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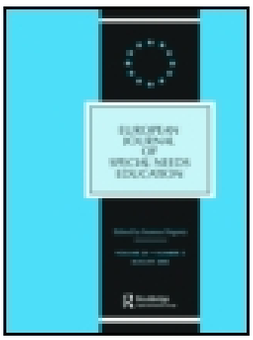

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# Selection for special education services: the role of gender and socio-economic status

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**ABSTRACT**

Children from some demographic groups disproportionately receive special education (SE) services. Due to methodological shortcoming in existing work, it remains unclear whether this is due to real differences in academic needs or cultural selection/bias. Hence, in a community sample of 1250 Norwegian children, we examined the role of third grade SE services, academic test scores, behavioural problems, and teacher's level of helplessness in mediating the effect of family socio-economic status (SES) and students' gender on fifth-grade SE services. Results revealed no direct effects of either gender or SES on fifth-grade SE, but four mediated pathways were identified: (1) Boys had a greater likelihood of receiving fifth-grade SE services when (a) they previously received SE and (b) they experienced more ADHD symptoms, both in third grade. (2) Students from low-SES families were more likely to receive SE services in fifth grade when (a) they performed poorly in math in third grade and (b) their teacher reported greater feelings of helplessness when teaching these students. The findings are discussed with respect to the differential-needs hypothesis, mechanisms of cultural selection and the possibility of gendered selection for SE at younger ages.

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Education; special education; elementary school; disproportionality; selection effects



Special education (SE) is the most important support system for enhancing the learning and development of students who require extra support and services to succeed academically. About 10% of US students and 8% of students in Norway and Finland receive SE services (OECD 2012), involving considerable resources; consider two examples in this regard: $50 billion was spent annually on SE for the schoolyear of 1999-2000 in the US (Parrish et al. 2003) and one-sixth of yearly expenses for compulsory schooling in Norway is expended on SE, equal to $1.1 billion (Norwegian Directorate of Education and Training 2013; Union of Education 2016). Given such expenditures, it is important to ensure that those in need of SE are indeed offered it. It is equally important to ensure that those not in need of SE are not offered it, and to recognise that such students may have other needs that could be better met with different approaches and policies. Previous research indicates that boys, students

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growing up in poverty, and those who are ethnic minorities are disproportionately represented in SE (Banks 2012; Dyson and Gallannaugh 2008; Hibel, Farkas, and Morgan 2010; Hosp and Reschly 2004; Ministry of Education and Research 2011; Skiba et al. 2005; Statistics Finland 2014; Sweller, Graham, and Van Bergen 2012). These observations raise the question of whether SE placement is truly due to students' emotional, behavioural, and/or learning difficulties or whether cultural selection and bias play an influential role in assigning students to SE. Although a few previous studies have addressed this issue (Coutinho and Oswald 2005; Hibel, Farkas, and Morgan 2010; Skiba et al. 2005), the available research is primarily cross-sectional in design and, when longitudinal, lacks information on initial SE. Consequently, it has proven difficult to disentangle the effect of selection for SE from potential effects of these services. The current study notably includes all these design features. Thus, the research presented herein seeks to investigate whether the influences of gender and socio-economic status (SES) on SE are mediated by previous enrolment into SE; children's academic difficulties, including low test scores; and teachers' feelings of helplessness. Toward these ends, this report focuses on Norwegian elementary-school children followed from third- to fifth grade who are participants in a large-scale, community-based, prospective study.

