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Procrastination and impatience

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ABSTRACT

We use a combination of lab and field evidence to study whether highly-impatient individuals are more likely to procrastinate. To measure impatience, we elicit individual discount rates by giving participants choices between smaller-sooner and larger-later rewards. To measure procrastination, we record how quickly participants complete three tasks: an online game, their application to the university, and a mandatory survey. We find that, consistent with the theory, impatient individuals procrastinate more, but only in tasks where there are costs to delay (the online game and university application). Since we pay participants by check, we are also able to determine whether the participants' cashing behavior is consistent with the timing of their payment choice. We find substantial evidence of time inconsistency. Namely, more than half of the participants who receive their check straight away instead of waiting 2 weeks for a reasonably larger amount, subsequently take more than 2 weeks to cash it.

1. Introduction

Many studies document the prevalence of two arguably harmful behaviors: procrastination and impatience. The tendency for people to give up large future rewards in favor of smaller immediate ones is well documented (for a review see Frederick et al., 2002). In addition, a growing number of studies show that people tend to procrastinate, that is, to defer actions or tasks to a later time with counterproductive consequences (Ariely and Wertenbroch, 2002; Burger et al., 2011; Choi et al., 2006; DellaVigna and Malmendier, 2006). Most economists view these behaviors as two facets of the same phenomenon. Highly impatient individuals weigh immediate costs more and delayed benefits less and thus postpone activities where costs are upfront and indulge in activities where costs are delayed (O'Donoghue and Rabin, 1999a, 1999b, 2001).[1] While this view is increasingly popular (e.g. see, Frederick et al., 2002; Bernheim et al., 2005; Loewenstein and O'Donoghue, 2005; Steel, 2007), there is no direct behavioral evidence supporting it. In this paper we use data collected under controlled conditions to test the existence of a link between procrastination and impatience.[2] Furthermore, we do so for a group of highly-educated and relevant decision makers in the world of business, namely, University of Chicago MBA students.

To elicit the degree of impatience, we ask an entire cohort of MBA students, who previously earned between $2 and $300, whether they want to receive a check with their earnings immediately or a check with a higher amount in 2 weeks time. By varying the size of the delayed amount we get an estimate of each participant's (short-term) discount rate. Like many other studies, we find that participants in our sample exhibit high degrees of impatience: 64.8% of them give up a 2% return over 2 weeks (i.e., an annual discount rate of 67%) in order to receive their earnings without delay. Remarkably, 13.4% of them are not willing to wait even for a 12% 2-week return (i.e., an annual discount rate of 1804%).

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[1] By contrast, a large number of psychologists and the popular press attribute procrastination to anxiety, low self-esteem, and a self-defeating mentality (see e.g., Chissom and Iran-Nejad, 1992; Schouwenburg, 1992; Bandura, 1997; Sapadin and Maguire, 1997; Burka and Yuen, 2008). For an alternative explanation in the economics literature, see Akerlof (1991) who derives procrastination from the saliency of current costs.

[2] Some economists make a further distinction between 'procrastination' and 'delay'. The former being unplanned postponement of an activity caused by incorrect beliefs, and the latter being a planned decision to postpone correctly anticipating future behavior. Throughout the paper, we do not make this distinction and use the term procrastination for both types of postponements.

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We measure the participants' propensity to procrastinate in three ways. First, we launch an online game that lasts 20 min and gave students 4 weeks to participate in it. Crucially, for each of the first 3 weeks of the game, a prize was randomly awarded to one of the students who had participated up to that point. The declining benefit of participation is designed to induce an explicit cost to procrastination. As a second measure, we use the date students applied to the MBA program. Each year, students have three separate time periods, each with a specific deadline, in which to apply to the program. Procrastinating on one's application is costly in that an early response saves candidates the cost of other applications. Finally, as the third measure, we use the number of days students took to answer a mandatory survey. Unlike the first two measures of procrastination, students had to complete the survey before the deadline but there was no penalty for completing it on the last day, which makes procrastinating less costly.

When we use the online game or the application period to measure procrastination, we find a strong and positive relation between impatience and procrastination. By contrast, the relation between impatience and the survey measure of procrastination, although positive, is weak and is not statistically significant. These results give support the conclusion of O'Donoghue and Rabin (1999a) that procrastination is the result of high levels of impatience and costs of delay.

A novel characteristic of this study is that instead of paying participants in cash, we choose to pay them by check. This procedure gives us the opportunity to observe yet another aspect of the participants' behavior, namely how long they take to cash the check. In particular, we are interested in analyzing whether the participants' cashing behavior is consistent with their choices in the discount rate elicitation task. Evidence of dynamically inconsistent choices is rare (Dohmen et al., 2012).[3] In fact, recent research using monetary payments in controlled environments finds little to no aggregate evidence of time inconsistency (e.g., Andreoni and Sprenger, 2012; Sutter et al., 2013; Halevy, 2015). By contrast, we find that a large fraction of students make seemingly inconsistent choices. Specifically, among students who give up an attractive rate of return (above 2% over 2 weeks) and receive their check straight away, a majority of them (57.8%) take more than 2 weeks to cash it; some of them (31.4%) even take more than 4 weeks.

