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***'The Effect of Payment Medium
on Effort'***

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The Effect of Payment Medium on Effort

Abstract

There are a number of payment mediums that are used to pay participants in Economics lab experiments, with cash payments being common practice. However, institutional barriers or funding constraints may prevent researchers using this conventional payment medium. Alternative payment mediums may have different psychological effects on participants, and thereby change the behaviour in the lab. In this paper, we investigate the effect of using different payment mediums on participants. We find that different payment mediums affect participants' effort when a fixed payment scheme is used, but does not influence effort when a performance-based scheme is used.

Keywords: payment medium; monetary incentives; social norms; market norms

1 Introduction

In economics lab experiments, paying participants in cash at the completion of the experiment is common practice. In some cases, however, it is not feasible or desirable to run lab experiments using cash payments. For example, some institutions and funders may require researchers to use traceable methods for transparency and safety. Moreover, some experiments may be more suitable to run with an electronic payment medium, providing an opportunity to pay subjects at specifically set dates (e.g. time preference experiments).

How participants of lab experiments are paid is an important and frequently discussed topic among experimental economists.¹ If the payment medium affects the participants behaviour, the same experimental design implemented with two different payment mediums may result in different effect sizes. As the researchers are expected to compare their results with prior studies, this difference might be hard to reconcile without a knowledge about the effect of payment mediums. It is also important to know the role of payment mediums on participants' behaviour for the external validity of lab experiments. If lab results are susceptible to payment mediums, then researchers may want to use payment mediums close to the ones used in real life to increase the external validity.

In this paper, we ask whether the payment medium affects participants' behaviour in the lab. It is well-known from the literature that monetary incentives have complex effects on behaviour (Bowles and Polanía-Reyes [2012], Gneezy et al. [2011], Heyman and Ariely [2004]). For example, monetary incentives may provide cues about the “market norms”, and consequently cause participants to act according to those norms; in contrast, non-monetary incentives, such as candy, may provide cues about “social norms”, and consequently cause participants to act according to those norms (Bowles and Polanía-Reyes [2012], Heyman and Ariely [2004]). Since payment mediums are vehicles for giving monetary incentives,

¹For example, in the online discussion forum of the Economic Science Association, which is one of the well-known professional organizations to advance the field of experimental economics, there was a recent discussion in May 2019 about the acceptability of payment mediums other than cash in lab experiments.

the complex effects of monetary incentives may interact with the payment medium and influence participant behaviour. For example, a monetary incentive in a form similar to a gift card may cue social exchange norms, while the same value monetary incentive in the form of cash may cue market exchange norms. In this paper, rather than comparing a monetary incentive to non-monetary incentive, we compare the effect of giving the same value incentive in two different forms –one as cash and the other as an EFTPOS card. EFTPOS stands for Electronic Funds Transfer at Point of Service and these cards are similar to debit cards in terms of their use.² However, in terms of the physical appearance, they look more like gift cards as they do not have card number, cardholder name, chips, or the names of international payment networks, such as VISA or MasterCard on them. To the best of our knowledge, no prior studies compared the forms of monetary incentives, while there have been studies comparing monetary and non-monetary incentives (Heyman and Ariely [2004], Kube et al. [2012], Bradler and Neckermann [2019]). Comparing the effect of different payment mediums, in addition to well-studied comparison of monetary versus non-monetary payments, is necessary since it is more common to provide monetary incentives in different forms than providing non-monetary incentives in economics experiments and in labour market.³

To investigate this effect, we focus on two payment mediums, cash and card. We then study the impact of payment mediums on one type of behaviour, productivity, and on two types of payment schemes, fixed payment and piece-rate payment. We specifically choose these two payment mediums as they are the most comparable types for our purpose. We investigate the effect of these payment mediums in fixed and piece-rate payment environments, because it is more likely to observe the psychological effect in the former than the latter (Heyman and

²EFTPOS cards are a home grown system in Australia whereas debit cards use international credit card payment networks. As a result, these cards are accepted only in Australia as opposed to debit cards that are accepted in many parts of the world. For brevity, we will call the latter as just “card”.

³In addition to cash, gift cards and vouchers are some of the common methods of paying subjects in economics experiments. Holiday bonuses can be a good example in the real labor market. It is common for people to give gift cards or cash, e.g. to nannies or house helpers, rather than actual gifts as holiday bonuses.

Ariely [2004], Fehr and Gächter [2011]). The strong direct price effect of incentives in the piece-rate payment scheme may cancel out the psychological effect in the opposite direction.

In our experimental results, we find that participants spend more effort when they are paid with cards compared to cash in the fixed payment scheme. In contrast, there is no difference in effort by payment medium in the piece-rate payment scheme. Our results are consistent with the previous literature; they find that people work harder when they are given non-monetary incentives in a fixed payment scheme environment as they act according to social norms and reciprocate (Kube et al. [2012], Heyman and Ariely [2004]). In our case, we find people work less when they are paid in cash compared to when they are paid the same amount of monetary incentive in a form which is more associated with social exchange.

