



# Education, Behaviour and Policy

PROJECT REPORT

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## Introduction

A person's choice of education is one of the most important investments that she will ever make. It is one that will influence every aspect of her life, from career outcomes, lifetime earnings, family outcomes, and health. Yet, little is known about whether the investments in education that people choose are fully rational.

There are two key reasons for suspecting that they may not be. First, a large empirical literature has shown that marginal rates of return to education are generally high, thus suggesting that individuals underinvest in education (Card 2001). What is preventing students from staying in school longer and completing larger investments in their human capital? The reasons are yet not fully understood. For instance, research has found that credit constraints cannot adequately explain low participation in the UK (Carneiro & Heckman 2002). Second, it is well understood from other contexts that people systematically fail to make adequate choices in investment contexts. One of the most notable examples is in terms of saving for retirement. Indeed, retirement savings has been a key area of application for behavioural economics, in particular in terms of modelling individuals' inability to make and stick to consistent intertemporal choices (Laibson 1994).

More broadly, behavioural economics has had a major influence on research in economics across a wide area of applications, from finance and macroeconomics to micro-level social behaviour. However, behavioural economics modelling has yet to enter research on education (Lavecchia, Liu and Oreopoulos 2014).

## Overview of Objectives, Methods and Results

The current project has been one of the first to adopt a systematic behavioural perspective on education choices. The overarching aim has been to explore whether concepts and ideas from behavioural economics can help us explain and predict individuals' education choices. In addition to the aforementioned focus on intertemporal choices, a second key focus of the behavioural economics literature has been on choices involving risk, where the concept of "loss aversion" has been particularly influential.

The main findings of the project confirm that behavioural influences on youth's educational investment can be expected to lead to systematic under-investments in education and under-provision of effort. These influences can occur both in the small and in the large. For instance we find that students, when devoting effort to a given assignment, display a demand for commitment; this is consistent with a systematic self-control problem leading to procrastination and an under-supply of effort (Anderberg, Cerrone & Chevalier 2016). At the other end, we find that aversion towards disappointment can be expected to influence substantially larger choices, most notably the school-leaving age (Anderberg & Cerrone 2016).

In short, the current project has successfully embarked on an agenda of incorporating behavioural economics into the analysis of education choices. In doing so, it has identified a set of initial results that demonstrates the relevance of the approach and encourages further work in the area.

## Disappointment and Procrastination in Education Choices

The aim of the project was to explore whether firmly established concepts from behavioural economics, including loss-aversion and dynamic inconsistency ("procrastination") impact on educational investments. The research methods applied in the project have combined theoretical and experimental approaches, depending on the context explored in the various subprojects.

## Investment in Education under Disappointment Aversion

In a first part of the project we set up and analyzed a theoretical model of investments in education under uncertainty (Anderberg & Cerrone 2016). The emphasis on uncertainty provided the angle towards behavioural economics, most notably towards "loss aversion". The concept of loss aversion refers to people's tendency to prefer avoiding losses to acquiring equivalent gains. As such, it relies on the underlying notion of a reference point -- a no-loss/no-gain outcome. While the concept of loss aversion has a long tradition, there is less consensus on what constitutes an individual's reference point.

The model analyzed in this part of the project assumed that the reference point is "internal" to the individual and directly related to her aspiration. Formally, this meant assigning as reference point the individual's expected (or "average") outcome given her own academic ability and effort. Ability and effort are natural complements, implying that more academically gifted students opt for larger investments. But the notion of disappointment aversion (defined as loss aversion relative to the expected outcome) comes heavily into play.

Under natural assumptions on the investment process, our work highlights how accounting for disappointment aversion leads to a wider dispersion of investments in education. Youth with lower academic ability hold back on their investments in order to avoid raising their expectations and risking disappointment. On the other end, youth with higher academic ability extend their effort in order to reduce the risk of failure and thus disappointment.

A preliminary empirical application based on data from the National Child Development Survey (NCDS) was shown to be consistent with the predictions of the model (Anderberg & Cerrone 2014). The sample included all male NCDS cohort members (i) who reported to have left full time education between the ages of 16 and 24, (ii) for whom we observe an hourly gross wage at age 33, (iii) for whom we have general ability, math and reading test scores. This leaves us with a sample of 2,632 males (for further details, see Anderberg & Cerrone, Appendix A). Further work is needed, with stronger identification strategies, in order to verify these preliminary findings.

If verified, the mechanisms highlighted in this work would have strong policy implications, most notably in terms of supporting and encouraging investment in education among students from disadvantaged background and with lower academic preparedness for post-compulsory studies.

