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## Abstract

We analyze in this article to what extent beginning teacher education students at the primary school level differ with respect to previous educational pathways, socio-demographic characteristics, academic self-concepts and occupational motivations. In order to overcome methodological problems of most previous empirical studies on teacher recruitment we draw on data from a recent comparative study on teacher recruitment based on two different samples: In both Denmark and Finland we surveyed a representative group of first year teacher education students as well as last year upper-secondary pupils. The nature of the data collected enables us to characterize teacher education students in contrast to a baseline reference group eligible to apply for teacher education and to compare these differences across countries (difference-in-differences estimation). This analytical strategy allows us to overcome problems of most previous studies that use samples of teacher-education students only in order to characterize teacher education students and to estimate differences between beginning teacher students across countries more reliably. Our results clearly show that Finnish and Danish beginning teacher education students for the primary school level differ markedly with respect to previous academic pathways, academic self-concepts as well as occupational motivations.

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## 1. Introduction<sup>1</sup>

Recruiting able and competent teachers is the goal of most governments and education systems in the world (e.g. OECD 2005). In the Nordic countries, ever since the publication of the results from the Programme for International Student Assessment (PISA) studies by the OECD in the early 2000s, there have been intensive debates about teacher recruitment practices and the content of teacher education. While there are many factors affecting student learning, the way teachers are educated and selected can also be effectively influenced by educational policy. Furthermore, there is a body of research showing sizable teacher effects on student learning (Darling-Hammond 2000; Nye et al. 2004; Rivkin et al. 2005; Wayne & Youngs 2003). Both of these factors might be related to the increasing attention which the issue of teacher recruitment and teacher education has received in the recent literature.

The discussion regarding the selection and education of teachers in the Nordic countries is very much influenced by the success of Finnish pupils in the PISA studies in comparison to their Nordic neighbors. Even though otherwise similar with respect to population size, economic indicators, school spending, welfare state regulations and culture, Finland is consistently atop the different PISA rankings such as average reading, math or science scores. Denmark, in contrast, occupies a place decidedly lower in the rankings, achieving reading, mathematics and science scores at the level of the OECD average or lower (Egelund 2007; Kobarg & Prenzel 2009; Mejdning & Roe 2006). Both, the Finnish success story as well as the disparity between Finland and Denmark and the other Nordic countries have led to numerous scholarly publications exploring the reasons for these findings (Andersen 2010; Hautamäki et al.

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<sup>1</sup> We would like to thank the many people who helped us collect the data in Denmark and Finland. Valuable comments from Martin Neugebauer and Jens Möller are gratefully acknowledged.

2008; Sahlberg 2007). One of the school-related factors differing most markedly between Finland and Denmark is the selectivity and structure and content of teacher education for primary school teachers. In Finland, entry into teacher education programs is highly selective and future primary school teachers are trained at university. In Denmark in contrast, primary teacher education programs admit practically all applicants and training takes place at teacher colleges. Finally, there are also differences with respect to the social status accorded to teacher education in Finland and Denmark (Nordic Council of Ministers 2008).

Against the background of different selectivity, structure and status of teacher education in Denmark and Finland we analyze in this article to what extent beginning teacher education students at the primary school level differ with respect to previous educational pathways, socio-demographic characteristics, self-assessed competencies and occupational motivations. In order to overcome methodological problems of most previous empirical studies on teacher recruitment we draw on data from a recent comparative study on teacher recruitment based on two different samples: In both Denmark and Finland we surveyed a representative group of first year teacher education students as well as last year upper-secondary pupils. The nature of the data collected enables us to characterize teacher education students in contrast to a baseline reference group eligible to apply for teacher education and to compare these differences across countries (difference-in-differences estimation). This analytical strategy allows us to overcome problems of most previous studies that use samples of teacher-education students only in order to characterize teacher education students and to estimate differences between beginning teacher students across countries more reliably. Our results clearly show that Finnish and Danish beginning teacher education students for the primary school level differ markedly with respect to previous academic pathways, academic self-concepts as well as occupational motivations.

The remainder of this article is structured as follows. After a brief discussion of the previous literature on teacher recruitment we lay out some key facts about teacher education and teacher recruitment in Denmark and Finland. In the next section we describe the data from our new study on teacher recruitment in Denmark and Finland and present our analyses. We conclude with a discussion of our key results.

## **2. Literature review**

There are numerous studies that characterize entering teacher candidates and teacher education students with respect to various characteristics such as demographic backgrounds, academic competencies and motivations. Comprehensive reviews by Brookhart and Freeman (1992) and, more recently, Guarino et al. (2006), who summarize research on teacher recruitment from the United States and North America, show that most studies rely on very limited samples and use ex-post facto designs with retrospective questions.<sup>2</sup> Nevertheless, the evidence from these reviews as well as from studies conducted in Australia (Richardson & Watt 2006), Germany (Klusmann et al. 2009) or Switzerland (Denzler & Wolter 2008) suggests that individuals choosing teaching as a career have certain traits in common that transcend regional and national boundaries. It is almost universally established that more women than men enter teaching. Studies that differentiate between different grade-levels of teaching, however, have shown that the proportion of male teacher students increases with higher level grades (Brookhart & Freeman 1992). Furthermore, teacher students typically come from less privileged family backgrounds with respect to parental class or income in comparison to students who pursue

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<sup>2</sup> In Brookhart and Freeman's survey of the literature (1992) only 2 of the 44 studies they reviewed covered more than one campus).

other subjects at the tertiary level (Brookhart & Freeman 1992; Richardson & Watt 2006).