Our results imply that the form of payment may affect the results of economics lab experiments; researchers need to choose and identify the payment medium carefully if the study investigates social preferences in a gift exchange environment, such as the fixed payment scheme. If the target study gives performance payments, such as the piece-rate payment scheme, the choice of payment medium is not crucial.

The paper is organized as follows. In Section II, we review the related literature. We introduce the experimental design in Section III and report the results of the fixed payment experiment in Section IV. In Section V, we report the results of the piece-rate payment scheme. In Section VI, we discuss possible mechanisms behind our results and in Section VII we conclude.

2 Background and Literature

In experimental economics, it is common practice to pay subjects in cash. The substitutability of another payment medium in place of cash largely depends on whether alternative payment mediums may affect participants' decision-making. To the best of our knowledge, no

prior research investigates specifically these effects, although the effect of monetary and non-monetary incentives has been a great interest for economists for the last 20 years (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], Mørkbak et al. [2014]).

We know from the literature that incentives have complex effects on behaviour. In addition to the direct price effect of incentives making the incentivised behaviour more attractive, the psychological effects of incentives are well explored especially in the domain of social preferences (Anesi [2008], Bowles and Polanía-Reyes [2012], Gneezy and Rustichini [2000], Gneezy et al. [2011], ?). One argument in this literature is that people are likely to react to the existence of incentives, in addition to the size of incentives. For example, incentives may provide cues about the appropriate behaviour in the decision-making environment, or about the nature of the task (Bénabou and Tirole [2006], Bowles and Polanía-Reyes [2012], Gneezy et al. [2011], Heyman and Ariely [2004]). Specifically, giving people non-monetary incentives may cue participants that they are in a social exchange and consequently cause them to act according to social norms; in contrast, giving people monetary incentives may cue participants that they are in a monetary exchange and consequently cause them to act according to market norms. Previous research finds that people may be more productive when they are paid with non-monetary incentives or with incentives strongly framed as “gifts” compared to the same size monetary incentives (Kube et al. [2012], Heyman and Ariely [2004]).⁴ This literature suggests that similar psychological effects may also be created by the form the monetary incentives take.

While the effect of payment mediums on productivity of lab participants or on workers has not been investigated before, there is a large body of literature demonstrating the effect of payment mediums on spending (Feinberg [1986], Prelec and Loewenstein [1998], Prelec and Simester [2001], Khan et al. [2015]). This literature finds that people have different spending

⁴DellaVigna et al. [2016] find a contrasting evidence.

behaviour with different payment mediums. A commonly accepted mechanism driving the effect of payment mediums on spending is the “pain of paying”, which is defined as the psychological cost of parting with money. This effect has been shown to be different with different payment mediums (Raghubir and Srivastava [2008], Soman [2001, 2003], Thomas et al. [2011]). Although our research question in the production side of the economy seems like a mirror image of this well explored research question in the consumption side, the mechanisms driving the effect of payment medium are expected to be quite different from each other. On the consumption side, studies investigate the payment medium effect on a clearly defined exchange environment. Therefore, these studies capture the psychology of spending by keeping the exchange environment constant.⁵ On the production side, however, the payment medium affects the decision-making by manipulating the norms of exchange. Reinstein and Riener [2012] and Shen and Takahashi [2013] study the psychology of a specific spending, which is the giving behaviour. They test the effect of physically giving cash to lab participants to spend on donations, compared to numbers on screen or tokens.⁶ They find that the tangibility of the payment medium affects the giving behaviour. In these studies, the tangibility effect is not entirely distinguished from the cue providing effect of payment medium. It is possible for the payment medium to affect participants’ behaviour even when the “tangibility” channel is turned off. In our experiment, we investigate the cue providing effect of payment medium as both payment mediums are tangible.

3 Experimental Design

We design a lab experiment to investigate the effect of payment medium on effort provision. Our design has a number of features to allow clean testing of this effect. First, we use two payment mediums that are very close in terms of their use in everyday transac-

⁵In spending, consumers decide whether to exchange one good for another, in which one of the exchanged goods is money in different forms.

⁶Similarly, Myrseth et al. [2015] examine the tangibility of payment medium on cooperation.

tions, namely cash and EFTPOS card which is a payment system in Australia. Second, we give our participants a real effort task to measure the effort provision. Third, we make the payment medium salient by paying the participants before the effort task. Fourth, we survey participants post-task to learn about demographics as well as their everyday payment preferences.

3.1 Two Comparable Payment Mediums

We chose cash and EFTPOS cards to study the effect of payment medium on effort. EFTPOS stands for Electronic Funds Transfer at Point of Service; the money stored on them can either be prepaid or come from a current bank account. Despite being similar to debit cards in terms of how value is stored in them, they look more like gift cards in terms of the physical appearance as they do not have card number, cardholder name, chips, or the names of international payment networks, such as VISA or MasterCard on them.