## Mediating mechanisms and disproportionality in SE services

Cross-nationally, boys outnumber girls among SE students (Coutinho and Oswald 2005; Dyson and Gallannaugh 2008; Hibel, Farkas, and Morgan 2010; Nordahl and Sunnevåg 2008), and the same is true for children from low-SES families (Hibel, Farkas, and Morgan 2010; Pihl 2010). This would seem appropriate given that boys have been found to have more mental health problems than girls (e.g. Barkley 2006; Gaub and Carlson 1997; Loeber et al. 2000) and that low-SES students have more emotional and behavioural problems than their high-SES counterparts (Lorant et al. 2003; van Oort et al. 2011). Indeed, children with mental health problems often receive SE services (Knudsmoen et al. 2011; Nordahl and Sunnevåg 2008; Schnoes et al. 2006). Not surprisingly, children with poor school achievement receive SE considerably more often than their better-performing peers (Hibel, Farkas, and Morgan 2010; Sullivan et al. 2009). Based on such findings, the greater prevalence of mental health problems, as well as lower academic achievement among boys and low-SES students, could explain the disproportionality of gender and SES in SE. That is, mental health problems and poor academic achievement may mediate the relationship between gender and SES. Were that the case, SE placement would be less problematic, reflecting the appropriate distribution of resources for such services.

## Disproportionality in SE and problems of cultural selection

Although SE placement is often due to differences in actual needs, some claim that cultural selection bias plays an important role as well (Coutinho and Oswald 2005; Sullivan et al. 2009). This could include bias in referral, assessment, and placement practices or in teacher–student interactions (Coutinho and Oswald 2005; Podell and Soodak 1993; Sullivan et al. 2009). For instance, more boys are judged by their teachers to be less task-focused than girls (Mullola et al. 2012), a behavioural characteristic that increases teachers' likelihood of underestimating students' educational competence (i.e. motivation, maturity, cognitive abilities) (Mullola et al. 2011). Teachers are also more likely to have negative attitudes toward low-SES

children and/or to judge their cognitive abilities less favourably in comparison with high-SES students – a bias that operates even when low- and high-SES students perform equally well or poorly (Auwarter and Aruguete 2008; Ready and Wright 2011; Rist 1970; Sorhagen 2013). Moreover, evidence indicates that low-SES children are more likely to be placed into lower-level ability groups, even when other sociodemographic factors and academic ability are statistically taken into account (Tach and Farkas 2006). These observations imply the obvious: teachers' cultural biases play a major role in SE placement.

Notably, prior research indicates that teachers with limited self-efficacy are more likely to make referrals to SE (Podell and Soodak 1993). Moreover, it is not uncommon for teachers to develop feelings of hopelessness, helplessness, and embarrassment with regard to students who are difficult to discipline and to teach (Friedman 2006). These observations invite the hypothesis evaluated herein that the perceived ineffectiveness of standard teaching, as indexed by teachers' feelings of helplessness, mediates the effects of gender and SES on SE placement over and above other, more objective indicators of need.

Prior work addressing this issue has revealed that boys have an increased probability of receiving SE services even with academic achievement taken into account. In contrast, the influence of SES on SE is attenuated once academic achievement is statistically controlled (Hibel, Farkas, and Morgan 2010; Skiba et al. 2005). Notably, however, these prior works did not consider prior SE, something we do in the present enquiry. After all, as prior SE could influence further selection for SE, failing to consider prior SE could lead to spurious findings.

The fact that ethnic-minority children are also more likely to be placed in SE is of great concern in many countries (Skiba et al. 2005) because this, too, could be the result of cultural selection rather than true academic need. Because the proportion of immigrants from Africa, Asia, Latin America and some parts of Oceania living in Trondheim, Norway, where the current study was conducted, is only 7.6% (Høydahl 2014), it proved impossible to evaluate this possibility with confidence.

## SE in Norway

The Norwegian Education Act § 5-1 (The Norwegian Education Act 1998) states that students who do not or are unable to benefit satisfactorily from standard teaching, meaning the education that all students receive, have the right to SE. Thus, in response to a request from the parent, student, and/or the school, the educational and psychological counselling services will evaluate the student's learning and teaching conditions, resulting in a written report. The municipality, usually represented by the school's principal, then makes an SE-related decision.

