of payment medium and the cues provided by the forms of payment, but also in terms of verifiability of the amount paid. For cash payments, participants can immediately verify the amount paid —the same cannot be said for card payments. If participants do not believe the experimenter and they do not believe there is $20 on the card, this may cause a difference in behavior. We argue that the issue of trust does not affect our experiment. First, we recruited our participants from a participant pool which is used only for experiments without deception (i.e. the subjects have built trust with researchers). Second, the effect of trust is expected to go against the effect we found. Specifically, a participant who believes they will not be paid $20 in the card condition would be less motivated to provide effort. Therefore, it is unlikely for trust to drive our results.

6.3 Novelty Effect

When people are exposed to a new system or a new environment, a temporary short-term boost in performance may be observed due to the novelty of this new environment rather than the genuine effect of it (Wells et al., 2010). In psychology, this is called a "novelty effect". If the participants are unfamiliar with a gift card, the novelty effect may lead to an increase in the effort level. We think that this is unlikely. First, gift cards are very commonly used in gift-giving in Australia. They can be purchased in a wide range of physical stores

[9] In the Card treatment the share of participants preferring cash (card) was 43/58 (3/58). Similarly, the share preferring cash (card) was 42/60 (5/60) in the Cash treatment.

and online, and the merchant acceptance rate is 90%. Second, even if some participants find the gift card as something new and novel, the novelty effect would be observed in the way they interact with this payment medium, which is not what we observe. Therefore, the novelty effect cannot explain our results.

7 Discussion and Conclusion

We test the effect of two different forms of payment mediums, cash and gift card, on participant effort in laboratory experiments under fixed payment and piece-rate payment schemes. Under the fixed payment scheme, we found that participants paid with the gift card exert significantly more effort than those paid with cash. Our findings are consistent with the idea that incentives provide cues about the decision-making environment (Heyman and Ariely, 2004; Gneezy et al., 2011; Bowles and Polanía-Reyes, 2012). Even though we lack direct evidence on the channels for the effects of the different forms of payment on behavior, our results are best explained by the fact that the payment medium commonly used in gift giving can cue participants for a social-market relationship and make them wish to pay back the "gift"with a higher level of effort, as demonstrated by Cao et al. (2020). Cash, on the other hand, cues participants towards a money-market relationship. Consequently, they act according to the standards of market exchange and are less motivated to reciprocate the payment. In contrast, under the piece-rate payment scheme, we found no difference in productivity by payment medium. This is because the direct price effect overcomes the psychological effect (Fehr and Gächter, 2000; Cao et al., 2020). Consistent with the literature, our results show that the payment medium may affect participant behavior when the payment is not performance-based, as in the gift-exchange environment. Our results also highlight that the influence of the payment medium on behavior is not generalisable to all settings. Specifically, the payment medium is unlikely to influence participant behavior when the payment is performance-based. This is an important and reassuring finding for experimental researchers in behavioral sciences.

Our study makes a contribution to our understanding of the effects of the payment medium on participant effort not only in a fixed payment setting but also in an incentive setting. More research is needed to understand the effects of different forms of payment and to answer related questions that we cannot address in this study. Some of these questions are: (1) how different forms of payment cue the decision-making environment, (2) whether different forms of payment cue distinct cohorts of people differently, and (3) whether the effects we find in our controlled laboratory setting remain if participants interact with each other strategically. Last, the insights gained from our laboratory study can possibly open discussions about the effect of different forms of payment on people's behavior in everyday life.[10]

[10]For example, the effect of payment medium on productivity of employees, on blood donation behavior Lacetera and Macis (2010), on job search behavior of unemployment benefit recipients.

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A Appendix

Table A.1: Summary Statistics for the Fixed Payment Study

	Card mean/sd	Cash mean/sd	Difference
Age	22.87	23.69	-0.82
	(5.48)	(6.66)	[0.46]
Female	0.55	0.67	-0.12
	(0.50)	(0.48)	[0.19]
STEM	0.42	0.32	0.09
	(0.50)	(0.47)	[0.29]
Games	2.45	2.27	0.18
	(1.16)	(1.04)	[0.38]
N	60	62	122

Notes: p-value of a two-tailed t-test in square brackets. F-test of joint significance yields a p-value of 0.65.

Table A.2: Results for the Fixed Payment Study by Gender

	Female			Male		
	Card	Cash	Difference	Card	Cash	Difference
	mean/sd	mean/sd		mean/sd	mean/sd	
Tasks	84.82	80.5	4.31	91.63	83	8.63
	(16.51)	(15.55)	[0.25]	(22.19)	(16.57)	[0.15]
MissedTasks	1.27	1.08	0.20	1.26	1.25	0.01
	(1.81)	(1.33)	[0.59]	(1.02)	(1.45)	[0.98]
ClickCount	4.19	3.86	0.33	4.16	3.97	0.20
	(1.26)	(1.06)	[0.23]	(1.36)	(1.08)	[0.60]
N	33	40	73	27	20	47

Notes: p-value of a two-tailed t-test in square brackets.