In order to determine whether the surprisingly high amount of inconsistent behavior is due to impatient individuals who procrastinate cashing their check, we regress the number of days students take to cash their check on their elicited discount rate as well as each of the three measures of procrastination. We initially obtain mixed results. While the measures of procrastination are significantly correlated with the students' cashing behavior, the elicited discount rate is not. However, as we demonstrate by modeling the students' choices assuming they possess present-biased preferences (Laibson, 1994; Strotz, 1956), this lack of significance could be due to an attenuation bias caused by unobserved heterogeneity in the costs of cashing the check. Consistent with this hypothesis, a two-step regression approach where we first regress the discount rate on the three measures of procrastination and then reevaluate the relation between discount rates and the days to cash the check results in a positive and significant association between the two.

The rest of the paper proceeds as follows. Section 2 describes the data used; Section 3 evaluates the association between the three measures of procrastination and impatience; Section 4 analyzes the students' cashing behavior and its relationship with the measures of impatience and procrastination; and Section 5 concludes.

[3] The two best examples are Read and van Leeuwen (1998) who find inconsistent choices over time with respect to snack foods and Augenblick et al. (2015) who find evidence of inconsistency in the allocation of effort over a 7-week period.

2. Data

In this paper, we utilize data from the Templeton-Chicago MBA longitudinal study (TCMLS). As part of a long-term research project on individual characteristics and economic success, the TCMLS collects data from the 2008 MBA cohort at the University of Chicago Graduate School of Business (see Reuben et al., 2008). In the paper, we restrict our analysis to the 284 students who participated in all the activities related to this study. In Appendix B, we evaluate whether there was selection into the different parts of the study by comparing the observable characteristics of students who completed all activities and those who did not.[4] By and large, we do not find differences between the two samples.

2.1. Measuring impatience

As our measure of impatience, we use the participants' short-term discount rate, which was elicited in a laboratory experiment run in October 2006. The experiment consisted of two lotteries, five games, and a task designed to measure short-term discount rates. The games were played in the following order: lottery with losses, asset market game, trust game, competition game, chocolate auction, social dilemma game, and lottery without losses. The games were programmed in z-Tree (Fischbacher, 2007) and played in four large classrooms. In order to give students an incentive to take their decisions seriously, they were paid according to their performance. One of the games was randomly drawn and participants were paid according to their earnings in that game. Students who participated in the experiment earned on average $78.32 in addition to a $20 show-up fee, which was paid in cash at the beginning of the session. In this paper we concentrate on the task designed to measure short-term discount rates. A short summary of the procedures and the instructions of this task are available in Appendix C. For a description of the other games see Reuben et al. (2008).

We elicit short-term discount rates by giving participants a series of simple choices of the following type: receive x dollars today or receive $(1+r)x$ dollars in 2 weeks, where x equaled each participant's earnings in the abovementioned experiment. Each participant answers 13 questions, with r varying from 0 to 0.12 in steps of 0.01. At the end, one of the questions is randomly selected and implemented. If, for a given r and x, a participant prefers x dollars today, we can infer that she is willing to sacrifice r% of earnings in order to receive the payment today instead of in 2 weeks. Thus, by varying r and observing the point where participants switch from payment today to payment in 2 weeks, we get a small interval (of 0.01 width) that contains each individual's short-term discount rate. Throughout the paper, we refer to the switching value of r as an individuals discount rate, although it should be understood that the actual discount rate lies in the interval $[r-0.01, r]$. We chose this procedure because it is incentive compatible and simple to understand. In this sense, it is encouraging that, even though we did not restrict the participants' choices, none switched in the "wrong" direction (from late to early delivery).

Fig. 1 plots the discount rate (over 2 weeks) at which students switch toward the late delivery. Roughly one third of the students switch at 1%, which, in the absence of other considerations, is the level a rational exponential discounter is expected to choose. However, two thirds exhibit a larger discount rate, with almost 15% of the students not switching even at the 12% rate, which in annual terms corresponds to a discount rate of 1804%. Table 1 reports the summary statistics for this variable, where we impose a discount rate equal to 13% on all the students who did not switch (even for $r = 12\%$).

The use of monetary rewards to elicit discount rates has been criticized (Cubitt and Read, 2007) because access to credit may

[4] Out of 475 participants who consented to the use of their admissions data, 432 completed the discount rate elicitation task, and 284 participated in the online game.