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Fabian Lensing, M.Sc., M.Sc.

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1 Introduction

As early as the eighteenth century, economists had discovered that aggregate social and economic behavior is a result of decisions at an individual level (Smith 2010). Thus, to understand overall social and economic behavior, we need to understand how individuals make decisions. Observing human behavior is one way to determine what drives decisions at an individual level. Accounting for the individual's characteristics, predispositions and preferences and for external parameters describing the decision situation, we can make inferences about the decision-making mechanisms which explain an observed behavior. By understanding these mechanisms, we can, in turn, try to predict or even influence individual behavior and, as a result, overall social and economic behavior.

Given the importance of individual behavior for our societies and economies, it is not surprising that theories aiming at understanding and predicting individual behavior are a major focus in economic research. Since the fundamental work of the Scottish economist Adam Smith for what is nowadays subsumed under the term 'behavioral economics', attention to this field of research has grown constantly. Key contributions include the rejection of Adam Smith's general assumption of pure rationality by Nobel laureate Herbert Simon. He formulated the theory of bounded rationality, highlighting that individuals do not always have all the information required to make the most rational choice (Simon 1955). Richard Thaler, who was also awarded the Nobel Prize in Economics, underlined another limitation of Smith's original theory of rational choice. Thaler showed that not only the lack of knowledge or awareness of all information but also different, and rationally not explainable, mental perceptions of the same outcome play a role in individual behavior (Thaler 1994). This interdisciplinary view built a bridge between traditional economics and psychological approaches to explain decision making and individual behavior (The Royal Swedish Academy of Sciences 2017). Through explaining and illustrating underlying mechanisms such as unconscious biases in decision making, his own work and collaborations with other renowned researchers such as Daniel Kahneman, Amos Tversky, and Cass Sunstein (e.g. Thaler 1980, Thaler et al. 1997, Thaler and Sunstein 2009) have gained great attention, not only in the academic world.

In this dissertation, I aim at contributing to this large and growing body of academic literature on behavioral economics. I use different economic theories to derive testable hypotheses in order to analyze and explain the behavior of individuals in two different fields of research, namely education and sports. For this purpose, I study real-life situations in education and sports to make inferences about the underlying mechanisms that help understand individual behavior.

From a methodological perspective, I apply quantitative methods and analyze data which are drawn from ‘natural experiments’ in the sense of Joshua Angrist’s, Guido Imbens’, and David Card’s work (for a description of their work see Ball 2021). More specifically, the data is not gathered from artificial experiments, e.g. in laboratory settings, but *real* interventions in *real* life. Thus, researchers do not design and run such natural experiments but rather observe the effects of interventions in real life driven by the general environment or third parties. Key advantages of this methodology include the avoidance of selection biases, the validity of methods and findings and the chance to identify causal relationships (The Royal Swedish Academy of Sciences 2021).

1.1 Research Fields Education and Sports

The research fields for my studies on individual behavior are education and sports. More specifically, in the first three studies I analyze the behavior of so-called ‘high-ability’ students during their higher education and on the threshold of entering the labor market. Three arguments made me choose this first research field:

First, education is widely cited as a key driver for wealth and health in today’s societies and economies (Grossman 1972; Behrman and Wolfe 1989; Berger and Leigh 1989; Hartog and Oosterbeek 1998). Understanding the decision mechanisms of individuals in (higher) education is, thus, highly relevant for every individual and society as a whole.

Second, higher education can generally be seen as a system which can be described and measured well since it is largely defined by a framework of transparent standards and policies (for example, standards for degrees and study curricula; see Clark 1983). This transparency about the system in which an individual makes decisions and behaves accordingly provides good preconditions to apply quantitative empirical research methods.

Third, I was fortunate to have access to a large and hitherto unused database of a German scholarship organization¹. This database allowed a clear identification of both external framework conditions and individual predispositions. Furthermore, the database exclusively contains information of high-ability students, namely students with excellent performance in secondary education. Thus, the sample of students, whose decisions and behavior is analyzed in my research, is relatively homogeneous in certain characteristics, i.e. their academic performance. This homogeneity in terms of academic performance allows to focus on other socio-demographic and external factors when analyzing the students' behavior empirically.