Studies from the United States and Germany show that the average ability of teacher students compares unfavorably with that of students from other educational fields. However, this only holds for those students training to become primary school teachers while no differences seem apparent for teacher students aiming for advanced levels (Guarino et al. 2006; Klusmann et al. 2009).

Overall, only relatively few studies have explored the motivations and aspirations of beginning teacher students. Brookhart and Freeman (1992) categorize the motivations of teacher students into extrinsic, intrinsic and altruistic motives even though studies differ in the way they label these broad dimensions. Richardson and Watt (2006, p. 52) provide a more detailed list of motivations that attract individuals to teaching among them the ability to teach well, the belief that teaching will be intrinsically rewarding, own positive prior learning experiences, job security, as well as the possibility to influence the life of others.

A major part of the literature on teacher recruitment can be characterized as non-theoretical and descriptive. Nevertheless, recent studies in educational psychology apply theories of motivation such as the expectancy-value theory (Eccles & Wigfield 2002; Wigfield & Eccles 2000) to analyze the rationale behind entering teacher education (Pohlmann & Möller 2010; Richardson & Watt 2006; Watt & Richardson 2008). Expectancy-value theory connects choices such as the decision to pursue a teaching career to expectancy-related and task-value beliefs. All choices are assumed to have costs associated with them due to the fact that one career choice does not permit the choice of another. In contrast, studies on teacher recruitment by economists usually frame the decision to enter teaching in a classical supply and demand framework (e.g. Ballou & Podgursky 1995; Dolton 1990; Guarino et al. 2006: 175). On the supply side,

individuals will select teaching if the returns to a teaching job outweigh the possible returns to any other alternative career-path net of the costs of each alternative. The demand for teachers is seen as result of cohort sizes and student enrollment, class sizes, and teaching loads as well as available resources. Finally, Holland's canonical theory of careers (Holland 1966; 1985) offers a third angle to explain teaching as a career choice. According to Holland's theory, individuals choose an academic environment such as teacher education because it is compatible with their respective personality type. Overall, Holland's theory differentiates between six different academic environments and teaching can be characterized as a social environment which focuses on the teaching and helping of others and the acquisition of interpersonal competencies (Porter & Umbach 2006, p. 433).

Our review of the literature revealed no empirical cross-country comparative studies with a focus on teacher students and teacher recruitment. This gap in the literature is surprising in light of the numerous contributions that compare the content and structure of teacher education across nations (e.g. Carlgren et al. 2006; Hudson et al. 2010; Taito 2008) as well as recent attempts to link cross-national variation in working conditions for teachers, such as salaries or teaching loads, to student performance (Dolton & Marcenaro-Guiterrez forthcoming; Woessmann 2003).<sup>3</sup> The current study is thus one of the first attempts to empirically characterize novice teacher students in a comparative perspective and relate them to the different context-conditions in the Danish and Finnish school system.

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<sup>3</sup> The relatively recent TALIS by the OECD which studies a cross section of the teacher workforce in 23 countries is (OECD 2009) is another recent comparative focusing on teachers.

### **3. Teacher education and recruitment in Denmark and Finland**

Recruiting a sufficient number of able teachers has become an increasing concern in Denmark in recent years, where the number of applicants is steadily decreasing (by 33% from 2003 to 2007, e.g. Nordic Council of Ministers 2008, p. 39). At the same time, almost all students who choose teacher education (TE) as a first priority are accepted (97.8% in 2006 and 98.0% in 2007, e.g. Nordic Council of Ministers 2008, p. 39)<sup>4</sup>. Furthermore, compared to the graduating class in upper secondary school, Danish first year teacher students had a lower grade point average ever since the 1970s and this trend has been worsening ever since the 1990s (Andersen & Jespersen 2008). Finland, in contrast, continues to have a high number of applicants and a high level of selectivity into TE only 14% (892 of 6296) were accepted in 2007 (Nordic Council of Ministers 2008). Additionally, the content, and structure of TE also differs markedly between Denmark and Finland. In Finland, TE is a five year Master program that can only be studied at university. In Denmark, teachers are educated at teacher training colleges for the duration of four years and awarded a Vocational Bachelor degree. The Finnish TE is divided into two types: One is a “class teacher” education with a large amount of educational science (pedagogical studies) preparing for teaching in grades 1-6 (or special education), while the other is a subject teacher education with a specialization in one or two school subjects but still including pedagogical studies. Danish TE is an undivided education for teaching in grades 1-9 (10) with a specialization in two or three school subjects. In addition, there are significant differences in the TE curriculum. Finnish TE is ‘research-based’ and there is a larger number of mandatory courses in educational science (pedagogical studies) than in Denmark, where TE is “informed” by research but not research

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<sup>4</sup> More precisely 3479 of 3559 in 2006 and 2896 of 2954 applicants in 2007 were admitted into teacher education in Denmark.

based (Dorf & Rasmussen 2010; Nordic Council of Ministers 2008). Furthermore, teachers enjoy high respect and status in Finnish society (Simola 2005) while Danish teachers, particularly the primary school teachers, are seen very critically in the public eye and are not particularly well respected (Andersen & Jespersen 2008). Finally, the remuneration of teachers in Denmark and Finland is quite similar (OECD 2005, p. 181-182) but the number of teaching hours is a little lower for Danish teachers than for Finnish teachers (Nordic Council of Ministers 2010).