These two payment mediums are very similar in terms of their use. First, both payment mediums can only be used in physical stores. Secondly, cash and cards are two highly accepted payment mediums, with 97% and 90% acceptance rates in micro, small and medium-sized enterprises (Doyle et al. [2017]).⁷ Third, these cards have lower merchant fees than other MasterCard and Visa debit cards, which consequently involves smaller surcharges being passed on to consumers, making it more comparable to cash (Doyle et al. [2017], Stewart et al. [2014]).

3.2 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

⁷For brevity, we call EFTPOS cards as cards from this point on.

ask participants to choose a number as an effort level, which consequently results in a payoff for the participant according to the effort function chosen by researchers. In a real-effort task, on the other hand, the participants actually work on a task and their payoff depend on their performance on this task (e.g. typing some letters, counting grids). To capture the psychological effects of payment medium, we chose to use a real effort task rather than stated-effort (Charness et al. [2018]). Specifically, in a stated-effort in comparison to real-effort it may be harder to justify a low effort, which can suppress any impact that a payment medium may have on effort. In the case of real-effort task, low effort cannot solely be attributed to participants' deliberate choice of low effort but to other possible factors (e.g. some people are just slower than others in typing), which is not the case for the stated-effort tasks.

We used the slider task of Gill and Prowse [2012] to measure effort. Participants had to move sets of 3 sliders to a given number on a range of integers between 1-200, as shown in Figure 6. We gave participants 150 sets of slider tasks and displayed them in a random order for each participant. We asked them to complete as many sets as possible in the allocated time period of 15 minutes. We provided participants with a two-minute practice task prior to the actual experiment to ensure familiarity with the task. The slider task is an effective mechanism to capture effort, as it is not affected by preexisting knowledge or ability. Moreover, it is easy to communicate, understand and implement. The participants completed the tasks using Windows OS, a mouse and a high definition screen. Our pilot sessions informed the number of sets of slider tasks provided and the time to give participants so that the participants would not be able to complete all the questions in an allocated timeframe, given the specific device characteristics that they would be working with. As a result, participants' effort choice was not impacted by the design of the task. Following Faravelli et al. [2017], we ran the experiment on the Qualtrics survey platform. Unlike Faravelli et al. [2017], however, we presented all questions on one page and allowed the participants to make mistakes. This allowed us to observe the quality and the quantity as two measures of effort.

3.3 Survey

After working on the real-effort task for 15 minutes, participants were asked a number of questions in a post-task online survey. First, we collected information about their age, gender, and field of study. Second, we asked participants how often they play video games, as there is a slight risk that this may affect their performance in our task. Third, we collected information about their everyday preferred payment medium for three different price ranges to check whether their preference for a payment medium affected our results.

3.4 Timeline of Events and Implementation

Researchers read the instructions, which were also displayed on participants' screen, aloud. After the instructions, we left the payment on the participants' desks. We made payments before participants started the task to make the payment medium more salient and to allow them to check it if they prefer. After payment distribution, participants completed two practice tasks. When everyone finished the practice task, participants started the 15 minute real task. When they finishes it, survey questions appeared on participants' screen automatically.

4 Fixed Payment Scheme

In our first study, we gave participants a fixed payment of \$20, either as a \$20 bill or as a card loaded with \$20. We assigned the treatment by sessions and randomized the order of sessions. Unlike other gift exchange experiments run previously, we paid attention not to frame the card as a gift card as we are not interested in the effect of direct framing. We placed stickers over our prepaid Eftpos cards to hide any positive language or images on the cards, which may have framed the card as a gift (see Figure 5). As a result, if there is any difference in effort between cash and card conditions, it cannot be because of the direct

framing.

Our data includes 62 observations in the control and 61 in the treatment.⁸

4.1 Results

We show the summary statistics for demographic information gathered from the post-experiment survey for all participants and by treatment group in Table 1. In addition to *Age* and *Gender*, we created a variable to measure the frequency of computer games played. The variable *Games* represents the answers to a 5-point Likert scale question “How often do you play computer games?” with a higher number representing a higher frequency. The dummy variable *STEM* denotes a Science, Technology, Engineering, or Math majors. We observe that both groups are closely matched in terms of age, gender, frequency of computer games participants play, and study field. Although there are more females in the treatment group, the difference is not statistically significant. Table 1 shows that the randomisation was successful and the two groups are reasonably comparable.

There are three outcome variables that we can measure. The number of correctly completed tasks, the number of mistakes, and the number of click counts. Our main measure of interest is the number of correctly completed tasks. The other two measures are indicative if the participant wants to be seen as exerting effort by clicking without caring much about the “quality” of the work produced. Table 2 shows our results. We find that the correctly completed tasks in the Cash condition is significantly less than in the Card condition (80.68 versus 87.33, $p=0.04$ in a two-tailed test). The average number of tasks that are incorrectly completed are in between one and two in both conditions, and consequently is not informative. ClickCount refers to the number of clicks that participants made throughout the task duration. A participant can use different strategies to complete a slider task. One strategy

⁸In order 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 in each condition (Cohen J. [1992]).

