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Young, gifted and lazy? The role of ability and labor market prospects in student effort decisions☆

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ABSTRACT

This paper examines the decision-making process of students from an economic perspective to understand the determinants of an individual's willingness to provide effort. Our theoretical model predicts that ability and job market prospects are positive determinants. Analyzing a novel dataset on thousands of German students, however, we instead find that ability has a significantly negative effect on effort. It seems that the marginal gain of increasing effort in terms of higher expected income after studying is lower for high-ability students compared to low-ability students. In regard to the second determinant, the evidence rejects a similar argument, according to which great job market prospects may impair student effort. Applying an instrumental variable approach based on official unemployment data on regional labor markets, we can confirm our prediction on the positive role of perceived employment prospects in actual student behavior.

1. Introduction

The circumstances under which individuals strive are central to scientific research on human behavior. The economic approach suggests that individuals provide high efforts whenever the expected benefits of an activity exceed the expected costs. However, we know little about the determinants of effort outside of experimental laboratories. Similarly, situations when individuals – instead of providing high efforts to maximize their economic gain – make the decision to simply lean back remain largely unexplored. In some cases, individuals with particular potential and great prospects may show high motivation to provide extraordinary performance, while in other cases, a positive outlook may actually lower effort levels, as it is possible to benefit from reduced effort costs while still obtaining a satisfactory level of achievement. By focusing on students from higher education institutions, we analyze individual effort decisions, which allows us to not only shed light on the determinants of human behavior in this particular educational context, but also beyond.[1]

The decision situation faced by students in the system of higher education has a particular facet that makes it very interesting from an

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[1] Microeconomic models of individual effort decisions typically include assumptions on the role of an individual's potential, such as ability, without providing references to empirical evidence. This is not surprising, given a lack of studies that focus specifically on the question of how ability affects effort. While a lot of evidence on determinants of individual effort levels comes from economic laboratory experiments, researchers here oftentimes inspect mindless tasks to purposely render certain inputs like ability irrelevant. Economic researchers of field data often fall back on proxies like absenteeism (see e.g. Block, Goerke, Millán, & Román, 2014; Chadi & Goerke, 2018; Cornelißen, Himmler, & Koenig, 2011; Ichino & Riphahn, 2005), or hours worked (see Bell & Freeman, 2001), given the importance of effort and its determinants in a variety of different research contexts, as e.g. workers' performance in firms. Another option for researchers to gather evidence from the field is professional sports, which allows testing economic predictions on effort decisions in non-laboratory data (see e.g. Lackner, Stracke, Sunde, & Winter-Ebmer, 2015).

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economic standpoint: Both society and the individual student benefit from educational achievement. The more educational achievement can be attained, the higher the individual labor market earnings are because of increased human capital (e.g. Chevalier, Harmon, Walker, & Zhu, 2004; Kroch & Sjoblom, 1994; Wolpin, 1977), which thereby fosters overall economic prosperity. To achieve this, students can choose individual effort levels as a major determinant of educational outcome (e.g. Stinebrickner & Stinebrickner, 2008). This leads to a scenario in which students have incentives for putting large amounts of effort into studying, benefiting both the economy and society. In reality, however, indications suggest a lack of effort levels among students, such as declining amounts of time spent on studying (e.g. Babcock & Marks, 2011) and increasing study durations in numerous countries (e.g. Bound, Lovenheim, & Turner, 2012; Brunello & Winter-Ebmer, 2003; Garibaldi, Giavazzi, Ichino, & Rettore, 2012). This raises the questions regarding the determinants of study behavior and how the drivers of students' commitment to performing well can be identified.

While there is a sizable literature on the outcomes of studying, there are not many studies dealing with economic decision-making in terms of student effort in higher education. Many of the contributions to research on educational achievement of university or college students focus on study outputs, such as grades, and analyze potential determinants, such as financial incentives or working during school (e.g. Kalenkoski & Pabilonia, 2010; Stinebrickner & Stinebrickner, 2003).[2] Few papers provide a combination of empirical analysis and theoretical modeling, in which the latter considers the crucial role of student effort as a contributor to academic success (see e.g. Bandiera, Larcinese, & Rasul, 2015; Krohn & O'Connor, 2005; Löfgren & Ohlsson, 1999).[3] One example in this context is a study by Oettinger (2002), who discusses how university students make strategic decisions on effort levels, for which he assumes that incentives to provide effort increase in ability. In their study on student performance, Leuven, Oosterbeek, and van der Klaauw (2010) also take the role of effort into account but mostly focus on passing rates and how student performance can be raised by financial incentives. Similarly, Non and Tempelaar (2016) consider both effort and academic success in their empirical study on the role of time preferences, just as Chevalier, Dolton, and Lührmann (2018) do in their study on incentive schemes. There is also recent theoretical work on the role of examination rules for students' effort decisions (Michaelis & Schwanebeck, 2016).

