# DFF Research Project 2 description

# Reducing Inequality in Access to Higher Education: An Intervention Study

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**(slightly edited version to account for changes in personnel situation and funding 22.10.2018)**

## 1 Objectives and impact

In Denmark, as in many other countries, there is substantial inequality in access to higher education (Holm et al. 2013). A recent study by Thomsen (2017) revealed that, even among students with above average grades who acquired eligibility for higher education, social background plays a significant role: only 52% of highly performing school-leavers with unskilled parents entered a university programme in the period from 2008-2010, compared with 85% of those whose parents had a university degree.[1] The objective of the project is therefore to develop and test a school-level randomized controlled trial based on a career guidance intervention aimed at reducing social inequality in access to higher education programmes in Denmark. In recent years, experimental studies have been conducted in various countries aimed at reducing barriers in access to higher education. These studies focused on providing students at secondary schools with either better information about labour market prospects for higher education graduates (Barone, Schizzerotto, and Abbiati 2017; Kerr et al. 2014), or better information and practical guidance regarding applying to, costs and financing of higher education (Bettinger et al. 2012; Bird et al. 2017; Oreopoulos and Dunn 2013).

This project goes beyond previous research in several ways. First, few of the previous studies explicitly address other barriers beyond the (potentially false) perception of higher education costs and benefits that might influence students' educational choices. The proposed intervention will address additional barriers related to the expectation of potential academic and social challenges that might prevent less privileged students from choosing university studies. Irrespective of their prior level of academic achievement, less privileged students might be less confident that they can meet the challenge of studying at university (Erikson and Jonsson 1996, p. 52) or "fit in" with the university culture (Reay, Crozier, and Clayton 2010). Second, in contrast to many of the previous studies, which designed their intervention often somewhat ad hoc, the proposed intervention will draw on recent evidence from career guidance research and theory (Hughes et al. 2016) as well as advances in behavioural science related to improving strategies for communicating information regarding college choice (Castleman 2013).

[1] A grade point average of 9 or above on the Danish grading scale (Thomsen 2017, p. 10).

In order to test the effectiveness of the intervention, data from the Danish central admissions agency *den koordinerede tilmelding* (KOT) will be analysed alongside register data on student actual enrolment from Statistics Denmark, which provides student ranked study preferences (up to nine) and final enrolment decisions. Particularly this latter feature of the data will allow to test for intervention effects in a much more comprehensive way than was the case in most previous studies because we will be able to observe whether the intervention simultaneously shifted the combination of study-field (f. ex. Engineering vs. Biology), type of higher education (f.ex. University vs. University College) preferences and whether there are heterogeneous intervention effects across ranked alternatives. Results of the planned intervention will thus create new, relevant knowledge about the factors generating inequality at the transition to higher education. Project results will be relevant at a number of levels: informing educational policy and shaping career guidance practices able to optimize higher education choices and reducing social inequalities in access.

## 2 Theory and state of the art

Sociological scholarship has repeatedly established the centrality of social background on higher education enrolment and attainment (Goldrick-Rab 2007; Stevens, Armstrong, and Arum 2008). While a large body of literature has addressed the different mechanisms through which social background influences higher education choices, sociological rational choice models, in particular, have become an increasingly popular theoretical approach to explain patterns of inequality at the transition to higher education. According to these theories (Breen and Goldthorpe 1997; Erikson and Jonsson 1996; Morgan 2005), individuals from different social backgrounds systematically differ in their evaluation of the costs, benefits and difficulty of different educational alternatives. The theory of relative risk aversion (Breen and Goldthorpe 1997) postulates that all students, and their families, aspire to an educational path leading to an occupational position at or above the level of their parents, regardless of social background. For those with higher class parents, this typically necessitates the choice of university, while for working class offspring other educational routes, might be sufficient to match the occupational status of their parents. Furthermore, differences in the evaluation of higher education costs according to social background might also be related to information deficits regarding financing options (Avery and Kane 2004; Barone et al. 2017; Grodsky and Jones 2007). Differences in the evaluation of likelihood of success in tertiary studies can be attributed to real social background differences in academic achievement at the previous stages of education (Jackson 2013).

Most of the sociological studies studying the mechanism generating inequality at the transition to higher education are based on observational data (Grodsky and Jones 2007; Hillmert and Jacob 2003; Schindler and Reimer 2011; Shavit, Arum, and Gamoran 2007). However, in order to provide more rigorous causal tests of theories on higher education choice, social scientists have increasingly

leaned on experimental interventions. The majority of these relatively recent studies have explored the effects of *information interventions*. These studies can be divided into two strands. The first has tested interventions designed to inform and provide practical guidance to students about issues related to financing or applying to higher education. These studies find that small-scale interventions can increase enrolment or intentions of entering higher education among students from less privileged backgrounds (Bettinger et al. 2012; Bird et al. 2017; Ehlert et al. 2017; Loyalka et al. 2013; Oreopoulos and Dunn 2013). Even relatively small scale measures such as reminders through text-messaging or emails can lead to small but positive effects in terms of increasing access to university in the U.S. context. The other strand has tested interventions designed to inform students about the economic returns to higher education in general and/or the returns to specific fields of studies. Kerr et al. (2014) and McGuigan et al. (2012) report no effects of their interventions, while Barone et al. (2017), Hastings et al. (2015) and Wiswall and Zafar (2013) find that their interventions affected student's choice of study field.