	Cash	Card	All
	mean/sd	mean/sd	mean/sd
Age	23.69 (6.66)	22.80 (5.45)	23.25 (6.08)
Female	0.65 (0.48)	0.54 (0.50)	0.59 (0.49)
Games	2.27 (1.04)	2.46 (1.15)	2.37 (1.10)
STEM	0.32 (0.47)	0.41 (0.50)	0.37 (0.48)
<i>N</i>	62	61	123

Table 1: Summary Statistics for the Fixed Payment Study

is to click on a slider and hold it, and to move it to the desired location. If a person uses this strategy successfully, the number of clicks per task would be around three as there are three sliders to complete in each task. If everyone uses this strategy successfully, then the average number of clicks are expected to be around 242 (80.68×3) in Cash condition and 262 (87.33×3) in the Card condition. However, even if a person uses this strategy, the number of clicks per slider may be more than one as the participant may fail to drag the slider all the way to the desired location without dropping it. Another strategy is to click in a location that is roughly judged to be the desired location and then click more as needed to fine tune it. Subjects using this strategy are expected to click much more than the ones using the former one. Because of different strategies that a participant can use to complete a task, the *ClickCount* is not a perfect measure of effort but is a good proxy. We find that the *ClickCount* in the Cash condition is significantly less than the *ClickCount* in the Card condition (316.90 versus 375.74, $p=0.007$ in a two-tailed test). We present our results for correctly completed tasks and for click counts in a bar graph in Figure 1.

We investigate our results further by examining the outcome variables by gender and gamer

	Cash	Card	All
	mean/sd	mean/sd	mean/sd
Tasks	80.68 (15.97)	87.33 (19.72)	83.98 (18.16)
MissedTasks	1.16 (1.36)	1.61 (3.04)	1.38 (2.35)
ClickCount	316.90 (105.59)	375.74 (132.27)	346.08 (122.68)
<i>N</i>	62	61	123

Table 2: Results for the Fixed Payment Study

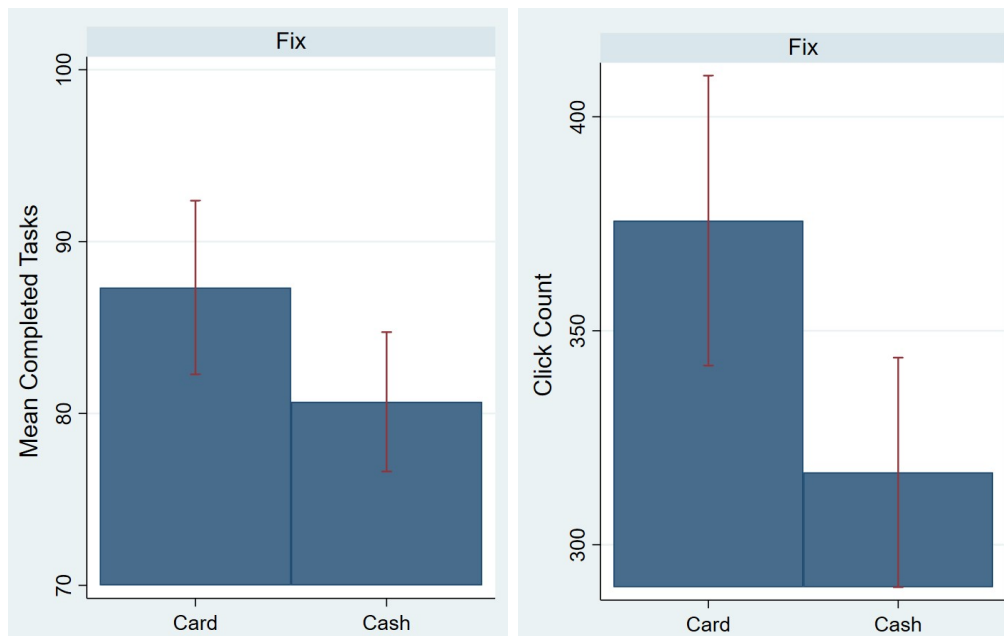


Figure 1: Correctly Completed Tasks and Click Count

	FemaleCash	FemaleCard	MaleCash	MaleCard	AllCash	AllCard
	mean/sd	mean/sd	mean/sd	mean/sd	mean/sd	mean/sd
Tasks	80.50 (15.55)	84.82 (16.51)	81.00 (17.08)	90.29 (22.91)	80.68 (15.97)	87.33 (19.72)
MissedTasks	1.07 (1.33)	1.27 (1.81)	1.32 (1.43)	2.00 (4.05)	1.16 (1.36)	1.61 (3.04)
ClickCount	311.95 (94.90)	359.12 (118.08)	325.91 (124.62)	395.32 (147.02)	316.90 (105.59)	375.74 (132.27)
<i>N</i>	40	33	22	28	62	61

Table 3: Results for the Fixed Payment Study by Gender

status. Table 3 reports the results by gender. The effect of cash as the payment medium on effort is negative for both for males and females, with the effect is more pronounced for males.