Table A.3: Tasks on Payment Medium controlling for gender in the Fixed Payment Study

	Tasks		
	(1)	(2)	(3)
Card	7.206*	6.851*	10.630*
	(3.213)	(3.224)	(5.091)
Female		-3.727	-0.500
		(3.288)	(4.705)
Card*Female			-6.311
			(6.580)
Constant	80.677**	83.082**	81**
	(2.253)	(3.093)	(3.779)
Observations	122	122	122

$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Table A.4: Results for the Fixed Payment Study by Gaming Habits

	Gamer			Non-Gamer		
	Card	Cash	Difference	Card	Cash	Difference
	mean/sd	mean/sd		mean/sd	mean/sd	
Tasks	88.64	80.70	7.94	87.34	80.67	6.68
	(20.33)	(15.59)	[0.14]	(18.99)	(16.39)	[0.11]
MissedTasks	1.44	1.13	0.31	1.14	1.18	-0.04
	(1.00)	(1.36)	[0.37]	(1.77)	(1.37)	[0.92]
ClickCount	4.38	3.72	0.66	4.03	3.97	0.06
	(1.58)	(0.90)	[0.08]	(1.05)	(1.12)	[0.81]
N	25	23	48	35	39	74

Notes: p-value of a two-tailed t-test in square brackets.

Table A.5: Summary Statistics for the Piece-rate Payment Study

	Card mean/sd	Cash mean/sd	Difference
Age	22.95	22.33	0.62
	(3.36)	(3.77)	[0.35]
Female	0.60	0.57	0.04
	(0.49)	(0.50)	[0.69]
STEM	0.45	0.50	-0.05
	(0.50)	(0.50)	[0.58]
Games	2.95	2.68	0.26
	(1.26)	(1.23)	[0.25]
N	58	60	118

Notes: p-value of a two-tailed t-test in square brackets. F-test of joint significance yields a p-value of 0.42.

Table A.6: Results for both Studies

	Card			Cash		
	Fixed mean/sd	Piece rate mean/sd	Difference	Fixed mean/sd	Piece-rate mean/sd	Difference
Tasks	87.88	80.41	7.47	80.68	81.77	-1.09
	(19.40)	(15.65)	[0.02]	(15.97)	(14.41)	[0.69]
MissTasks	1.27	1.03	0.23	1.16	1.48	-0.32
	(1.49)	(1.30)	[0.37]	(1.36)	(1.52)	[0.22]
ClickCount	4.18	3.92	0.26	3.88	3.98	-0.10
	(0.17)	(0.85)	[0.20]	(1.04)	(0.75)	[0.53]
N	60	58	118	62	60	122

Notes: p-value of a two-tailed t-test in square brackets.