Nevertheless, the emerging experimental literature has a number of shortcomings. Only very few studies have focussed non-monetary factors hindering access to higher education in an experimental setting. However, students from less privileged backgrounds can be expected to be less confident regarding their chances of successfully graduating from university (Erikson and Jonsson 1996; Jackson 2013). Furthermore, research has shown that it might be more difficult for them to navigate life on campus and fit in with the dominant culture at university (Armstrong and Hamilton 2015; Reay et al. 2010). These nonmonetary barriers are particularly relevant in the case of the Scandinavian countries, such as Denmark, where financial aspects might be less relevant given that universal study stipends are provided ("SU"), tuition is free and financial benefits of higher education are comparatively small due to the compression of wages (Landersø and Heckman 2016). Another critical issue in previous studies is that the implementation of the interventions often does not seem to be informed by advances in career counselling and guidance research. The success of an information intervention might not only be the result of the content of the intervention, but also related to the method of communicating the information to prospective students. Research in this field has for example shown students might for example distrust official information sources while experiential events and information provided by friends or peers, so called "warm knowledge" might be seen as more trustworthy (Slack et al. 2012; Smith 2011). It follows that the proposed intervention will draw on insights from career guidance and behavioural science in order to address social or psychological barriers that impede pursuit of higher education among students from less privileged backgrounds.

## 3 Research design

Intervention design (phase A.1): In the first phase of the project, the career guidance intervention will be designed. Targets of the intervention will be students in the final year of upper secondary school. Similar to previous studies, the intervention will consist of an information session, conducted by trained student research assistants and present facts regarding differences in earnings and employment rates by educational level and field in combination with information related to application procedures and the universal student stipends. As far as possible, statistics on earnings and employment of graduates will be personalized to reflect the labour market success of "local graduates" from the respective region the school is located in order to increase the salience of this information (Castleman 2013). The second part of the intervention will be designed to reduce barriers related to the anticipation of potential academic or social difficulties, which can keep students away from higher education. The intervention will be developed in collaboration with the Ministry for Higher Education and Science's seven regional counselling centres ("Studievalg"), as well as with experts at the career services and counselling units at all universities in Denmark. Expert interviews and a survey will be conducted to identify the most crucial issues that keep prospective students from choosing higher education. A close rapport with career guidance professionals will also be necessary in order to avoid redundancies in the intervention in relation to existing information and counselling practices. The second part of the intervention will be implemented by giving students the opportunity to watch video clips of (current) university students providing accounts of their first-hand academic and social experiences, which seems to be preferred by prospective students to information provided by official sources (Dyke, Foskett, and Maringe 2008; Slack et al. 2012). Furthermore, the videos will be customized to explicitly address the academic and social obstacles identified in the expert interview and survey. Instead of showing the same clip to all students, students are free to choose between ca. 8-10 different clips (depending on production costs) so that each student (in the intervention group) can find a field he/she might be interested in and a student there are more likely to identify with in terms of gender and/or field which might increase the appeal of the video-message (White, Hogg, and Terry 2002). Throughout the entire planning and design phase, the project will benefit from the knowledge base of the career guidance research unit at the Danish School of Education (Rie Thomsen) as well as the rich experiences from the Nudge[4] Solution Lab, placed at the University of Virginia (Ben Castleman). The latter collaboration will be particularly useful for implementing a nudging add on to the main intervention. In addition to the main intervention, students will receive a "nudge" in form of text-messages, reminding them of the university application deadlines and providing links to the various online resources. Furthermore, before going in the field, the intervention will be pretested among students from two local universities (Aarhus), followed by qualitative interviews with students to optimize content and delivery of the intervention.