In a US context, where most research on disproportionality in SE is carried out, a child needs to be diagnosed with a mental, physical, behavioural, and/or emotional disability that falls within thirteen different categories (e.g. autism spectrum disorder, visual impairment, auditory impairment, emotional disturbance) in order to receive SE services (Individuals with Disabilities Act, IDEA 2004). Consequently, several US studies have addressed the disproportionate placement of children in these predetermined categories regulated by IDEA (Coutinho and Oswald 2005; Shifrer, Muller, and Callahan 2011; Skiba et al. 2005). Given that the present study was conducted in a context different from many studies on disproportionality, the

most appropriate approach here is, therefore, to address selection for SE services as opposed to selection into disability categories.

## The present study

The main aim of the research reported herein was to evaluate two explanations – which are not mutually exclusive – for the disproportionately higher use of SE services by male and low-SES students: the differential-needs and cultural-selection explanations. Toward this end, we draw on a large community study of Norwegian third graders followed up in fifth grade. Support for the differential-needs explanation would be provided by evidence that associations linking child gender and SES with SE are mediated by academic test scores, symptoms of ADHD, oppositional defiant disorder (ODD), conduct disorder (CD) and teacher helplessness in third grade, while accounting for third-grade SE. Support for the cultural-selection explanation would be provided, provisionally, by evidence of the direct effects of gender and SES on SE even when the potential mediators just delineated are taken into account. We say 'provisionally' because we recognise that the potential mediators that are the focus of this enquiry do not exhaust all that could be considered.

## Method

### *Procedure and sample*

The Trondheim Early Secure Study was initiated in 2007, when the participating children were 4 years old. The present work uses data from the third and fourth waves of data collection when the children were eight (third grade) and 10 years old (fifth grade). The 2003 and 2004 birth cohorts and their parents living in Trondheim, Norway, were invited to participate. The children were recruited at the community health check-up for four-year olds, which is a free service for all Norwegian children. A letter of invitation was sent to all parents ($N = 3456$) prior to meeting at the well-child clinic. Of these, 3358 (97%) met at the clinic. At the check-up, they were informed about the study by the health nurse and written consent to participate was obtained. A total of 2475 of 3016 eligible parents consented. To increase variability and thus statistical power, children with emotional or behavioural problems were oversampled. To accomplish this, parents completed the Strengths and Difficulties Questionnaire (SDQ) (Goodman 1997). The SDQ total-difficulties scores were divided into four strata (cut-offs: 0–4, 5–8, 9–11 and 12–40). The drawing probability increased with the SDQ scores of each of the four strata being .37, .48, .70 and .89, respectively. Details concerning the procedure and recruitment are further described in Wichstrøm et al. (2012). A total of 1250 families were randomly drawn to participate, of which 936 (74.9%) were examined at the first wave. Those who dropped out at this point did not vary by SDQ strata ($\chi^2 = 5.70$, df = 3, $p = .13$) or gender ($\chi^2 = .23$, df = 1, $p = .63$). At the second wave two years later, 795 children (50.5% boys) participated in the follow-up assessment. Four and six years later in the third and fourth waves, 699 and 702 children participated, respectively. The sample characteristics are displayed in Table 1. The project was approved by the Regional Committee for Research Ethics, Mid-Norway.