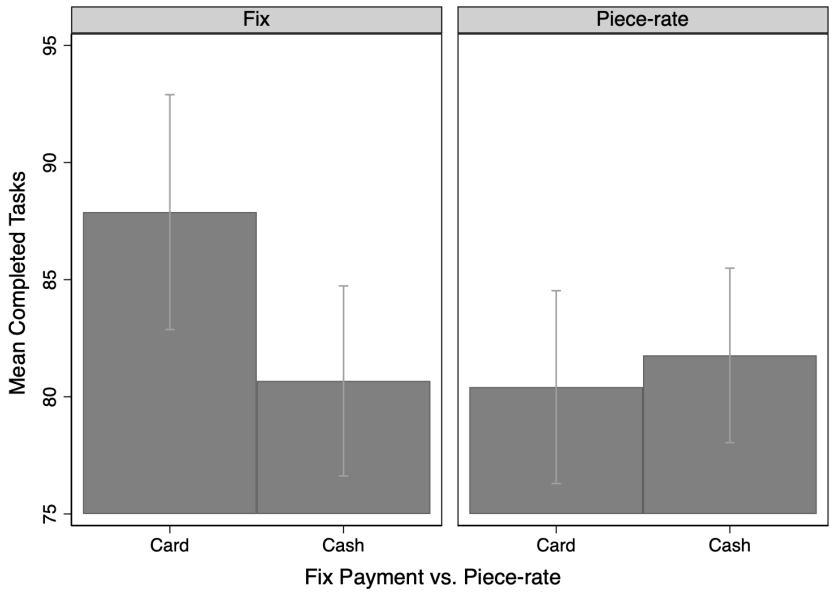

Figure A.1: Correctly Completed Tasks Bar Graph with Confidence Intervals

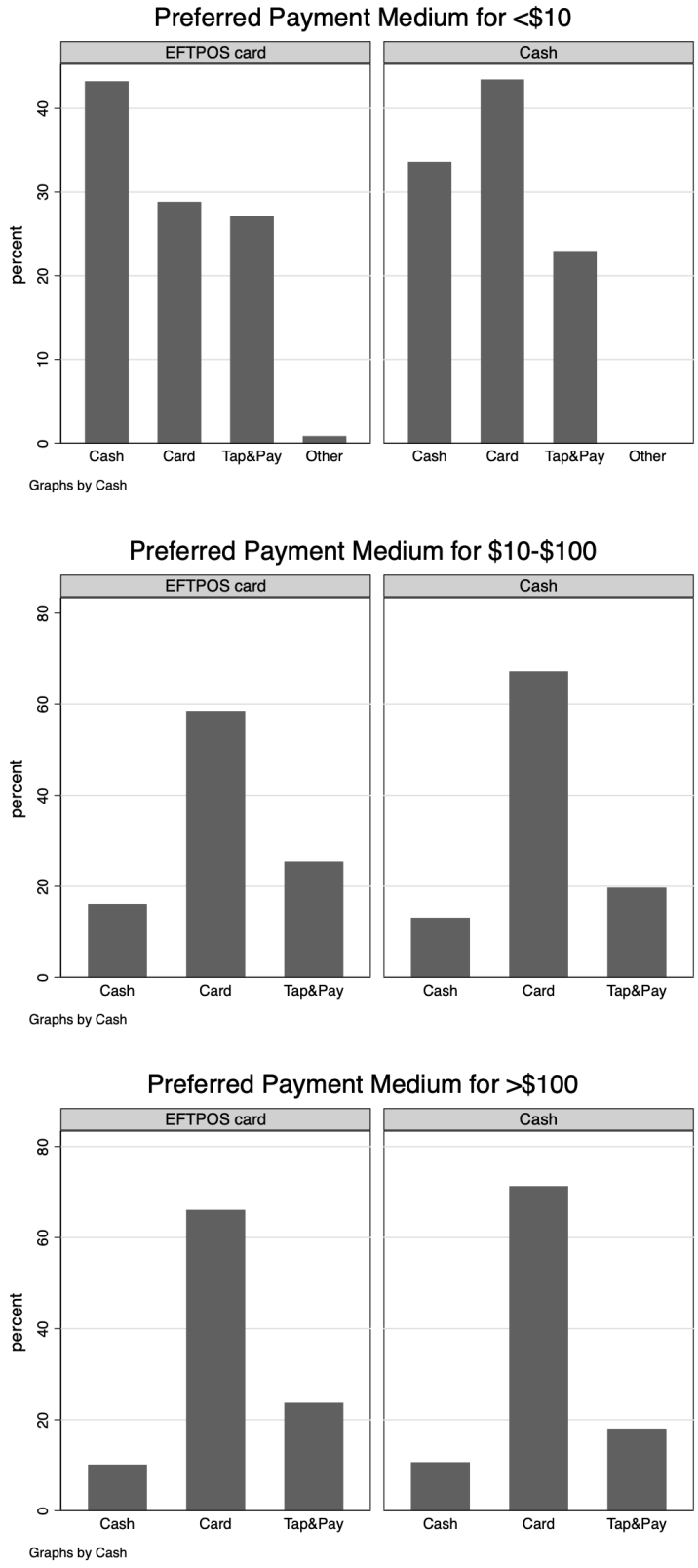

Figure A.2: Preferred Payment Medium

Figure A.3: A Sample Eftpos Card

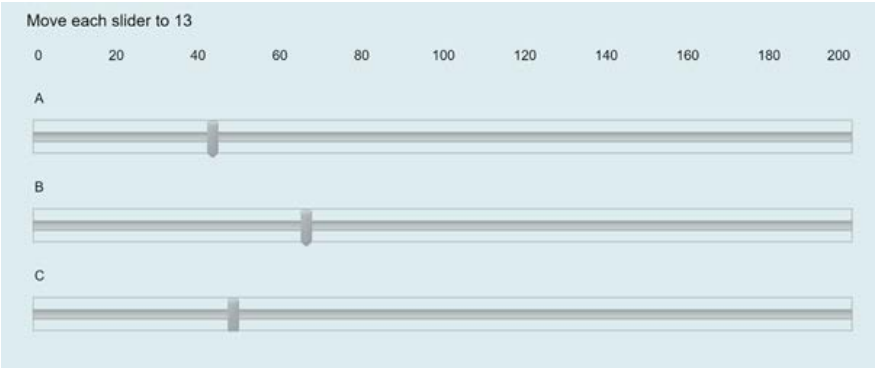

Figure A.4: Slider Task

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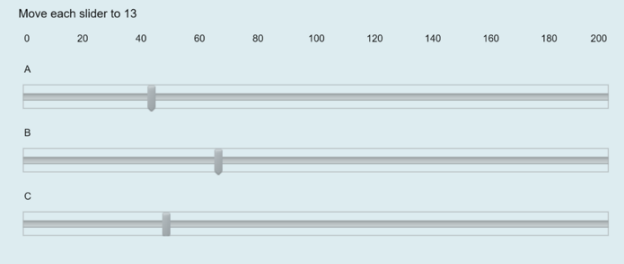
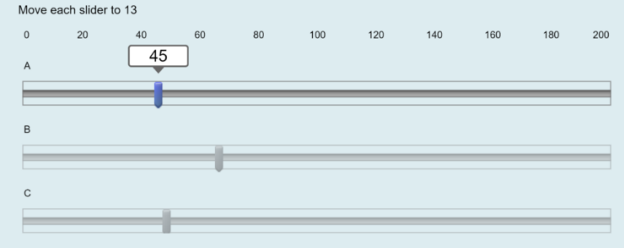
B Supplementary Information

INSTRUCTIONS (For fix payment study)

Thank you for participating in this experiment. The instructions are as follow: In this experiment, you will be asked to correctly complete as many tasks as possible. Each task will require you to move a set of sliders to a given number. An example task is given below.



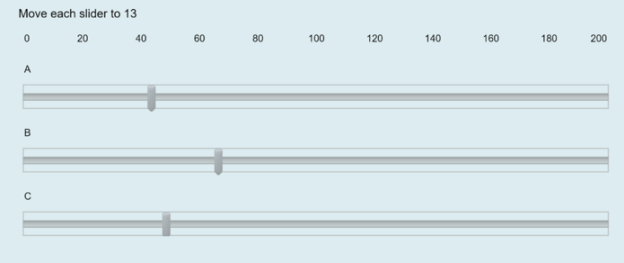
In this example task, you are being asked to move the three sliders to the number 13. At the beginning, the sliders are randomly set anywhere between 0-200. Once you start to move the slider, the exact number will appear as shown below.



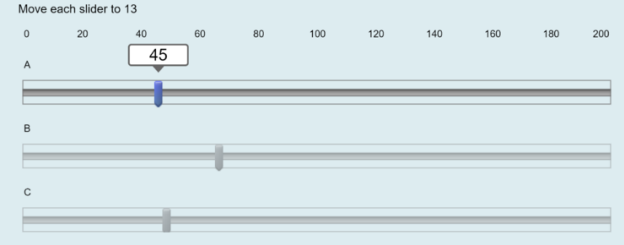
In the next screen, you will see two practice tasks. You will have 2 minutes to complete these practice tasks. You will then wait for the experimenter to prompt you to start the real task which will take 15 minutes to complete. You will be paid $20 in the form of cash (an EFTPOS card) for this task. Do not speak to any other participants at any time during this experiment. If you have any questions, please raise your hand now. An experimenter will come to your seat and assist you.

INSTRUCTIONS (For piece-rate study)