As a result of the various differences in the status and setup of teacher education in Denmark and Finland outlined above, we expect that students who choose and are admitted to TE in Finland should be on average more academically inclined than beginning TE students in Denmark. Our expectations regarding country differences in occupational motivations of beginning teacher students are less clear-cut. The perceived status differences of teacher education and the teaching profession in general between Denmark and Finland might attract more status-driven individuals to teaching in Finland than in Denmark even if the relative income returns to teaching at the primary school level in Denmark are about the same as in Finland. Furthermore, as a result of the higher selectivity and status of teacher education in Finland, we suspect Finnish, in comparison to Danish, students will be less often drawn to teacher education on grounds that they consider it to be an unchallenging or “easy” choice.

#### 4. Data

We draw on data from the teacher recruitment study in Denmark and Finland conducted from fall 2009 until spring 2010. In Denmark and Finland teacher students in their first year as well as last and second to last year upper secondary school pupils were surveyed at a number of strategically selected schools, or teacher training institutions, respectively.<sup>5</sup> After excluding respondents older than 50 as well as those with missing information on the age variable, our sample included 814 Danish / 837 Finnish upper secondary school students and 554 Danish / 587 Finnish beginning teacher training students.<sup>6</sup>

While the realized sample does not constitute a perfect random probability sample of all first year teacher training and last year upper secondary students, the selected schools and universities vary considerably in geographical location and size leading us to believe that results can be cautiously generalized to Finland and Denmark, respectively (see table A1 in the Appendix for an overview of sample sizes and geographic location of selected institutions).<sup>7</sup> Given that Finnish teacher education is comprised of two lines (class teachers and subject teachers) both type of students were included in the sample (e.g. 131 students from Helsinki University preparing to become subject teachers for grades 7-9 are also part of the Finnish teacher-student sample.<sup>8</sup> Questionnaires were administered in paper and pencil format by school

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<sup>5</sup> All upper secondary students in the Danish sample were in the last year of upper secondary school while only 22.1 percent of the students in the Finnish sample (3 out of 10 selected schools) were last year students while the remaining 77.9 percent were second to last year students. This caveat of the sampling does not seem to be very consequential as a comparison of the Finnish pupil across grades along all key indicators analyzed in this paper did not reveal any notable differences between grades (results available on request).

<sup>6</sup> The 87 excluded cases are distributed across the four samples in the following way. Older than 50: DK teacher 18, DK school 0, FI teacher 4, FI school 0. Age missings: DK teacher 7, DK school 22, FI teacher: 13, FI school 23.

<sup>7</sup> One school as well as one university in the Finnish sample are from the Swedish speaking part of Finland (Åbo, respectively) and a Swedish version of the questionnaire was used.

<sup>8</sup> Nevertheless we repeated all key analyses of this paper with and without this sample of subject teachers and results were largely identical (results available on request).

personnel and students were in most cases gathered in an aula for that purpose. In principle, all students from one grade present on the day of the survey participated. The administration of questionnaires at university (FI) or teacher training colleges (DK) was, in most instances, conducted in a mandatory class for all first year students but due to different curricula and dates of the survey this procedure could not be followed at all institutions and questionnaires had to be collected in a range of different classes.<sup>9</sup> Unfortunately it was not possible to compute exact response rates across school or teacher training institutions but given that participation was mandatory we have no reason to suspect systematic nonresponse bias. The school-student and teacher student questionnaires are largely identical and contain questions about educational and occupational plans, educational aspirations, self-assessed competencies as well as socio-demographic background information. Furthermore, the teacher questionnaire contains a section about previous educational pathways and entry requirements into teacher education.

## **5. Analytical strategy**

Below, we compare socio-demographic characteristics, previous pathways, academic skills as well as educational motivations of Danish and Finish beginning teacher students. In order to characterize teachers in Denmark and Finland we always contrast them against the respective baseline sample of upper secondary pupils. Furthermore, we calculate difference-in-differences (DID) estimates across the indicators for self assessment and motivation. For each selected outcome variable ( $Y_i$ ), the DID estimate is calculated in the following way:

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<sup>9</sup> This is the reason for why only very few respondents could be surveyed from the University of Lapland, and the University of Helsinki.

$$E(Y_{jDK\ teacher} - Y_{jDK\ pupil}) - E(Y_{jFI\ teacher} - Y_{jFI\ pupil}) \quad 1.$$

Accordingly, a positive DID estimate indicates that Danish teacher students have a relative advantage compared to Finnish teacher students with respect to the chosen outcome, and *vice versa*. The DID estimate ( $\delta$ ) is calculated in a pooled OLS model as an interaction effect between the type of sample and the country dummy variable which enables us to control for demographic variables (age, gender and ethnicity) that may otherwise confound the estimates:

$$Y_j = \alpha + \beta_{country} + \gamma_{sample} + \delta_{sample*country} + \theta_{controls} + \epsilon \quad 2.$$

This analytical strategy has the advantage that specific country attributes such as an overall high confidence in math skills, will be canceled out and thus not be interpreted as a characteristic of teacher students. Furthermore, country differences in response patterns to specific items due to different connotations or suboptimal translations will also be minimized as these differences should affect pupil and student responses to an equal extent and thus not influence the size of the DID estimate.