**Table 1.** Sample characteristics ($N = 1250$).

| | Valid $N$[a] | % |
|---|---|---|
| Gender of child | 1232 | 100 |
| Male | 666 | 50 |
| Ethnic origin of biological mother | 793 | 100 |
| Norwegian | 732 | 92.3 |
| Ethnic origin of biological father | 793 | 100 |
| Norwegian | 732 | 92.3 |
| Child care when child was 4–5 years | 1005 | 100 |
| Official daycare centre | 916 | 91.1 |
| Others | 89 | 8.9 |
| Biological parents' marital status at T1 | 529 | 100 |
| Married | 333 | 62.9 |
| Cohabitating > 6 months | 106 | 20.0 |
| Separated | 2 | .4 |
| Divorced | 84 | 15.9 |
| Widowed | 0 | – |
| Cohabitating < 6 months | 3 | .6 |
| Never lived together | 1 | .2 |
| Parental socio-economic status at T1 | 681 | 100 |
| Leader | 144 | 21.1 |
| Professional, higher level | 243 | 35.7 |
| Professional, lower level | 200 | 29.4 |
| Skilled workers | 88 | 12.9 |
| Unskilled workers | 6 | .9 |
| Mother's highest level of completed education at T1 | 659 | 100 |
| Junior high school (10th grade) | 13 | 2.0 |
| Senior high school (13th grade) | 91 | 13.8 |
| Some education after senior high school/or vocational (13th grade) | 66 | 10.0 |
| College degree | 276 | 41.9 |
| University degree | 213 | 32.3 |
| Father's highest level of completed education at T1 | 655 | 100 |
| Junior high school (10th grade) | 30 | 4.6 |
| Senior high school (13th grade) | 86 | 13.1 |
| Some education after senior high school/or vocational (13th grade) | 123 | 18.8 |
| College degree | 202 | 30.8 |
| University degree | 214 | 32.7 |
| Special education at T1 | 1205 | 100 |
| Yes | 58 | 4.8 |
| Yes, male | 38 | 3.2 |
| Special education at T2 | 1165 | 100 |
| Yes | 85 | 7.3 |
| Yes, male | 53 | 4.6 |
| Special education at T1 and T2 | 1250 | 100 |
| Yes | 48 | 3.8 |
| Yes, male | 33 | 2.6 |

Note: T1, third grade; T2, fifth grade.
[a]Note that valid sample size varies according to different time points of data collection.



## Measures

### Demographics

Information on family demographics was obtained by interviewing parents. Child's gender was coded (1) for boy and (2) for girl. Occupational status was coded according to the International Standard Classification of Occupations (International Labour Organization 1991): (1) unskilled workers, (2) farmers/fishermen, (3) skilled workers, (4) lower professionals (5), higher professionals and (6) leaders. SES was operationalised as the higher occupational status of the two parents when there were two parents.

### Academic test scores

The Norwegian Directorate for Education and Training (2008) administers mandatory tests in reading and voluntary tests in numeracy for all Norwegian third-grade students. The third grade reading test has four parts dealing with word chains, fiction and non-fiction reading comprehension, and vocabulary. Sub-test scores for each of these parts were summed to yield a total reading score from 0 to 102. For numeracy, the score range is 0–85. Students who perform below the 20th percentile (i.e. a score of 48 for reading and 52 for numeracy) should be evaluated for extra follow-up. The Trondheim local municipality offices provided test scores for all 1250 children enrolled in the study.

### Teacher-perceived helplessness

Each child's primary teacher completed a questionnaire that included the following question: 'When you teach this student, to what degree do you feel helpless?' Answers were recorded on a five-point scale ranging from (1) not at all to (5) very strongly. Greater teacher-perceived helplessness is associated with reduced feelings of satisfaction and joy when teaching (Kiuru et al. 2015), students' reading disabilities (Kiuru et al. 2013), students' poor academic skills development and peer acceptance (Kiuru et al. 2015), and more student mental-health problems (Silinskas et al. 2015).

### ADHD and ODD/CD

The Child and Adolescent Psychiatric Assessment (CAPA) was used to assess symptoms of ADHD, ODD, and CD. The CAPA is a semistructured diagnostic interview developed for assessing mental disorders according to the Diagnostic and Statistical Manual of Mental Disorders, fourth edition (DSM-IV) (American Psychiatric Association 2000). The child and one parent were interviewed separately. The CAPA contains a structured protocol with mandatory questions and optional follow-up questions. A symptom is considered present if it is reported by either the child or the parent. Interviewers ($n = 7$) were trained by the CAPA team. Blinded raters recoded 15% of the interviews, and the resulting intra-rater reliabilities between multiple raters were ICC = .90 for ADHD, ICC = .90 for ODD, and ICC = .85 for CD.