Furthermore, I looked at the behavior of individual endurance athletes in a semi-virtual world in the fourth study of my dissertation. In particular, I analyzed the drivers of motivation and behavior of amateur triathletes on sport-specific social media platforms. The motivation to choose this second field of research is twofold. On the one hand, triathletes are also often cited as a relatively homogeneous group of individuals (Wicker et al. 2012) which is beneficial to empirical research methods as described above. On the other hand, analyses of motivation and behavior in a completely different environment (social networks) provide the chance to complement the results of my research in the first field (education) since this is focused mainly on real world environments.

1.2 Structure, Research Problems and Theoretical Approach

The core of my dissertation is structured in four chapters along the four studies of my research on the economics of individual behavior. In the following, I outline how these four studies are linked, their individual research focuses, and the theoretical approaches to address their specific research questions.

The overall logic of my research is oriented towards the two key elements which need to be analyzed in order to understand an individual's decisions and, as a result, the respective observable behavior. Obviously, the first element is the individual human being with individual socio-demographic characteristics, preferences and underlying predispositions. The second key element is the external framework – more specifically, every parameter with an impact on the set of alternatives (how to

¹ A detailed description of the database can be found in study A below.

decide/behave) or their associated benefits and/or costs. Both elements are linked through the perception of the alternatives' benefits and costs whose difference defines a utility that the individual pursues. More specifically, individual predispositions and preferences affect the perception of benefits and costs and individuals with different socio-demographic characteristics might have different benefits from and costs for the same alternative.

Thus, the underlying concept of my research is that one can understand, and in some cases even predict, individual decisions and the resulting observable behavior, when being able to characterize the individual human person and the external framework clearly. Figure 1 illustrates this concept.

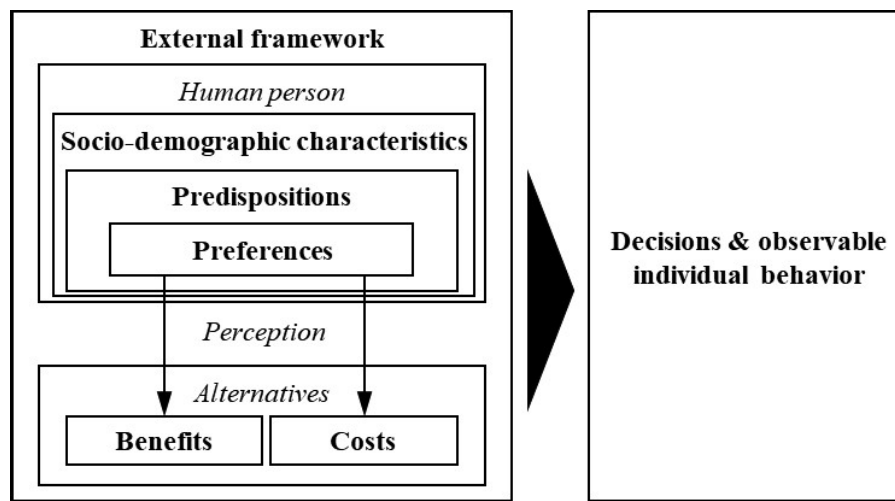


Figure 1: Concept for key parameters to understand individual behavior

The structure of the following four chapters of my dissertation follows this logic. The influence of each element on individual behavior is analyzed by addressing specific research questions in the aforementioned research fields as follows:

Research question (I): *How do differences in socio-cultural capital and socio-demographic characteristics, e.g. gender and a migration background, impact individual study behavior (at comparable levels of human capital)?*

Study A ‘Understanding the impact of gender and migration on high-ability students’ behavior’ is centered around individual socio-demographic characteristics, predispositions and preferences. The effects of differences in socio-cultural capital and socio-demographic characteristics on high-ability students’ behavior are analyzed by looking at the case of the under-representation of women and

migrants in the executive suite of German companies. Human and socio-cultural capital theory serve as the theoretical basis for this study. The differentiating characteristic of this study in comparison to other research in this area is that all students within our sample have a comparable level of human capital. As mentioned above, my co-authors and I could use a sample for our analyses which consists of high-ability students only, i.e. students who have shown excellent performance during their education careers. Thus, we can clearly identify the influence of socio-cultural capital and socio-demographic factors. Our findings are relevant for the ongoing discussion on gender and migration issues in economy and society. Further, we can contribute to existing research on behavioral economics in higher education through a focus on the influence of socio-cultural capital and socio-demographic factors.