## 6. Descriptive overview of the sample

We begin by comparing the educational pathways of beginning teacher students prior to entering teacher education in Denmark and Finland. While a sizable proportion of first year teacher students have either completed or begun but not finished another tertiary or vocational post-secondary study program in Denmark, the corresponding numbers in Finland are much lower.

--Table 1 about here--

Adding up the three types of education above reveals that on the whole 57 per cent (317/554) of all beginning teacher students in Denmark, compared to 24 per cent (141/587)<sup>10</sup> in Finland have either completed or at least begun some other form of postsecondary training before enrolling in teacher education. As can be seen in Table 2, the greater diversity of prior education experiences in Denmark most likely also affects the age distribution of beginning teacher students. The Danish students in our sample are on average about four and a half years older than their Finnish peers.<sup>11</sup>

--Table 2 about here --

The profile of first year teacher students with respect to family background characteristics is quite similar in both countries. The proportion of students who either have a mother or father with a tertiary degree and a father in a privileged (service) class position (e.g. Erikson & Goldthorpe 1992) is about the same among the teacher students and the reference sample of school pupils even if the former is slightly higher among pupils in Denmark.<sup>12</sup> Interestingly, one can observe direct “occupational inheritance” effects in both Denmark and Finland, as the number of students who either have a mother or father who is a teacher is significantly larger among teacher students compared to school pupils in both countries. We also compare the amount of cultural capital (e.g. Bourdieu 1986; DiMaggio 1982) teacher students possess across

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<sup>10</sup> In contrast to the cross-tabulation in table 1 respondents who had a missing value on either one of the items were classified as “not having completed or begun the respective program” for calculation of percentages here.

<sup>11</sup> In order to avoid the loss of too many valid cases due to listwise deletion, a regression based imputation procedure was applied (the “impute” command in STATA 11) and missing values on the variable “cultural capital” (1.83 per cent of all cases), all motivation items in the next section (from .32 to 1.90 per cent of all cases per item), as well as the items used to construct the competency indicators (from 1.00 to 5.41 per cent; one additional item), while the item for the likelihood to finish Sociology or Political Science had more missings and 9.03 of all cases had to be imputed). Predictor variables for the imputation were: age, gender, ethnicity, country and type of sample (pupil vs. teacher).

<sup>12</sup> The lower case numbers for a number of selected variables are due to the fact that part of the survey was conducted as a pilot study within a project commissioned for the Nordic Council of Ministers with a more rudimentary questionnaire that did not contain as many questions about the students’ background (e.g. Petersen et al. 2010).

countries.<sup>13</sup> Not surprisingly, teacher students in Denmark and Finland seem to have substantially more cultural capital than upper secondary pupils even if the disparity between teacher students and pupil is slightly more pronounced in Finland. Finally, the proportion of female beginning teacher students in Finland is larger in Denmark – both in absolute terms and in comparison to the pupil sample, whereas the proportion of students with immigrant background is about the same in both samples across the two countries.<sup>14</sup>

## 6.2 Difference-in-differences estimation

### *Academic self-concepts*

We start by examining country differences in academic self-concepts in three domains – Mathematics, Languages and Social Sciences – that can be seen as very relevant for future primary school teachers. While using the results of test-scores in order to compare academic aptitude across nations would have been preferable, there is abundant empirical evidence showing that academic self-concepts in math and the verbal domain correlate highly with math ability or verbal ability scores measured via tests or teacher ability ratings (for a recent meta analysis see Möller et al. 2009). To measure academic self-concepts we combine two distinct items. The first item represents a rating of one's own competence in the field of math and natural sciences (languages and literature/ society and politics, respectively) on a four point

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<sup>13</sup> The indicator for cultural capital is an index of two items measuring the frequency of opera or theater attendance as well as book reading (from daily to yearly).

<sup>14</sup> Respondents who were either without Danish (Finnish) citizenship, or who come from a family where another language other than Danish (Finnish/Swedish) was/is spoken at home or who indicated themselves that they have an immigrant background were coded into the immigrant background group.

Likert scale.<sup>15</sup> The second item of the index comes from a four point Likert scale where respondents had to rate how certain they are about whether they could successfully complete a degree in math at university (languages or humanities / sociology or political science). While the reliability for mathematics ( $\alpha=.71$ ) and languages ( $\alpha=.58$ ) indices seems to be acceptable, the reliability of the index for the social sciences is low ( $\alpha=.41$ ) indicating that self-concepts this broad academic domain are more difficult to capture.