### Special education

All information regarding SE was recorded by and obtained from the Trondheim local municipality offices. SE was coded as (0) non-recipient or (1) recipient of special education services separately for children's third- and fifth school years.

## Statistical analysis

Preliminary analysis involved correlations among the independent variables. For the primary analyses, multivariate logistic regressions within a structural equation framework were applied to evaluate whether the data supported the differential-needs and/or cultural-selection hypotheses of SE placement. SE in third- and fifth grade was regressed on gender and SES as well as on symptoms of ADHD, ODD/CD, academic test scores and teacher helplessness. The error terms of the potentially mediating mechanisms (i.e. disruptive disorders, academic test scores, teacher helplessness) were allowed to correlate, and these mediating variables were regressed on gender and SES. If the error-term correlations did not reach statistical significance, they were excluded from further analyses. Fifth-grade SE was regressed

on third-grade SE. The Sobel test (Sobel 1982) was used to test for mediating relationships from gender and SES to fifth-grade SE through the putative mediators (i.e. behavioural disorders, academic test scores, teacher helplessness). The differential-needs explanation would be supported if the effects of gender and/or SES on SE in fifth grade were mediated by behavioural disorders, academic test scores, or teacher helplessness. Support for the cultural-selection explanation would emerge if there were direct effects of gender and/or SES that were not mediated by the putative mediators.

As counts of symptoms of ADHD, ODD, and CD are skewed to the right, a robust maximum likelihood estimator was used that does not presuppose multivariate normality and handles moderate deviations from normality well (Benson and Fleishman 1994). Due to the stratification, population weights were applied, with weights proportional to the number of children in the population in a specific stratum divided by the number of participating children in that stratum. Attrition at T2 was not selective according to the study variables, except that higher levels of teacher helplessness in third grade predicted attrition in fifth grade (odds ratio = 2.11; 95% confidence interval [CI]: 1.10–4.05, $p = .01$). Missing data were handled according to a full information maximum likelihood procedure. Analyses were performed in Mplus 7.3 (Muthén and Muthén 1998–2015).

## Results

### Descriptive findings

Table 2 indicates that girls performed better in reading and boys experienced more symptoms of ADHD and ODD/CD. Students from higher-SES families performed better in reading and math and had fewer symptoms of ADHD, and their teachers were less likely to experience helplessness.

### Differential needs versus cultural selection

The unstandardised regression coefficients resulting from the mediational analyses are presented in Figure 1. In line with the data in Table 2, poorer math scores, greater teacher helplessness, and symptoms of ADHD predicted SE placement at T2, even when SE at T1 was controlled. Gender and SES exerted no direct effects on SE at fifth grade when all mediating pathways were included.

However, as shown in Figure 1, higher-SES predicted higher test scores, less helplessness, and fewer symptoms of ADHD when the other mediators (i.e. test scores, symptoms of

**Table 2.** Pearsons correlation coefficients for the independent variables.

| | Measure | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| 1. | Gender (C) | – | | | | | |
| 2. | SES (P) | –.05 | – | | | | |
| 3. | Reading test scores (C) | .10* | .17*** | – | | | |
| 4. | Math test scores (C) | –.07 | .13** | .57*** | – | | |
| 5. | Helplessness (T) | –.07 | –.16*** | –.21*** | –.34*** | – | |
| 6. | ADHD (C) | –.14*** | –.09* | –.24*** | –.31*** | .36*** | – |
| 7. | ODD/CD (C) | –.18*** | –.03 | –.11* | –.18** | .20*** | .38*** |

Note: C = child, T = Teacher, P = Parent. Gender is coded 1 = boy, 2 = girl.
*$p < .05$; **$p < .01$; ***$p < .001$.