In addition to gender, we 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 report the results by gamer status in Table 4. The direction of the effect remains the same irrespective of gamer habits. In fact, the average number of correctly completed tasks is similar in each payment condition across gamer status. Gamers on average complete 80.70 tasks when paid cash compared to 87.31 when paid by card. Non-gamers closely mimic this pattern, with a mean of completed 80.67 tasks when paid in cash compared to 87.34 when paid by card. This table reassures us that our results are not driven by gamers.

Our results support the idea that payment media give cues about the appropriate behaviour in the decision-making environment. Specifically, cash as a payment medium cues participants strongly for the market exchange environment, eliminating the cues for social exchange.

	GamerCash	GamerCard	NogamerCash	NogamerCard	AllCash	AllCard
	mean/sd	mean/sd	mean/sd	mean/sd	mean/sd	mean/sd
Tasks	80.70 (15.59)	87.31 (21.05)	80.67 (16.39)	87.34 (18.99)	80.68 (15.97)	87.33 (19.72)
MissTasks	1.13 (1.36)	2.23 (4.15)	1.18 (1.37)	1.14 (1.77)	1.16 (1.36)	1.61 (3.04)
ClickCount	303.74 (92.99)	403.85 (161.19)	324.67 (112.81)	354.86 (103.51)	316.90 (105.59)	375.74 (132.27)
<i>N</i>	23	26	39	35	62	61

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

Participants in the cash condition are more likely to act according to market norms and consequently complete less tasks than participants in the card condition; participants in the card condition are more likely to act according to social norms. We ran our experiment in a gift exchange environment, in which we expect the direct price effect to be negligible or non-existent.⁹ When the direct price effect is negligible, the psychological effect of the incentive is expected to play a major role. In an environment in which a direct price effect is also expected to be important, we are less likely to observe the psychological effect of the incentive (e.g. the direct price effect overpowers or cancels the psychological effect). To investigate this further, we run another experiment in which the participants are paid using a piece-rate.

⁹According to standard economic theory, the direct price effect should not exist —participants should not exert any effort as the payment does not depend on effort.

5 Piece-rate Payment Scheme

In a second study, we run the same experiment with a piece-rate reward, rather than a fixed reward. In this study, we told participants that they will earn 10 cents for each correctly completed task in addition to their show-up payment of \$10. As before, we had two payment methods, Cash and Card. The task and duration of the task were also the same. There were a number of challenges that needed to be addressed in implementing this study. First, we decided to give the payments before the task completion to make the payment medium salient and to make this experiment as close as possible to the first experiment. However, since their payment depends on effort, we only gave them their show-up fee before they start the task and explained that they will additionally be paid 10 cents for each correctly completed task. Second, we needed to procure the Eftpos cards before the experiment to be able to pay participants. Without knowing the exact number of tasks participants will complete, we either needed to buy several cards in different denominations beforehand, or several cards only in a few denominations with any additional amount to be paid in coins. Since the former option was not feasible, we opt for the latter option. We bought several cards with \$10 or \$15 loaded onto them. If the participant earned between \$10 and \$15 (including the show-up fee), we paid the amount over \$10 in coins irrespective of their payment condition. If the participant earned more than \$15, for participants in the card condition we replaced the \$10 card with a \$15 card and paid the additional amount in coins. Similarly in the cash condition, payments not in denominations of \$5 are paid in a combination of bills and coins.

5.1 Results

We report the summary statistics in Table 5. As in the first study, we see that two samples are closely matched in terms of participants' age, frequency they play computer games participants play, and their field of study. There are slightly more females in the Cash condition compared to the Card condition, although the difference is not significant ($p=0.417$). In

	Cash	Card	All
	mean/sd	mean/sd	mean/sd
Age	22.45 (5.74)	22.06 (5.04)	22.26 (5.40)
Female	0.51 (0.50)	0.44 (0.50)	0.47 (0.50)
Games	2.61 (1.22)	2.53 (1.31)	2.57 (1.26)
STEM	0.39 (0.49)	0.39 (0.49)	0.39 (0.49)
<i>N</i>	67	62	129

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

summary, Table 5 shows that our randomisation was successful and we have comparable samples.

We report the results of this study in Table 6. We find that the correctly completed tasks in the Cash condition are slightly higher than the Card condition, but this difference is not significant ($p=0.694$). Similarly, the *ClickCount* does not differ significantly either ($p=0.674$). The incorrectly completed tasks are very few, as it was in the first study.