*Implementation (phase B)*: The main intervention will be implemented as a cluster randomized controlled trial (Collins 2009). In order to randomly select intervention and control schools, stratified cluster randomization will be conducted; i.e. all selected upper secondary schools will be divided into strata according to geographical location, school size and sociodemographic composition of the student body. Subsequently, intervention and control schools will be randomly chosen from each stratum. Many U.S. based studies report only small to moderate effects of the various interventions. However, a recent information intervention conducted in Germany, a context more comparable to Denmark than the US, has documented a 12-17% increase in terms of application to university among the less privileged student (Ehlert et al. 2017). We a more moderate minimum detectable effect size of 5,5%, which is yet higher than some of the US-based studies. Based on the STATA program *clustersampsi* (see Hemming and Marsh 2013) 54 schools would be needed in each treatment condition (chosen parameters: increase for the least privileged students from 21-26.5%, $\alpha$ 5%; power 80%; mean N=150, ICC=0.05)[2]. While recruiting 108 schools to participate in the study this is an ambitious goal, the applicant has met with the leader of the counselling center (Studievalg) Ostjylland and corresponded with the Ministry of Education, both of whom expressed great interest in supporting the implementation of the intervention. Approximately one week after the main intervention, a web survey will be conducted at both the intervention and control schools to acquire information on the students immediate post-secondary plans, the level of information they have about the labour market prospects associated with different educational choices, as well as their level of confidence that they could complete various degree programmes. This survey will be crucial in evaluating the internal validity of the main intervention; e.g., to see whether the treated students in fact know more about returns to higher education and are more optimistic regarding their chances to complete higher education. Additionally, the survey will be used to gather information about relevant contextual influences at the school level that could affect higher education choice (see for example Palardy 2015). The survey will also be used in order to implement the text-message nudge. Half of the students in the treatment and control group will be randomly asked to provide their cell-phone number when they fill out the post-intervention survey (see next section). A text-message will then be send to ca. one week prior to the (centralised) application deadline for higher education programs reminding them of the deadline and providing links to various helpful resources related to the application process. Finally, the survey will be enriched by a short survey among principals, designed to gather information about previous career guidance initiatives at the participating schools.

[2] We choose a medium size ICC of 0.05 (see Kul et al. 2014) because students at "Gymnasium" in the Danish education system are more homogenous compared to students at the compulsory level.

*Outcome Analysis (phase C)*: The main outcomes of the intervention will be the students' applications to higher education institutions, using data from the Danish central admissions agency (KOT), and their final enrolment decision, which can be traced through data on student enrolment from Statistics Denmark. Post-secondary intentions, measured one week after the intervention, will be also analysed. Since the intervention might influence enrolment and/or field of study preferences, (Barone et al. 2017; Hastings et al. 2015) both outcomes will be examined. Given successful randomization, estimating the effects of both interventions on students' enrolment decision is straightforward. The randomization ensures that the estimates are not biased due to selection into the treatment conditions.[3] Binary choice regression models with adjusted standard errors for school-clustering will be sufficient to identify treatment effects. Analysing data from the central admissions agency is more complex, since students can list up to eight, hierarchically ordered preferences for specific degree programmes. One way to examine the differences in the overall distribution of applications across programmes between the treatment and control groups and test whether relative proportions of applications in different fields differ significantly between the experimental groups (see Kerr et al. 2014, p. 12). Exploring treatment effects across ranked alternatives is another analytical possibility, since potential intervention effects might affect the second or third ranked less risky "fall-back" choices more than the first listed alternative (see Alon and DiPrete 2015). For all analyses, effect heterogeneity across social background groups will be tested. Furthermore, additional analyses will explore whether social background differences vary by gender, which is particularly relevant for the analysis of the field of study choices (Reimer and Pollak 2017).

## 4 The applicant's qualifications

The applicant has conducted quantitative research about factors related to inequality in access to higher education for more than ten years. As project leader, coordinator, and participant in research projects that have received funding from various funding agencies, the applicant has gained valuable experience in data collection, project leadership, PhD supervision, and the coordination of multinational research teams. With a departmental home at the Danish School of Education and a background as a quantitative sociologist, the applicant draws on insights from both sociology and educational research.

## 5 Project infrastructure, personnel and international outlook

The project will be conducted at the Danish School of Education (DPU), Aarhus University. In terms of personnel, the project team will include PhD student (N.N) and a postdoc position. The postdoc

[3] To not overburden schools, a pre-intervention baseline will not be implemented. A proxy-baseline can be constructed by accessing the schools' previous cohort transition rates through register data.

position will be advertised broadly in all relevant international networks to secure the recruitment of a highly qualified candidate. In addition to the PI, the project team consists of education researchers Rie Thomsen (Danish School of Education) as well as Benjamin Castleman (University of Virginia). Carlo Barone (Science Po, Paris) who has experience with the implementation of intervention studies in the European context, will closely collaborate with the project as visiting researcher.

**Dissemination of results & ethical aspects of the project**

The project team will exploit the rich data generated through the two intervention conditions and the availability of multiple outcomes (intentions, ranked preferences, final enrolment) and publish at least six single and/or co-authored papers in prestigious international journals (such as *American Sociological Review* or *European Sociological Review)* and one PhD thesis. The project team will also plan an international workshop (in 2022) and publish an anthology that will collect intervention findings from different countries. Finally, the project will pay attention to outreach in the form of at least two policy briefs, an informative website and a social media presence to engage researchers, practitioners, and policy makers. Regarding ethical concerns, the project will work with individual level register data and collect survey data. Participation in the surveys will not be mandatory and all data will be handled in accordance with the official guidelines to guarantee the anonymity of respondents. Given the content and nature of the planned intervention, no ethical problems are anticipated.

## 6 References


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