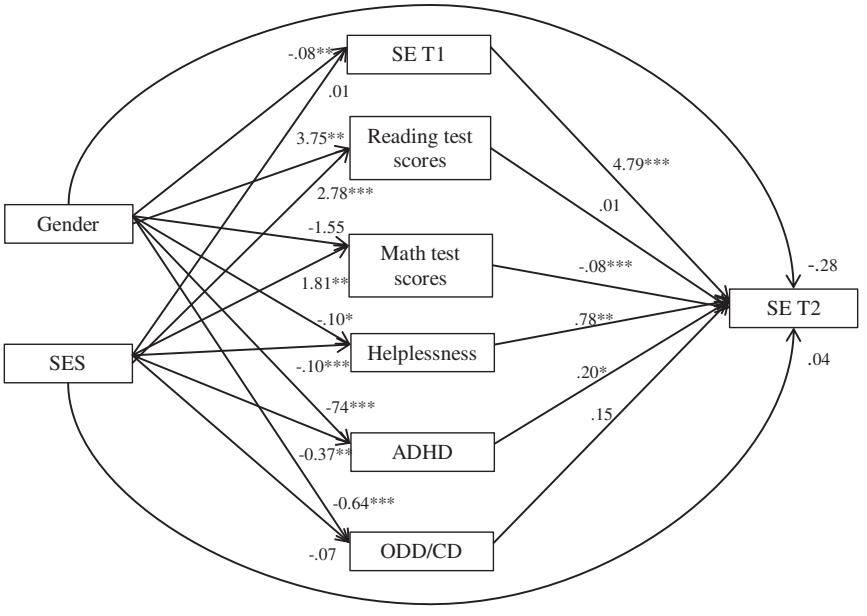


**Figure 1.** Results from the structural equation model.
Notes: All estimates are unstandardized. *$p < .05$, **$p < .01$, ***$p < .001$.

**Table 3.** Results from structural equation modelling of the indirect effect of gender and parent socio-economic status (SES) on fifth-grade special education (SE T2).

| | Coefficients B | 95% CI | *p*-value |
|---|---|---|---|
| Indirect effects | | | |
| Gender → SE T1 → SE T2 | –.41 | –.73 to –.09 | .013 |
| Gender → Teacher helplessness → SE T2 | –.08 | –.17 to .01 | .085 |
| Gender → ADHD → SE T2 | –.15 | –.27 to –.02 | .029 |
| SES → Math test score → SE T2 | –.14 | –.27 to –.02 | .027 |
| SES → Teacher helplessness → SE T2 | –.08 | –.14 to –.02 | .013 |
| SES → ADHD → SE T2 | –.05 | –.10 to >.00 | .062 |

Note: All estimates are unstandardized.

disruptive disorders, and teacher helplessness) were controlled. Furthermore, more boys than girls received SE in third grade, performed more poorly on their third-grade reading tests, had more symptoms of ADHD and ODD/CD, and were more likely to have teachers who felt helpless.

In consequence, several mediated effects emerged (Table 3). First, being a boy increased a student's chances of receiving SE in fifth grade through the increased probability of SE in third grade and more symptoms of ADHD. Second, children from low-SES families had a higher probability of receiving SE in fifth grade through lower third-grade math-test scores and greater teacher helplessness. In summary, the statistical results supported the differential-needs hypothesis for SE placement in fifth grade, as the effect of SES on fifth-grade SE was mediated by the students' math-test scores and the teachers' experience of helplessness in third grade, in addition to the effect of gender on SE in fifth grade through symptoms of ADHD. Despite such support for the differential-needs hypothesis, the fact that boys were

more likely to receive SE in third grade, which in turn increased the probability of continued SE in fifth grade, is consistent with the gender-based, cultural-selection hypothesis, as least to the extent that this research was able to discount differential-needs' mediational processes.

## Discussion

We used a large-scale, community-based prospective study to evaluate two alternative but not mutually exclusive explanations for the disproportionately higher use of SE services by boys and low-SES students, the differential-needs and cultural-selection hypotheses. Results revealed that the effects of SES and gender on fifth-grade SE operated via ADHD, math ability, and teacher helplessness, thus proving consistent with differential needs. Moreover, because there were no direct effects of gender and SES on fifth-grade SE when mediating mechanisms were adjusted for, the results might first appear to be inconsistent with cultural selection. However, because boys more often received SE in third grade, and this continued in fifth-grade SE, we cannot discount the cultural-selection explanation for SE at earlier ages. The fact, however, that mediating processes reflective of differential needs but not included in this research could be operative means that support for the cultural-selection hypothesis must be regarded as provisional.