Research question (II): *How does a foreseeable change in the external framework conditions, e.g. a change in the study system through the implementation of the Bologna-reforms, influence an individual's study behavior?*

Study B ‘When an exchange semester is no longer enough – Why and how the Bologna-reforms changed the behavior of high-ability students’ is focused on the influence of a foreseeable change in the external framework on individual behavior. In particular, my co-authors and I look at the impact of the Bologna-reforms on the behavior of German high-ability students. We use signaling theory to address this research problem. Furthermore, a human capital theory perspective is discussed. Our findings add to the ongoing discussion amongst academics of how to separate the relative contribution of signaling versus human capital theory to the explanation of such behavioral patterns. In addition, the results of our analyses can help policy makers in education to better estimate the effects of such changes in the education framework as the Bologna-reforms have caused. Finally, also individual students can benefit from our insights on the dynamics of how signals of ability and productivity change over time and under new external circumstances.

Research question (III): *How does an unforeseeable change in the overall external framework conditions, e.g. the change in the economic and labor market conditions during the financial crisis 2008/09, influence an individual's study behavior?*

Study C ‘How talent reacts to crises – The rationality of high-ability graduates’ response to the financial crisis 2008/09’ addresses the influence of *unforeseeable* changes in the external framework on individual behavior. More specifically, my co-author and I explore the reaction of high-ability graduates on the threshold of entering the labor market during the financial crisis 2008/09. In contrast to study B, the changes in the external framework were, in this case, not foreseeable. While the implementation of the Bologna-reforms was planned and concrete measures were transparent, the financial crisis was not foreseeable. Because such large and unforeseeable changes in the external framework occur not infrequently (e.g. the dot-com bubble in the late 1990s or the current Coronavirus pandemic) and often have a severe impact on economies and societies, research on such issues is highly relevant for every practitioner. From a research perspective, we use Smith’s ‘pure’ rational choice theory to discuss our findings. In particular, we evaluate the rationality of our high-ability students’ reactions to the financial crisis. Hence, our findings contribute a perspective on whether the pure rational choice argument is still valid in today’s complex and dynamic environment.

Research question (IV): *What is driving behavior in a completely different environment, i.e. the semi-virtual world of sport-specific social media networks?*

In study D ‘‘If it’s not on Strava, it didn’t happen’ – Identifying user archetypes of sport-specific social media platforms based on motivation and behavior’, I explore behavior in a completely different external environment. I analyze the drivers of motivation and behavior of amateur athletes on sport-specific social media platforms and account for socio-demographic characteristics and personality traits as a means to identify an individual’s predispositions and preferences. The adoption of such platforms and the engagement in such environments in general is increasing rather rapidly. Thus, it is important to understand if and how there are different mechanisms that drive behavior in such environments. More specifically, traditional incentives for a certain behavior, such as monetary benefits, are not existent in this setting and hence, cannot serve to explain a certain behavior. Therefore, I discuss my findings in this study from a relational goods perspective.

Summarizing, each of the four studies addresses one or both of the key elements to understand individual behavior as outlined above. While study A focuses on the influence of individual socio-demographic factors, pre-dispositions and preferences, I explore the effects of (un/foreseeable) changes in the external framework in study B and C. Study D accounts for both individual predispositions and the external framework. As the concrete research problems vary across these studies, different theoretical concepts have been chosen accordingly.