--Table 3 about here --

Table 3 reports means for all three self-concept measures across samples and countries as well as DID estimates. We hypothesized above that Finnish beginning teacher students would be more academically inclined than their Danish peers. With respect to self-concepts in math and social sciences, DID estimates, net of age, gender and ethnicity, support this claim. The DID estimate for math is highly significant because Danish beginning teachers rate their math competencies well below the reference sample of upper secondary pupils, whereas there is virtually no difference between Finnish pupil and students. Furthermore, Finnish beginning teacher students also seem to be more confident regarding their skills in the domain of social sciences, even though the DID estimate is considerably smaller than in the case of math. No country differences emerge, however, with respect to self-concepts in the language and literature domain.

### *Motivations*

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<sup>15</sup> Even though the Likert items are measured at an ordinal level only, the four available response categories can be considered very symmetrical, which makes the summation and treatment of the items at the interval-level defensible. This also applies to the items used to construct motivation scales in the next section.

In order to compare the occupational motivations of beginning teachers we make use of two item lists in which respondents had to rate how important a specific job characteristic (nine items) and educational program characteristic (thirteen items) is for them on a four point Likert scale (very important to not important at all).<sup>16</sup> A problem with questions of this type is that the responses from first year teacher students might be biased due to “retrospective rationalization”, e.g. students might adapt their responses so they match the choice of the TE program. Given that this possible bias should be just as apparent among Finnish as among Danish teachers, the reported DID estimates should not be affected. After conducting a principal component factor analysis across all items in the pooled sample, we were able to construct four additive scales that measure different general motivations for occupational and educational choices (e.g. Table 4).

--Table 4 about here--

The first scale (seven items, alpha .77) measures status and extrinsic orientation, whereas the second scale mainly captures the valuation of the content and social benefits of an education and or job (seven items, alpha .62). The two remaining scales were labeled “family compatibility” (three items, alpha .53) and “study costs” (alpha .58). In the latter case the label study costs was selected as both items constituting the scale measure academic and actual costs associated with a degree. The correlative structure between the four scales is in line with expectations and indicates good content validity (e.g. Table A2, appendix).<sup>17</sup> Even though the chosen analytical

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<sup>16</sup> The original question wording was the same in the pupil and teacher student questionnaire :“How important are the following aspects of a job for you?” and “How important are the following reasons for choosing an education in your opinion?”.

<sup>17</sup> A comparison of the scale reliability coefficients as well as the correlations of scales between the Danish and Finnish sample was very similar across countries (results not reported but available on request).

strategy did not permit the identification of motivations more focused on teaching (such as “the goal to teach” or “interact with students”), the four scales capture to a large extent the range of motivations to enter teaching identified by the previous literature.

--Table 5 about here--

Table 5 reports average scores on the four motivation scales and DID estimates. Results with respect to the status scale and the scale for educational content/social aspects show a similar pattern. In both Finland and Denmark beginning teachers set less value on extrinsic and status related motives and more value on educational content and social aspects than the reference group of school pupils, respectively. However, due to the fact that Danish teachers set comparatively less value on the extrinsic as well as the educational content/social aspects motives than their Finnish peers, both DID estimates are statistically significant and negative. Results for the two remaining scales reveal the opposite pattern. In Denmark and Finland teachers, in comparison to school pupils, attach less importance to family compatibility and low study costs. Given that the relative difference between Finnish teacher students and school pupil is larger in the Finnish sample, however, both DID estimates are significant and positive. Roughly in line with expectations, the four DID estimates thus reveal that in comparison to Finnish beginning teacher students, Danish teacher students are less status driven, set less value on the educational content/social aspect of their education and future job while family compatibility and study costs are more important to them.

### 6.3 Assessing the relative impact of competencies and motivations

The composition of the population of beginning teachers is the results of individuals' decision to enter teaching in addition to the specific admission process granting access to teacher education. As a consequence, findings such as the ones presented above drawing on a sample of beginning teacher students automatically exclude individuals who wanted to enter teacher education but failed to be admitted. In order to gain a clearer picture of what factors drive eligible students to choose teacher education, irrespective of admission rules, we take advantage of a question in the pupil survey where students had to indicate on a four point Likert scale whether they plan to enter primary school level teacher education.

--Table 6 about here --

Table 6 presents coefficient estimates from an OLS model of the wish to enter teacher education on the self-concept and motivation indicators as well as the socio-demographic background variables.<sup>18</sup> Compared to the DID comparative strategy this analysis allows for an evaluation of the net impact of the different factors related to the decision to enter teaching. The model also contains school-fixed effects to eliminate any characteristic of the sampled schools not captured by the variables in the model.

Interestingly, net of the other variables in the model, self-rated competencies do not affect the propensity to enter teaching in Denmark. In Finland, however, the self-concept index for social sciences has a significant effect. The coefficient estimates for the motivation scales indicate that extrinsic status orientation is negatively associated with wanting to become a teacher in both countries - possibly even more so in Finland than in Denmark. The valuation of

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<sup>18</sup> Given that this item does not have interval-scale level, an Ordered Logistic Regression Model would be more appropriate from a statistical point of view. A comparison of the pattern of results obtained from the presented OLS model in comparison to an Ordered Logit Model did not yield any substantively meaningful difference which is why we present the more accessible OLS estimates.

educational content and social aspects is marginally significant at the ten per cent level in Finland only, and family compatibility as well as the study cost scale are significantly associated (at the five or ten per cent level respectively) with wanting to become a teacher exclusively in Denmark. Finally, the effects of the background variables reveal that a higher level of cultural capital has a positive net effect on wanting to enter teaching in Finland only and having a parent who is a teacher is a significant predictor in both countries under study.