We report the results from the first study and the second study together in Table 7 to enable comparison. We observe that the mean task completions are higher in the piece-rate study compared to the fixed payment study. This is expected since the participants in the piece-rate condition are paid depending on their performance —not the case in the fixed payment study. Participants in the cash condition in the fixed payment study exert significantly less effort than all other groups across two studies. This is also evident in Figure 2 and 3 which show the correctly completed tasks and click count together for both studies. Differential results in the piece-rate scheme compared with the fixed payment scheme is likely because of

	Cash	Card	All
	mean/sd	mean/sd	mean/sd
Tasks	93.19 (19.51)	91.81 (20.37)	92.53 (19.87)
MissTasks	1.16 (1.16)	1.34 (1.17)	1.25 (1.17)
ClickCount	349.18 (92.93)	342.60 (83.42)	346.02 (88.21)
<i>N</i>	67	62	129

Table 6: Results for the Piece-rate Payment Study

	Fixed Cash	Fixed Card	Piece-rate Cash	Piece-rate Card	All
	mean/sd	mean/sd	mean/sd	mean/sd	mean/sd
Tasks	80.68 (15.97)	87.33 (19.72)	93.19 (19.51)	91.81 (20.37)	88.35 (19.49)
MissTasks	1.16 (1.36)	1.61 (3.04)	1.16 (1.16)	1.34 (1.17)	1.31 (1.84)
ClickCount	316.90 (105.59)	375.74 (132.27)	349.18 (92.93)	342.60 (83.42)	346.05 (106.22)
<i>N</i>	62	61	67	62	252

Table 7: Results for both Studies

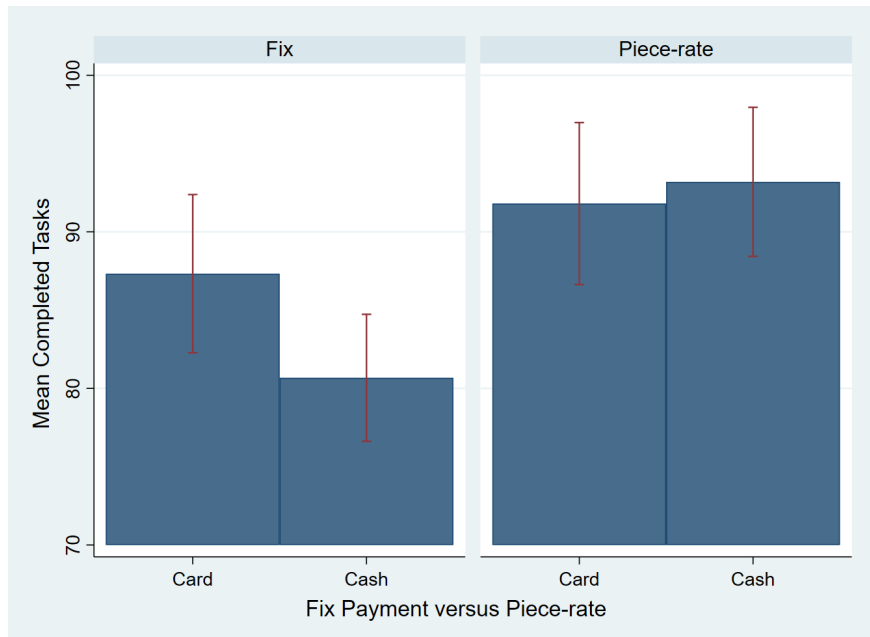


Figure 2: Correctly Completed Tasks Bar Graph

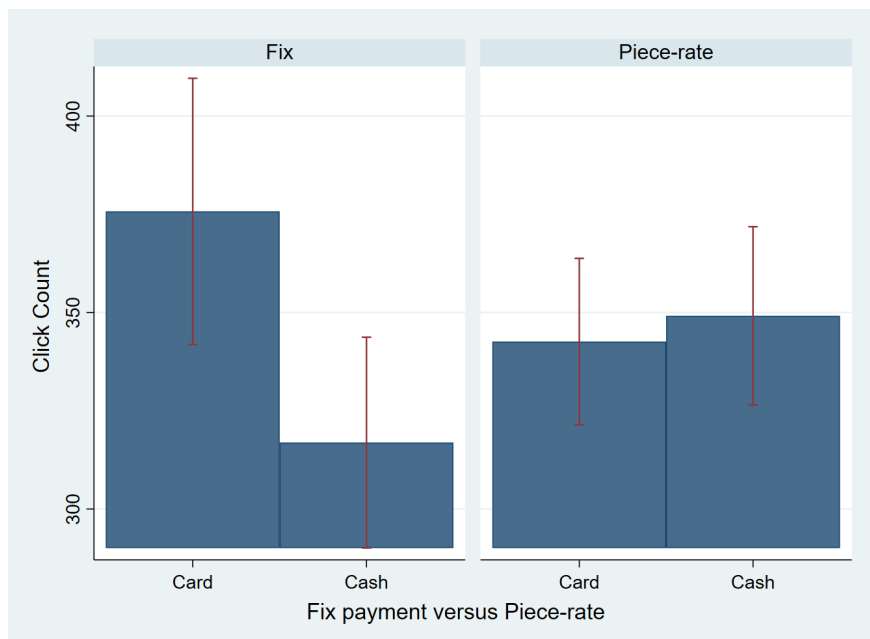


Figure 3: Click Count Bar Graph

the strong direct price effect of the piece-rate scheme. The piece-rate scheme does not only provide direct price effects to incentivise participants to work as hard as possible, but may also cue participants strongly about market norms rather than social norms.