2 Essays on Individual Behavior in Education and Sports

Table 1: Overview of studies of this dissertation

Study # & Short Title	Full title	(Co-)Authors	Scientific dissemination
A – Gender & Migration	Understanding the impact of gender and migration on high-ability students' behavior – Exploring behavioral differences in Business, law, and engineering students throughout their academic careers	Lisa Beck-Werz, Bernd Frick, Thomas Fritz, Fabian Lensing	<i>Ongoing</i>
B – Signaling & The Bologna-reforms	When an exchange semester is no longer enough – Why and how the Bologna-reforms changed the behavior of high-ability students	Bernd Frick, Fabian Lensing, Lisa Beck-Werz	<i>Ongoing</i>
C – Talent & Crises	How talent reacts to crises – The rationality of high-ability graduates' response to the financial crisis 2008/09	Bernd Frick, Fabian Lensing	<i>Ongoing</i>
D – Strava or didn't happen	'If it's not on Strava, it didn't happen' – Identifying user archetypes of sport-specific social media platforms based on motivation and behavior	Fabian Lensing	Presentations at NASPSA ² conference 2021 and Arbeitskreis Sportökonomie Paderborn 2021; <i>Paper publication ongoing</i>

² North American Society for the Psychology of Sport and Physical Activity

3 Conclusion and Outlook

This dissertation contributes new findings on individual behavior in education and sports. On a broad level, the findings of the four studies underline that decisions and the resulting behavior are complex processes which, however, can often be explained, understood and even predicted by using economic theory. The studies show that – if we can identify and parameterize relevant environmental factors and individual predispositions and preferences – we find the expected behavior that economic theory suggests.

In particular, study A reveals the importance of considering differences in socio-cultural capital and socio-demographic factors when analyzing individual behavior. In the case of this study, my co-authors and I explored the effects of gender and migration background on the preferences for certain behavior patterns of high-ability individuals in higher education settings. In our sample of students with comparable levels of human capital, i.e. similar intellectual abilities and previous academic performance, we generally found strong gender effects but only a marginal influence of migration backgrounds. More specifically, our analyses showed that male students more likely choose activities which increase their human capital, such as completing a doctorate, or enhance their business and management skillset, e.g. self-employment during their studies – irrespective of a potential migration background. In contrast, we found that women rather engage in activities that are less associated with a desire to increase one's human capital, for example, working in lower-level auxiliary jobs during their studies.

However, in a certain combination of both factors, namely women with a migration background, the behavior is comparable to that of the male peer group (with or without migration background since there is no significant difference in the behavior amongst male students). These women have most likely already been faced with a large number of 'social barriers' in the past to make it thus far, i.e. being part of our selective sample of high-ability students who received a scholarship. Thus, their behavior could be a result of particularly high levels of aspirations and commitment. One could have also expected that this combination of socio-demographic characteristics, namely women with a migration background, could be a form of 'double

discrimination' as both factors are separately often cited as being disadvantageous in terms of career prospects and education opportunities (see chapter A2). We fail to find evidence for this hypothesis in our sample of high-ability students.

These findings of study A underline the importance of considering individual predispositions and preferences in order to correctly understand individual behavior. The results also show that hypotheses such as the aforementioned double discrimination need to be precisely differentiated for different combinations of socio-demographic and socio-cultural characteristics.

Study B and C extend my research on individual behavior in education as effects of external framework conditions have been focused on in these studies. In particular, in study B my co-authors and I analyzed the effects of a foreseeable change in external framework conditions for students due to the implementation of the Bologna-reforms. In study C, in contrast, we looked at the reaction of high-ability graduates to the unforeseeable financial crisis 2008/09 which impaired labor market conditions for recent graduates severely.

Both studies underline that changes in the external framework conditions are, not surprisingly, associated with a change in the behavior of individuals. Moreover, just as in study A, we saw an impact of socio-demographic characteristics on the specific reactions to the changes. Surprisingly however, my co-authors and I found that our high-ability students reacted rationally to both foreseeable and unforeseeable changes. One could also have hypothesized an irrational reaction, especially to an unforeseeable change like the financial crisis: Such a sudden deterioration of career prospects due to tightened labor market conditions most likely puts additional pressure on graduates on the threshold of entering the labor market. As a consequence, the graduates could lose their clear perspective of alternatives and the expected utility when evaluating and deciding how to react to the crisis.

However, we found a rational reaction by the graduates: The most prevalent reaction was to pursue a doctoral degree instead of entering the tight private labor market during the crisis. Compared to other alternatives, this crisis response minimizes short-term opportunity cost and

improves long-term career prospects by the acquisition of additional human capital and by producing signals of productivity for future employers (a doctoral degree).