### *Differential needs supported*

Evidence of multiple mediational paths provides support for the differential-needs perspective. First, more boys than girls experienced symptoms of ADHD, which in turn increased their chances of receiving SE services in fifth grade. These results are in line with evidence that ADHD is more prevalent among boys (Barkley 2006; Gaub and Carlson 1997; Sandberg 2002) and is known to impede learning (DuPaul and Stoner 2014). Second, we found that students from low-SES families were more likely to receive SE in fifth grade due to poorer math performance in third grade. To our knowledge, this is the first formal test of the mediational influence of academic performance vis-à-vis SES and SE, despite being repeatedly hypothesised (Hibel, Farkas, and Morgan 2010; Hosp and Reschly 2004). Nonetheless, several studies have documented, separately, the two paths in this mediational process (Aikens and Barbarin 2008; Barr 2015; Hibel, Farkas, and Morgan 2010; Manning and Patterson 2003; Morgan 2009; Pokropek, Borgonovi, and Jakubowski 2015; Sullivan et al. 2009).

### *Cultural selection*

Given prior evidence that boys and children from low-SES families are disproportionately likely to receive SE services (Coutinho and Oswald 2005; Dyson and Gallannaugh 2008; Hibel, Farkas, and Morgan 2010; Nordahl and Sunnevåg 2008; Pihl 2010), it is noteworthy that the effect of gender on SE placement remained. However, when studies have addressed questions of why that is, the effect of gender but not SES seems to persist, even when academic performance and children's difficulties are taken into account (Hibel, Farkas, and Morgan 2010). We also find boys and children of low-SES families to be overrepresented in SE. Notably, though, no direct effect of gender (or SES) emerged after

accounting for child difficulties, academic performance, and the teacher's helplessness.

This difference between our study and others could be due to the fact that most such investigations of selection effects have been conducted in the US (Coutinho and Oswald 2005; Hibel, Farkas, and Morgan 2010; Oswald et al. 2003; Skiba et al. 2005). Consequently, the influence of gender on selection for SE services could be operative in some contexts but not in others. This may be especially, true since nations' educational systems differ along with the organisation of SE services. Differences in criteria for who is eligible for SE have been the focus of general discussions of disproportionality (Triano 2000). In some nations, a child must have a diagnosis to be eligible for SE services (e.g. the US and Australia). To ensure equity in SE based on such formal requirements may be challenging since selection bias on gender differences in the diagnosis of mental health problems or placement in disability categories has been detected (Coutinho and Oswald 2005; Forness et al. 2012). In other nations, students who do not benefit from standard teaching methods are given SE services (e.g. Norway and the UK). As this study did not examine selection for SE across nations, we are not able to thoroughly address possible differences in mechanisms. Nevertheless, we contend that in societies in which SE eligibility is based on the student's expected educational benefits from standard methods of education, enrolment in SE could benefit students who actually need it (Dyson and Gallannaugh 2008). Consequently, gender could have less influence on SE selection in such contexts.

Although there was no additional cultural selection based on gender from third- to fifth grade, we detected such an effect in third grade, and this was so even with concurrent ADHD, behavioural problems, test scores, and teacher helplessness taken into account (i.e. statistically controlled).

Table 1 indicates that 83% of students who received SE services at T1 continued to receive them at T2. As we controlled for SE at T1, selection for fifth-grade SE is mainly based on new cases, leading us to speculate that early but not later gendered selection may be occuring. Gender differences in at least ADHD and severe behavioural problems (Wichstrøm et al. 2012), language development (between the ages of 6 and 8 years) (Bornstein, Hahn, and Maurice Haynes 2004), and academic acheivements (Hyde 2005) are weak or nonexistent during the early childhood years. Although we cannot discount the possibility that the preponderance of boys in SE in grade 3 was due to prior gender differences in the above difficulties that were not carried forward into grade 3, the modest magnitude of earlier gender differences makes this explanation doubtful. Therefore, we speculate that early gender differences in other areas, such as temperament, cognitive abilities, motivation, might be involved.