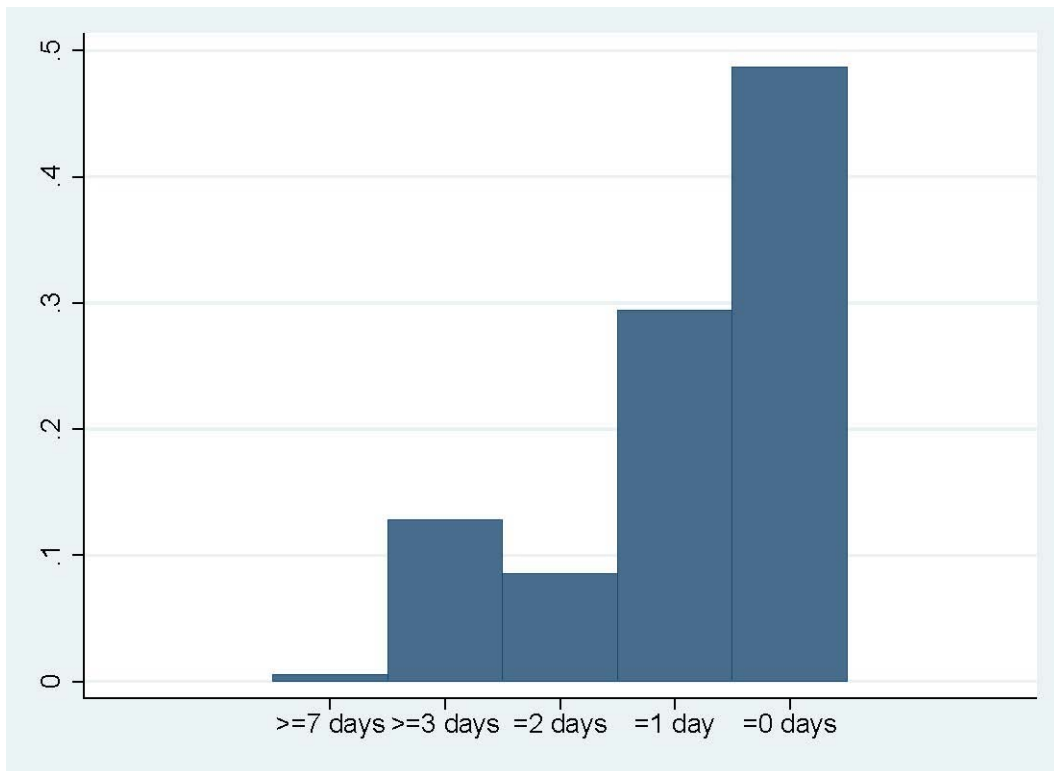
## Procrastination and the Demand for Commitment

One of the most well-established findings in the behavioural economics literature is the inability of individuals to make consistent intertemporal plans and then carry them out. Individuals' tendency to procrastinate influences a large set of decisions from the small to the large: losing weight, exercising, scheduling medical check ups, returning defective items, submitting homework, filing taxes, saving for retirement etc.

A key feature of the procrastination problem is that, if individuals are aware of their self-control problems, then they should also demand "commitment" devices that discourage procrastination. There is however little systematic evidence of commitment demand in general and among students in particular. Students work on numerous tasks throughout their studies, from completing assignments to preparing for exams. The standard theory of procrastination suggests that they would be systematically underproviding effort -- or more succinctly -- "too little, too late". We test in an in-class setting whether students perceive a self-control problem and demand commitment in relation to the completion of a standard real-life assignment (Anderberg, Cerrone & Chevalier 2016).

The study design was simple but effective. The sample was given by 211 1<sup>st</sup> year university students from Royal Holloway University's School of Management. 51% of the students were male and 49% female. The age ranged from 17 and 52, and the average age was 19. As part of the course "Markets and Consumption", they students had to complete an assignment (an essay) within three weeks. As part of our study, they were asked to complete a short survey which automatically entitled them of a lottery ticket with a small expected value (£5). The survey further asked each student to nominate an individual deadline for the essay, which could be the official deadline or an earlier date. If the student subsequently failed to comply with the self-nominated deadline, his/her lottery ticket would become invalid. Since early submissions did not give the students any rewards, they had no reason to self-impose an early deadline other than their desire to avoid procrastination: by self-nominating an earlier deadline, the student would provide herself with an incentive to start working on the task earlier, thus hopefully avoiding procrastination.

The results were stark. Consistent with our theoretical predictions, we observe a strong demand for commitment, 41% of the sample. The results are illustrated in the figure below, which shows the distribution of the number of days ahead of the official deadline the students placed their own self-nominated deadline. 59% of the students chose the official deadline, over 20% chose the day before, and others choose 2 or more days ahead of the official deadline. However, we also observed a positive fraction of those "committed" subsequently breaking their own early deadlines; this would be consistent with the idea that students may face unexpected factors (e.g. sickness).



The clear evidence for a demand for commitment raises the question of what types of students demand commitment. We find that students who expect the task to be more "onerous" (in terms of the time they expect the task to require and how they expect to perform relative to their peers) are more inclined to demand commitment. Also, students who are reluctant to take risk are less willing to self-impose a commitment. Non-compliance exhibits substantial randomness, but does correlate with some personality traits. Openness/extraversion is associated with a higher non-compliance rate, whereas conscientiousness/emotional stability is associated with a higher compliance rate.

This part of the project thus provides clear evidence in a field-study setting that students' effort choices are affected by procrastination. This has key implications for how to support students in setting goals and sticking to study effort plans so as to achieve the best possible outcomes.

## Conclusion

The project has taken some initial steps towards integrating behavioural economics into the analysis of educational choices. The natural expectation, based on well-established theories in behavioural economics, would be that key inconsistencies in individual behaviour with respect to choice over time and under uncertainty – which is the hallmark of educational choices – would lead to sub-optimally low investments in education. This would extend to both small – like effort choices in relation to specific assignments – and large decisions – like when to leave full time education. Using a mix of theoretical and experimental methods, our work has provided an initial affirmative answer to the question of whether deviations from rational and consistent choices - predicted by behavioural economics - would imply that individuals may under-invest in education. If these conclusions are further supported by future research, they will provide a strong case for policy to support investments in education, particularly for individuals with lower academic ability and/or a relatively disadvantaged background. In fact, as shown by Anderberg & Cerrone 2016, such individuals may decide to drop out of school relatively soon in order to avoid raising their (earning) expectations and thus risking disappointment.



## References

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