Overall, the size and significance of the coefficients estimated by OLS in the school sample overlap to a large extent with the results from the DID analysis. A lower degree of extrinsic status motivations is associated with wanting to enter teaching – apparently even more so in Denmark than in Finland. The valuation of educational content and social aspects draws pupils to teaching in Finland only while, high family compatibility and low study costs attract school pupil to teaching exclusively in Denmark. The only noteworthy discrepancy between the DID and the regression analysis is the lack of a significant and negative effect of the math scale in the Danish sample, which could have been expected on basis of the DID analysis. Apparently teacher candidates can be characterized by a comparatively lower level of math skills in Denmark but the degree of self-rated math skills, net of motivations and other background factors, does not seem to be significantly associated with the wish to enter or abstain from teaching.

#### 6.4 Results for different sub-samples

In light of the clear pattern of results, we address a number of substantive and methodological concerns of the analysis. A general critique of the literature on teacher recruitment is that

differences between subgroups such as men and women are not sufficiently taken into account (e.g. Brookhart and Freeman 1992). Another potential problem of the DID comparative strategy is that the chosen reference group of all upper secondary pupil, some of whom have no intention of pursuing further education, might not be appropriate. Some might argue that it might be more fitting to characterize entering teaching candidates in comparison to a group of students who also entered higher education but in different fields. To follow up on these concerns we repeat the comparative analysis of competencies and motivations (e.g. Tables 7 and 8) for men and women separately. In addition we also rerun the DID analysis with a more restricted sample of upper secondary pupils as reference group who indicated in a survey question about their post-secondary plans that they plan to enroll in a university or another tertiary institution after graduation (74 % of pupil sample in Denmark ; 68 % in Finland).

--Table 7 about here--

Overall, restricting the baseline sample to university-bound pupils only leads to virtually no change in the DID estimates for neither the self-concept nor the motivation scales (not reported but results available on request). There are some notable gender differences, however. The relative disadvantage of Danish compared to Finnish beginning teacher students with respect to the self concept in math is more pronounced among women than among men. Furthermore, the disadvantage of Danish teacher students with respect to the social science self-concept is significant among men only.

--Table 8 about here --

The results for the motivation scales for each gender do not deviate much from the findings for the entire sample even if some DID estimates are not significant. Only with respect to extrinsic

status orientation do female Danish beginning teacher students seem to be even be even further apart from their Finnish peers than their male peers.

In sum, changing the reference sample to university-bound upper-secondary pupils does not affect the results at all, while the size of some DID coefficients varies according to gender only to a minor degree.

Lastly, we explore how stable the results are if we impose a “Finnish admission regime” on our Danish sample. More specifically we seek to find out whether the differences in academic self-concepts and motivations are only a matter of how selective the admission process is or whether the type of persons entering TE in Denmark are different from her Finnish counterpart other irrespective of admission requirements. For that purpose we restrict the comparative DID analysis to the sample of Danish first year teacher students who were in the top 15% of the grade distribution in the final student-exam.<sup>19</sup> The last rows of Table 7 and 8, respectively, show that DID estimates for the self-concept scales are substantially altered when only the top Danish teacher students are used as a point of reference. These students rate their language abilities comparatively higher than the Finnish teacher students. Furthermore, they seem to have more confidence, in their social sciences skills even though the coefficient does not reach statistical significance ( $t=1.52$ ). Yet they continue to lag behind Finnish students with respect to self-rated math skills even though the DID estimate is not statistically significant from zero anymore ( $t=-1.43$ ). Thus, the math-averse proclivity can also be found when the top Danish teacher students are used as a point of reference. They seem to be more linguistically inclined than the Finnish

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<sup>19</sup> A regression based imputation procedure was again applied and 10.5 percent of the cases on the grade variable were imputed (predictors were the demographic variables as well as the three self-concept scales).

teachers, however. Interestingly, results for the motivation scales are surprisingly unaffected when only the top Danish teacher students are used as reference group.<sup>20</sup>

## **Summary and Discussion**

The findings of this paper clearly show that students entering teacher education in Denmark and Finland differ significantly from each other. In comparison to Finnish first year TE students Danish students are older, have more diverse prior educational experiences and possess less cultural capital. We put more emphasis, however, on the comparison of academic self-concepts as well as occupational motivations. For this purpose differences in self-concepts and occupational motivations between beginning teacher students and a baseline sample of upper secondary school pupils across Denmark and Finland were compared. The difference-in-differences estimates with respect to the three self-concept measures indicate that Danish beginning teacher students lag behind Finnish students in the valuation of their math and social sciences skills. In addition to the differences in self-concepts, the average motivational profiles of Danish and Finnish students differ from each other markedly. Both, Danish and Finnish teacher students put less emphasis on extrinsic status aspects of a job and education than last year upper secondary school pupils do, but this tendency is significantly more pronounced among Danish teachers. Furthermore, the educational content and social aspect of a job are comparatively more valued by the Finnish students while the Danish teachers appreciate higher family compatibility and lower academic study costs comparatively more. This pattern of results

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<sup>20</sup> The results of this simulation are limited insofar as an implementation of the Finnish selection rule in Denmark could also result in changes in the applicant pool, e.g. as a result of a more selective admission different individuals (who are possibly more motivated) would choose to enter TE.

was further consolidated by a number of additional specifications for different subsamples on top of a regression analysis among the sample of school pupil only, which showed that the self-selection into teacher education is a main source of the resulting composition of the student body.

