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journal homepage: www.elsevier.com/locate/jeboBehavioral economics of education[☆]Alexander Koch^{a,b}, Julia Nafziger^a, Helena Skyt Nielsen^{a,b,*}^a Department of Economics and Business, Aarhus University, Fuglesangs Allé 4, DK8210 Aarhus V, Denmark^b Institute for the Study of Labor (IZA), Bonn, Germany

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ABSTRACT

During the last decade knowledge about human behavior from psychology and sociology has enhanced the field of economics of education. By now research recognizes cognitive skills (as measured by achievement tests) and soft skills (personality traits not adequately measured by achievement tests) as equally important drivers of later economic outcomes, and skills are seen as multi-dimensional rather than one-dimensional. Explicitly accounting for soft skills often implies departing from the standard economic model by integrating concepts studied in behavioral and experimental economics, such as self-control, willingness to compete, intrinsic motivation, and self-confidence. We review how approaches from behavioral economics help our understanding of the complexity of educational investments and outcomes, and we discuss what insights can be gained from such concepts in the context of education.

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1. Introduction

Deciding how much to invest in their education is one of the most important economic decisions people make during the course of their lives. Education improves a range of important individual outcomes such as life-time earnings (Heckman et al., 2006), health, absence of delinquency or good citizenship (Lochner, 2011). Yet, many of the observed education investment decisions and outcomes seem puzzling when viewed through the lens of a standard economic model. For example, a sizeable proportion of students drop out of education just at the point in time where the returns appear to be at their maximum (Oreopoulos, 2007; Heckman et al., 2006), a tendency to shy away from competitive settings makes many girls underperform on math tests or avoid math courses altogether although the future returns are substantial (Niederle and Vesterlund, 2010; Joensen and Nielsen, 2014), and systems for grading and ranking students have a robust effect on educational achievement even if one controls for ability (Jalava et al., 2014; Murphy and Weinhardt, 2014).

In this paper, we review how a range of concepts and questions studied in behavioral and experimental economics can enhance our understanding of the complexity of educational investments and outcomes and thereby help explain the puzzling empirical evidence described above.

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* Corresponding author at: Department of Economics and Business, Aarhus University, Fuglesangs Allé 4, DK8210 Aarhus V, Denmark.

Tel.: +45 2921 6971; fax: +45 87150201.

E-mail addresses: akoch@econ.au.dk (A. Koch), jnafziger@econ.au.dk (J. Nafziger), hnielsen@econ.au.dk (H.S. Nielsen).

Behavioral economics incorporates insights from psychology and sociology into standard economic theory to better understand human behavior.¹ It is often complemented by experimental evidence on actual behavior. Together these two fields suggest that people have non-standard preferences (such as preferences for fairness, time-inconsistent preferences and reference dependent preferences), they have non-standard beliefs (e.g., they are overly self-confident about their abilities or they hold self-serving beliefs) and they engage in non-standard decision making by responding to framing of choices or emotions (cf. DellaVigna, 2009).

As we argue, one needs reference to a range of these concepts to better understand educational outcomes. We need reference to self-control problems (time-inconsistent preferences) or self-confidence in order to better understand why many people invest too little in education. We need reference to experimental evidence on differences in how people respond to competitive pressure to better understand why women are less likely to excel in math or apply for elite education. We need reference to behavioral theories of motivation to better understand why relative rank in academic achievement within a class often influences academic outcomes independently from ability.

The concepts studied in behavioral and experimental economics are closely related to what is often referred to as “non-cognitive skills” or “soft skills” in the literature on economics of education.² Such soft skills encompass personality traits, goals, motivations, and preferences that are valued in the labor market, in school, and in many other domains (Heckman and Kautz, 2012). While the field of economics of education by now recognizes that cognitive skills (as measured by test scores) and soft skills have similar importance for educational achievements, soft skills are often treated as a black box summarized by a parameter in the utility or production function. As we outline in this review, applying models from behavioral economics and insights from laboratory and field experiments help us to better understand what is going on inside this black box, which in turn helps us to better understand investments into education.

The review provides a selected coverage of topics from behavioral and experimental economics. Compared to other review articles in behavioral economics, we do not structure this review along the most prominent “behavioral biases” such as reference dependent preferences, social preferences, time-inconsistent preferences, or non-standard beliefs. Rather we focus on those concepts from behavioral and experimental economics that seem particularly relevant for understanding investments into education. For example, there are several experimental studies that examine the development of social preferences in children.³ Yet, (at least up to now) the impact of social preferences on educational investments outcomes has not been examined and thus we do not review this literature further here. Further, we focus on theoretical and experimental studies in combination with empirical evidence. In a complementary review, Lavecchia et al. (2014) survey intervention studies that are inspired by behavioral economics.

Combining the two lines of thinking embodied in the literatures on economics of education and behavioral economics offers many insights, as we argue. Yet there are some caveats: First, there is a caveat regarding the use of experiments to gain insights into the economics of education. While much of the empirical research in the educational literature is conducted using large panel data sets and well-defined population models, most lab and field experiments use convenience samples, low stakes and rely on the experimental random assignment method. In addition, the tasks in the lab are sometimes artificial compared to real world decision making. Although there is some replication of the main results with more representative samples, high stakes, and in field settings (see Falk and Heckman, 2009, for a discussion), additional research is needed. Further, the results from experimental economics mostly shed light on short run effects (e.g., how extrinsic incentives affect motivation) because long run effects cannot easily be observed in the laboratory or even field experiments. Second, there is a caveat about using behavioral economics, which relies on the same techniques and models as standard economic theory. Its aim is to enrich standard economic theory with more realistic assumptions about human behavior – based on insights from psychology or sociology. Thereby, it comes with its own set assumptions. And these assumptions also have to be validated empirically. As a consequence, many models in this field still are evolving (e.g., see the discussion of how models of reference dependent preferences progressed in Barberis, 2013). Thus, while we think that insights from behavioral and experimental economics can enhance our understanding of educational decision making, care should be taken when interpreting and applying the results.

The remainder of the paper unfolds as follows. Section 2 briefly describes how economics of education often models student achievement as outcomes of an education production function (Hanushek, 1979; Todd and Wolpin, 2003) that depends on individual skills and abilities, as well as the history of family inputs, school and pre-school inputs, and in some cases also peer inputs. We then review evidence on the importance of soft skills for educational achievement and we outline how researchers have applied soft skills in the field of economics of education. Noting that many of the factors of interest are closely related to the concepts studied in behavioral and experimental economics, we review in Section 3 relevant articles from these fields. Section 4 links back to the education production function by describing how concepts from behavioral and

¹ For an overview of the field of behavioral economics see Rabin (1998) and DellaVigna (2009).

² They are also sometimes described as socio-emotional skills or meta-cognitive skills.

³ Children become fairer, and less spiteful as they become older (Fehr et al., 2008, 2013; Almás et al., 2010). Sutter et al. (2010) distinguish different social preferences and observe that inequality aversion becomes less prevalent with age, while efficiency concerns become more important for boys and maximin preferences more important for girls. Parochialism first becomes significant in the teenage years (Fehr et al., 2013). Further, trust increases from early childhood to early adulthood (Sutter and Kocher, 2007). Belot and van de Ven (2011) show the importance of friendship ties by establishing that children are biased in favor of their friends.

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