Thank you for participating in this experiment. The instructions are as follow: In this experiment, you will be asked to correctly complete as many tasks as possible. Each task will require you to move a set of sliders to a given number. An example task is given below.



In this example task, you are being asked to move the three sliders to the number 13. At the beginning, the sliders are randomly set anywhere between 0-200. Once you start to move the slider, the exact number will appear as shown below.



In the next screen, you will see two practice tasks. You will have 2 minutes to complete these practice tasks. You will then wait for the experimenter to prompt you to start the real task which will take 15 minutes to complete. You will be paid $10 as a show up fee and 10 cents for each correctly completed task. Your total earnings will be rounded up to the nearest dollar figure.

Card Treatment version: Your payment will be in the form of EFTPOS card. The experimenter will now come by your desk to hand out your $10 show-up fee. You will receive your total earnings from the experiment (including your show-up fee) at the end of the

session. This is how it will work: the experimenter will give you an EFTPOS card with your total earnings in exchange of your initial EFTPOS card with $10.

Cash Treatment version: Your payment will be in the form of cash. The experimenter will now come by your desk to hand out your $10 show-up fee. You will receive your earnings from the experiment (in addition to your show-up fee) at the end of the session.

Do not speak to any other participants at any time during this experiment. If you have any questions, please raise your hand now. The experimenter will come to your seat and assist you.