6 Potential Mechanisms

Our results are consistent with the psychological effect created by the payment medium. Specifically, incentives given in the form of cash provide cues to imply that the exchange in the decision-making environment is closer to a market exchange. Incentives given in the form of card, on the other hand, provide cues to imply a social exchange. Below, we investigate other possible mechanisms that may affect effort.

6.1 Preferred Payment Medium

One potential mechanism to create the effect we observe may be participants' preferred payment medium. If most participants prefer card to cash as a payment medium, this would function as if the participant is given a higher incentive when the payment is in the form of a card (the reward is valued higher in the card payment compared to cash payment; Kube et al. [2012]). This cannot explain our results for two reasons. First, we asked participants about their preferred payment medium for different ranges of spending and found that there was no difference in preferred payment medium by payment condition (see Figure 4). Second, if the receipt of a less preferred payment medium caused a decrease in effort in the cash condition, 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 if they were given the option to choose the medium to receive their earning in the experiment. Only very few of the participants preferred card payment and majority

preferred cash in both conditions.¹⁰

6.2 Trust

In experimental economics, participants' trust in the researcher is critical (Bonetti [1998]). If participants do not believe the experimenter, the researcher loses control of the experiment. In our experiment, for example, participants' behaviour in two conditions may be asymmetrically affected if they do not trust the researcher. Cash and card conditions do not only differ in terms of payment medium and the cues these payment mediums provide, 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 assume that there is less than \$20 on the card, this may cause a difference in behaviour. 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 using this participant pool). Second, we gave a signed copy of the consent form to participants, which included the contact information of one of the researchers as well as contact information of the ethics department in the University. Third, if the participant still does not trust the experimenter to load \$20 onto the card, the effect of trust is expected to go against the effect we found. Specifically, a participant who believes they will be paid less than \$20 in the card condition would be less motivated to spend effort. Therefore, it is unlikely for trust to drive our results.

¹⁰In the card condition the preference for cash (card) was 38/62 (8/62). Similarly, the preference for cash (card) was 61/67 (2/67) in the cash condition. The rest reported preferring to be paid with direct deposit/other in both conditions.

6.3 Novelty Effect

When people are exposed to a new system or a new environment, we may observe a temporary short-term boost in performance due to the novelty of the new system or environment rather than the genuine effect of this new system (Wells et al. [2010]). In psychology, this is called a “novelty effect”. If the participants are unfamiliar with an eftpos card, the novelty effect may be suggested to increase the effort level. We think that this is unlikely. First, eftpos card transactions are as common as credit and debit card transactions in Australia. According to 2004 data from The Reserve Bank of Australia, the number of Eftpos payments per capita per year was in between the number of credit card and debit card payments (RBA [2004]). The merchant acceptance rate of Eftpos cards is %90, which also indicates the prevalence of Eftpos cards. Second, even if there is a small fraction of participants who find the Eftpos 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 measure. Therefore, the novelty effect cannot explain our results.

7 Conclusion and Discussion

We tested the effect of two payment mediums, cash and cards, on lab participants’ effort. We studied this effect in two different payment environments; fixed payment and piece-rate payment. We found that the participants paid with cash, compared with cards, spend significantly less effort when they are paid in a fixed payment scheme. In the piece-rate payment scheme, however, the effort levels in both payment mediums increase and there is no difference between them. 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]). Cards cue participants to frame the environment as a social exchange, consequently they act according to social norms and spend effort to pay back the “gift”. Cash, on the other hand, cues participants to frame the environment as a

monetary exchange, consequently they act according to market norms and spend significantly less effort. When we compare the effort levels under the same payment mediums in an environment without gift exchange, specifically when participants are paid piece-rate, the difference between treatments goes away as expected. This is because the direct price effect overcomes the psychological effect. Indeed, we observe the participants making the highest effort in the piece-rate experiments. Our results suggest that the payment medium may affect participants behaviour in experimental studies when payments are not performance-based and when the target phenomenon is related to social preferences.

Our study is a first attempt to understand the effect of payment medium on participants' behaviour. More research is needed to understand the effects of other payment mediums than cash and Eftpos cards and the effects on other type of behaviour than effort provision. Additional questions to investigate are: (1) how other payment mediums may frame the decision-making environment, (2) whether people at different ages infer different norms from different payment mediums, and (3) how norms change with different payment mediums over time. Lastly, if the payment medium affects participants behaviour in the lab, this possibly opens discussions about the effect of the payment medium on people's behaviour in everyday life, which would be an interest for researchers. ¹¹

¹¹For example, the effect of payment medium on productivity of employees, on blood donation behaviour Lacetera and Macis [2010], on job search behaviour of unemployment benefit recipients.