Apart from that, we concur with the conclusion of Delaney, Harmon, and Ryan (2013) who see a clear lack of knowledge on student inputs, despite the high level of interest in explaining study outcomes. While these authors provide the first empirical investigation into the determinants of student behavior in higher education using across-subject data, they omit two determinants that we consider to be as important as they are unclear in their actual role for effort decisions: ability and labor market prospects. Intuitively, one could expect that high-ability types have strong incentives to provide extra effort, as they benefit more from educational achievement, which also seems to be in line with the evidence from the above-mentioned studies. On the other hand, they could also use their promising situation to reduce effort when they are satisfied with a certain level of achievement. Similar arguments apply for job market prospects in general, which could also affect student behavior and help to explain low effort levels. Given the unclear relationships, we provide the first comprehensive discussion, theoretically and empirically, on how these factors affect students' effort.

As a potentially important aspect, we consider multiple dimensions of student effort in our discussion. Whereas previous educational studies often focused on study time measured via lecture attendance, the role of this factor in educational achievement appears to be unclear.[4] Given the heterogeneity of empirical findings in this context, we scrutinize whether study time is sufficient for capturing individual effort and question the underlying assumption that investing the same amount of time means investing the same amount of effort. Arguably, any given hour spent in the library or in the lecture room may consist of only focused learning, but it may just as well consist of only idle daydreaming. We therefore propose a distinction into a quantitative and a qualitative dimension of effort in order to learn more about the complex factor that effort certainly is. While in our theoretical discussion we distinguish between study time (quantitative dimension) and learning intensity (qualitative dimension), we attempt to capture the quantitative component via comprehensive time-use data and the qualitative component via subjective data on self-assessed effort levels in our empirical investigation.

In our theoretical modeling of student decision-making, we make some basic assumptions that conform to the previous literature. Students decide about both effort dimensions anticipating that higher effort is associated with a utility decline today, but improves educational achievements and hence increases expected income and utility after studying. Whether high-ability students provide less or more effort compared to low-ability students depends on two factors. First, considering each effort dimension separately, high-ability students have an incentive to increase effort, such as study time (at the expense of leisure), because this raises utility in the future, i.e. the substitution effect (SE). At the same time, however, high-ability students have an incentive to reduce effort because their high abilities per se ensure relatively good educational achievement and thus a relatively high level of expected income, i.e. the income effect (IE). Second, the way both effort dimensions are interlinked is crucial. If they were complements, high-ability students that provide high learning intensity would also choose a high study time, compared to low-ability students. If both dimensions were substitutes, however, high learning intensity would come at a price of lower study time and vice versa. These mechanisms also hold for our second determinant, i.e. job market prospects.

To gain testable predictions, we assume that both the students' utility and educational production function are of a Cobb-Douglas type. This implies that a.) the SE dominates the IE and that b.) both effort dimensions are complements. As such, we expect that high-ability students provide higher effort (study time and learning intensity) compared to low-ability students. In addition, better job market prospects should increase the students' effort in both dimensions during academic studies. The mechanisms in our model translate to many other economics contexts and thereby provide us with a general framework upon which we can discuss our empirical results. This is particularly helpful as our empirical findings for individuals in higher education do indeed deviate in some respect from expectations one may have at first glance.

To test theoretical predictions, we explore data from a broadly conceived investigation of students in Germany's system of higher education, the National Educational Panel Study (NEPS). The students'

[2] Other indicators of study outputs in the context of higher education are graduation rates (e.g. Light & Strayer, 2000) and study durations (e.g. Gunnes, Kirkebøen, & Rønning, 2013).

[3] Note that there are also some studies discussing the importance of student effort for educational achievement among pupils before they enter higher education, such as Metcalfe, Burgess, and Proud (2019) as well as De Fraja, Oliveira, and Zanchi (2010) who also point out a lack of research on the role of student effort.

[4] See Grave (2011) for a comprehensive study on the role of students' time allocation in educational achievement. While she finds rather positive relationships between the latter and both lecture attendance and self-study time for her data on German university students, Dolton, Marcenaro, and Navarro (2003) find a more positive role of attendance compared to self-study using data on Spanish university students. In contrast, Bratti and Staffolani (2013) find the opposite for Italian university students and view self-study as a more important predictor of academic performance than attendance.