Same-age boys and girls differ in temperament (Else-Quest et al. 2006); notable in this regard is that boys display more surgency and less effortful control than girls (Else-Quest et al. 2006). Girls are also generally less easily distracted across childhood (Murphy et al. 1999). However, boys exhibit a greater *change* in attention shifting at some periods of their development (Murphy et al. 1999). That is, between the age of 8–10 and 10–12 years, boys increase their ability to shift their attention from distracting thoughts (attention shifting), which levels off after this four-year period. Furthermore, younger girls find school-related tasks such as mathematics and language to be more valuable and fun compared to boys of the same age (Kenney-Benson et al. 2006). This gender difference in task value decreases in fifth grade (Kenney-Benson et al. 2006).

Given the above findings, eight-year-old boys (third graders) are likely to be more active, more easily distracted, and less motivated about school-related tasks than their female peers and older boys. These differences may make it particularly difficult for some eight-year-old boys to adapt to the demands of the traditional school setting (i.e. sitting still, on-task behaviour), thereby resulting in their disproportionate placement in SE, a process that may be attenuated as they age.

Finally, low-SES students were also more likely to receive SE in fifth grade, possibly as a result of teachers' feelings of helplessness. This result, intriguingly, raises the issue of cultural selection. After all, if it is not achievement difficulties that are making teachers feel helpless, could it be an implicit or unconscious bias regarding the capabilities of students from low-income families? Obviously, we cannot rule this explanation in or out, but it would be worth exploring in future work, perhaps by means of methods used routinely for measuring implicit bias (Sabin and Greenwald 2012).

### *Limitations*

The number of children receiving SE was relatively small in our community sample, and therefore, we might not have been well positioned to detect some associations. Relatedly, it is possible that the risk of SE is particularly increased among those with many disadvantages (i.e. intersectionality; Strand 2014a, 2014b). However, this would imply testing interactions between risk factors, which the present sample size did not allow for, power wise. Additionally, despite uniform regulations for SE services within a region, selection mechanisms may differ across schools (Farkas, Sheehan, and Grobe 1990; Hibel, Farkas, and Morgan 2010). A larger proportion of SE students in our sample might have allowed for comparisons across schools or school districts. Boys were more likely to receive SE services in third grade, while controlling for child difficulties. At present, we do not know whether this is unique for third grade or if the gendered selection is present at earlier grades. Further studies should aim at addressing this issue, starting at even earlier grades.

Any generalisation of our results beyond the situation of SE in Trondheim, Norway, should be done cautiously. This is due to differences across nations, such as legal regulations and practices of SE and educational systems (Norwich 2007 and differences in attitudes of parents and teachers (Avramidis and Norwich 2002; de Boer, Pijl, and Minnaert 2010; Ghanizadeh, Bahredar, and Moeini 2006).

## Conclusions

Although boys and low-SES students are more likely to receive SE services in fifth grade in our sample, this was fully mediated by previous ADHD symptoms, more-limited math ability, and greater teacher helplessness. Such findings are generally in line with a differential-needs account of SE placement. However, boys more often received SE services in third grade even when their greater needs were accounted for, and this gendered selection persisted into fifth-grade SE due to the continuation of SE from third- to fifth grade; this result would seem consistent with the cultural-selection explanation, although this claim must, again, be qualified by the fact that there were no doubt mediating, differential-need mechanisms that could not be considered in this enquiry. Hence, although differential needs explain new

cases of SE in middle childhood, cultural selection might be present during elementary school and carried forward into middle school.

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No potential conflict of interest was reported by the authors.

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