In the case of our students' reaction to the foreseeable implementation of the Bologna-reforms, the high-ability students switched to producing new signals of international qualification. More specifically, they increasingly completed degrees abroad since they lost their relative cost advantage for producing alternative signals (e.g. an exchange semester). By completing degrees abroad instead of shorter study stays abroad, they could distinguish themselves from their lower-ability peers and, thus, improve their labor market prospects.

On a broad level, the overarching finding of studies B and C, namely that high-ability students reacted rationally to both the foreseeable and the unforeseeable change in the external framework, confirm Smith's general concept of rational choices (Smith 2010). More specifically, our high-ability students were actually able to identify all relevant environmental factors, including short- and long-term costs and benefits of alternative behaviors in order to determine the most rational reaction for maximizing their utility (i.e. career prospects). As a result, expectations for their observable behavior are confirmed – they act rationally.

In study D, I analyzed the behavior of amateur athletes on sport-specific social media platforms. In contrast to the situation in studies A, B and C, where high-ability students and graduates optimize their behavior towards maximizing their utility in form of their career prospects, there is no such tangible benefit when using sport-specific social media platforms. My analyses reveal that the behavior on such platforms can be explained by looking at other motivational factors beyond the utility of maximizing a tangible net benefit. I found that the behavior is much more driven by the motivation from interpersonal interactions – in line with the argument of the relational goods theory (Uhlener 1989; Donati 2019). Thus, these relational goods represent the utility which defines the rationality of the behavior that is motivated by interpersonal interactions.

However, as the motivational effects of interpersonal interactions vary for different groups of athletes on the platform, the explanatory power of relational goods theory is limited in

this context. Thus, when following rational choice theory, it is to be expected that there are other, unobserved forms of utility for the groups of athletes whose behavior on the platforms is obviously not driven by the utility in form of relational goods. Overall, this underlines that the rationality of the behavior of sport-specific social media users cannot be determined as clearly as it is the case for students who aim for maximizing their utility in form of future career prospects (see studies A, B and C).

Summarizing, the findings of the four studies are in line with the overarching concepts of behavioral economics as we were mostly able to observe the suggested behavioral patterns of rational choice theory. However, especially the findings of study D also show that ‘utility’ which defines the rationality of a certain behavior can take different forms in different situations. The students and graduates in study A, B and C make decisions with the aim to optimize their future career prospects or, more specifically, maximize their future income. In contrast, the athletes which use sport-specific social media platforms derive their utility from relational goods and other, unobserved forms of utility (study D). This shows that my findings are also not inconsistent with Simon’s argument of bounded rationality. I found that individuals make choices that are satisfactory to their respective form of utility within the system, i.e. in my case higher education and sport-specific social media platforms, and according to the available information in the given situation (Simon 1955). Thus, the overall research contribution of this dissertation can be seen in the continuation of the discussions around the applicability and limitations of rational choice theory and bounded rationality.

Moreover, I contribute to the research area of behavioral economics in education by using a large and hitherto inaccessible dataset of high-ability students. This dataset allowed my co-authors and me to differentiate various drivers of the students’ behavior, especially regarding the impact of socio-demographic characteristics. This helps to bring further transparency and provides a fact base for the discussions in today’s society around the effects of gender and migration backgrounds on individual career prospects. These findings will furthermore be relevant to the individual student to better reflect the drivers and estimate the outcomes of their

own behavior. For policy makers in education, knowledge about drivers of individual behavior in their field of influence is also highly relevant. In order to better anticipate the real-life implications of changes in the external framework, such as the Bologna-reforms, they need to understand what drives behavior at the individual level. Future research should build upon these findings and analyze their generalizability to other, non-high-ability students. Emphasis should also be placed on understanding further factors of the external environment (besides policy changes etc.), which have not been focused on in the studies of this dissertation. Especially in the education context, ‘herd’ behavior, i.e. the behavior of the overall student population, could also have strong effects on decisions and behavior at the individual level.

Study D on individual behavior contributes a starting point to better understand individual behavior in very different settings, such as the semi-virtual world. My mixed findings and the complexity of drivers of behavior in these settings underline that this field of research deserves more attention. With the growing number of individuals engaging in these settings, for example, on social media platforms, it becomes more important to understand what forms of utility drive individual behavior in these fields of life.

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