To conclude we discuss whether the observed differences can be related to differences in the quality of the (future) teacher-workforce in Denmark and Finland. Establishing such a connection, however, is difficult for a number of reasons. Firstly, there will be student drop-out on the way to graduation from TE and possibly weaker or unmotivated (Danish) students might not even obtain a degree. Secondly, not all of those who graduate will chose to become teachers or may not be successful in securing a job as a teacher. Thirdly, apart from selection and attrition concerns a core issue is whether the observed differences between Danish and Finnish teacher students are indicative of the quality of teacher they will eventually become. Even though research on teacher effects can demonstrate substantial impact of teachers on student learning, observable teacher characteristics such as age, experience or education usually show no relation to student success (Rivkin et al. 2005). Nevertheless, regarding the observed differences in academic self-concepts, it does not seem too far-fetched to assume that self-concepts might be suggestive of the quality of future instructive behavior, at least in the respective domain. In fact, recent results presented by (2010) show that secondary mathematics teachers' subject knowledge of mathematics has substantial effects on student learning Thus it is not unlikely that the Finnish teacher students might, *ceteris paribus*, become better teachers in Mathematics and possibly Social Sciences also. Furthermore, the notion that the motivation of teachers can explain differences in their instructional behavior is a crucial assumption of psychological motivation theories. "Motivation, as an antecedent of behavior, is assumed to

provide the energy, direction and quality of goal-directed behavior” (c.f. Kunter et al. 2008, p. 470). Thus the fact that Finnish teachers set more value on the content and social aspects of their (future) job and less value on family compatibility and study costs might ultimately also be associated with the quality of their teaching. In contrast, we are more hesitant to suggest a link between the degree of status orientation and quality of teaching. In any case, future research is necessary to establish a link between differentiated motivations and the quality of teaching.

It should also be noted that the results discussed above do not take into account the content of teacher education for student learning. Some claim, that the quality of the curriculum and organization of Finnish teacher education is the source of what makes Finnish teachers “so successful” (Tryggvason 2009). However, even though considerable advances in associating the content of teacher education to student learning have recently been made (e.g. Boyd et al. 2009; Grossman et al. 2010), disentangling the effects of the selection into teacher education from the content of teacher education remains extremely difficult.

To sum up, the study showed that Danish and Finnish beginning teacher students are significantly different from each other. Even if Denmark would try to emulate Finnish teacher education and apply a “Finnish-selection regime”, our comparison of the top 15% of Danish teacher with the entire Finnish teacher sample indicated that significant differences with respect to competencies and motivations in particular may very well persist. It is thus quite possible that in order to attract students who exhibit the same degree of occupational motivation such as the ones in Finland, more measures than raising the admission standards are necessary. Finally, albeit important, teachers and teacher education are of course only one of many factors that influence student learning and any mono-directed reform attempt that ignores these other factors is bound to have limited effects only.

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## Tables

Table 1: Previous educational qualifications of beginning teacher education students in Denmark and Finland

	Denmark			Finland		
	Interrupted	Completed	N	Interrupted	Completed	N
Long Higher Ed.	21.77%	8.62%	441	8.49%	9.78%	542
Short Higher Ed.	15.99%	19.40%	469	7.65%	9.51%	536
Vocational ed.	6.03%	18.10%	431	2.03%	7.20%	542

Source: Teacher-Recruitment Study, own calculations

Table 2: Background and demographic characteristics of beginning teacher education students and upper secondary pupil sample in Denmark and Finland

	DK	DK	Diff	FI	FI	Diff
	Teacher	pupil		Teacher	Pupil	
Parents w. tert. deg	.62	.68	*	.63	.64	ns
Father Service class <sup>a</sup>	.38	.37	ns	.47	.44	ns
Parent a teacher <sup>a</sup>	.18	.12	*	.15	.08	***
Cultural Capital (0-8)	3.10	2.61	***	3.25	2.63	***
Gender = Female	.66	.64	ns	.76	.58	***
Age	28.04	18.59	***	23.39	17.29	***
Migration Backgr.	.08	.07	ns	.03	.04	ns
N	528 (369)	755 (623)		571 (479)	804 (730)	

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Source: Note: Teacher-Recruitment Study, own calculations

Note: <sup>a</sup> Reduced N when these variables are included in sample in parenthesis.

Table 3: Difference-in-differences in academic self-concepts

Sample	Math ( $\alpha = .71$ )	Language ( $\alpha = .58$ )	Social Science ( $\alpha = .41$ )
Denmark			
Teacher	1.91	2.80	2.39
Pupil	2.14	2.80	2.43
Diff	-.23***	.00	-.04
Finland			
Teacher	2.34	2.87	2.31
Pupil	2.28	2.86	2.28
Diff	.06	.01	.03
DID (N=2765)	-0.35***	.04	-.13**

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

Source: Teacher-Recruitment Study, own calculations

Note: DID estimate from pooled OLS model net of age, gender and ethnicity.