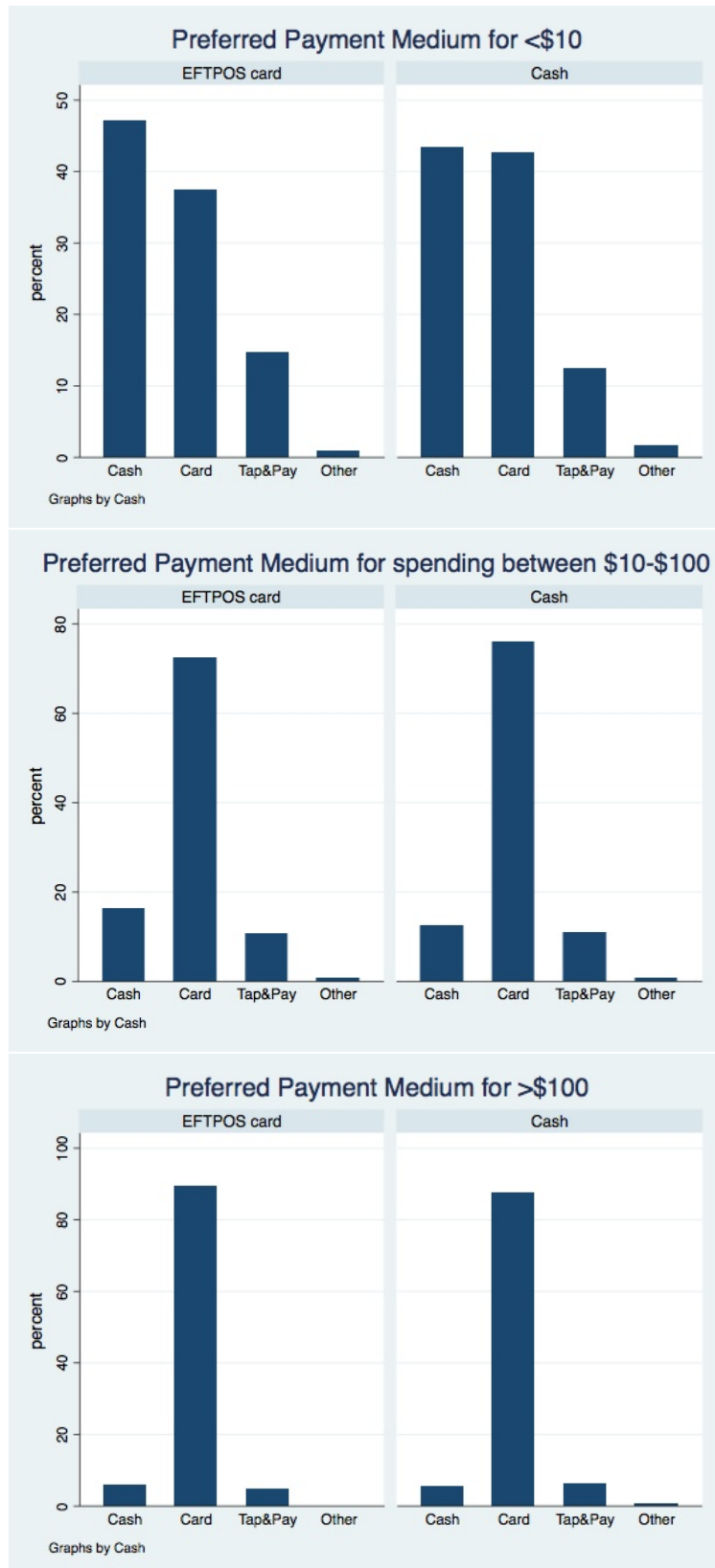


Figure 4: Preferred Payment Medium for Different Ranges of Spending



Figure 5: A Sample Eftpos Card

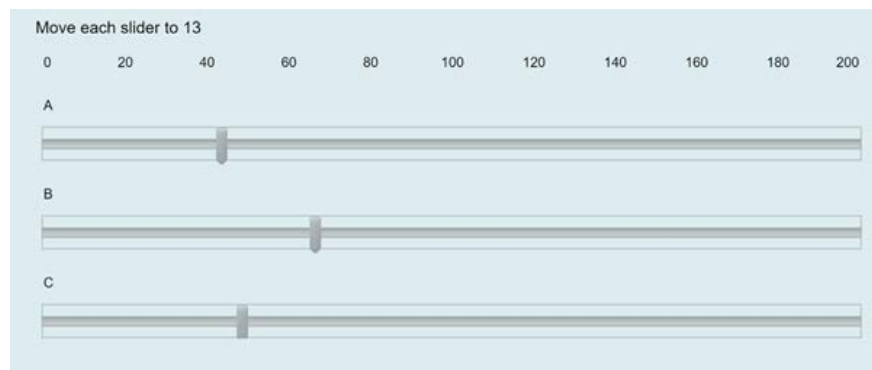


Figure 6: Slider Task

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