Table 4: Overview of four motivation scales

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Scale: Status Orientation/Extrinsic motives ( $\alpha = .77$ )

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Job Motiv: Job Security  
Job Motiv: High Income  
Job Motive: Prestige/Respect  
Job Motive: Career/Lead. pos.  
Educ Motive: Education placed in university environment  
Educ Motive: Educ. High Status  
Educ Motive: Admission difficult

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Scale: Content of Education & Social Aspects ( $\alpha = .62$ )

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Job Motive: People aspect  
Job Motive: Important for society  
Job Motive: Autonomy/judgment  
Job Motive: Interesting/personal develop.  
Educ. Motive: Interesting  
Educ. Motive: Close relations with study peers  
Educ Motive: Many job/educational options  
Educ Motive: Practical  
Educ Motive: Broad knowledge/skills

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Scale: Family Compatibility ( $\alpha = .53$ )

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Job Motive: Family/Other activ.  
Educ Motive: Time for other act.  
Educ Motive: Suppl. work income

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Scale: Study costs ( $\alpha = .58$ )

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Educ Motive: Short duration  
Educ Motive: Easy to complete

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Table 5: Average values across samples and difference-in-differences estimates on motivation scales

Sample	Scale 1 “Status/ Extrinsic”	Scale 2 “Edu. Content/Social”	Scale 3 “Family Compatibility”	Scale 4 “Study Costs”
Denmark				
Teacher	2.19	3.37	3.18	2.12
Pupil	2.57	3.26	3.23	2.22
Diff	-.38***	.11***	-.05	-.10*
Finland				
Teacher	2.58	3.37	3.17	2.17
Pupil	2.69	3.12	3.32	2.43
Diff	-.10***	.25***	-.15***	-.26***
DID (N=2779)	-.29***	-.11***	.15***	0.13*

\* p<.05, \*\* p<.01, \*\*\* p<.001

Note: DID estimate from pooled OLS model net of age, gender and ethnicity.

Table 6: OLS Regression of propensity to enter teacher education in Denmark and Finland (pupil sample)

	Denmark	Finland
Average (1-4)	1.48	1.77
<i>Self-concepts</i>		
Math & Nat.sci	-.03	.01
Language & Lit.	.07	.06
Society & Politics	.06	.16**
<i>Motivations</i>		
Status/Extrinsic	-.26	-.22**
Edu Content/Social	.06	.16+
Family Comp.	.20	.02
Study Costs	.08+	.07
<i>Control Variables</i>		
Cultural Capital	.03	.08**
Parents tertiary educ.	.01	.01
Father service class	-.06	.04
Parent a teacher	.24**	.23*
Female	-.08	.12+
Age	.06+	.10
Immigr. background	.04	-.05
Constant	-.32	-1.16
R <sup>2</sup>	.10	.09
N	642	729

Table 7: Difference-in-differences in self-rated domain competences across different subsamples

Sample	Math	Language	Social Science	N
All	-.35***	.04	-.13**	2765
Women	-.44***	.09	-.09	1787
Men	-.20	-.06	-.20*	978
Top 15% T. DK	-.14	.36***	.12	2304

\* p<.05, \*\* p<.01, \*\*\* p<.001

Note: (same as Table 3)

Table 8: Difference-in-differences estimates for motivations across different subsamples

Sample	Scale 1 “Status/ Extrinsic”	Scale 2 “Edu. Content/Social”	Scale 3 “Family Compatibility”	Scale 4 “Study Costs”	N
All	-.29***	-.11***	.15***	.13*	2779
Women	-.34***	-.11***	.15**	.10	1796
Men	-.19**	-.09	.13	.15	983
Top 15% T. DK	-.31***	-.10*	.18**	.07	2304

\* p<.05, \*\* p<.01, \*\*\* p<.001

Note: (same as Table 3)

## Appendix

Table A1: Location and number of respondents of sampled schools and teacher training institutions

Denmark		Finland	
<i>Upper Sec. Schools</i>	N <sup>a</sup>	<i>Upper Sec. Schools</i>	N
Copenhagen (West)	234	Åbo <sup>b</sup>	78
Haderslev	186	Helsinki	49
Odense <sup>b</sup>	138	Jyväskylä A	68
Rysensteen	164	Jyväskylä B	102
Stovring	114	Jyväskylä C	184
		Riihimäki	67
		Salla	23
		Tampere A	153
		Tampere B	85
		Tampere C	51
Total	836	Total	860
<i>Teacher Training</i>		<i>Teacher Training</i>	
Blaagard	103	Åbo <sup>b</sup>	96
Haderslev	145	Helsinki (1-6)	27
Odense <sup>b</sup>	169	Helsinki 7-9	131
Zahle	162	Jyväskylä	213
		Oulu (1-6)	11
		Tampere	126
Total	579	Total	604

Source: Teacher-Recruitment Study DK/FI

Notes: <sup>b</sup> N refers to all sampled students irrespective of whether they were included in the analytical sample.

<sup>b</sup> These institutions were part of a pilot study which did not contain all items of the main study.

Table A2: Correlations between motivation scales

	index_1	index_2	index_3	index_4
index_1				
index_2	0.178*			
index_3	0.175*	0.193*		
index_4	0.255*	-0.013	0.386*	

