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To cite this article: Ed Smeets & Jaap Roeleveld (2016) The identification by teachers of special educational needs in primary school pupils and factors associated with referral to special education, European Journal of Special Needs Education, 31:4, 423-439, DOI: [10.1080/08856257.2016.1187879](https://doi.org/10.1080/08856257.2016.1187879)

To link to this article: <https://doi.org/10.1080/08856257.2016.1187879>



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Published online: 30 May 2016.



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The identification by teachers of special educational needs in primary school pupils and factors associated with referral to special education

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ABSTRACT

This paper addresses the identification of pupils with special educational needs (SEN) in mainstream primary schools by their teachers. Data were analysed from two consecutive measurement occasions of a large cohort study in the Netherlands. The types and severity of pupils' problems, and their school careers were studied. Around 25% of the pupils were considered by their teachers to have SEN. Results show that a substantial percentage of pupils who had been identified with SEN at the first measurement occasion were not identified with SEN three years later, whereas the same percentage had not been identified with SEN at the first occasion but was at the second occasion. Significant predictors of being identified with SEN include results from skills tests, and the teacher's views on the pupil performing below expectations, having a less favourable attitude to work, being less popular with classmates, and being more dependent on the teacher. In addition, boys are more likely to be identified with SEN in comparison to girls. Cognitive impairment and/or delayed cognitive development proved to be the most influential predictor of referral to special education. In addition, chances of a pupil being referred to special education are influenced by several other pupil characteristics. Implications of these outcomes are discussed.

ARTICLE HISTORY

Received 17 July 2015

Accepted 26 April 2016

KEYWORDS

Special educational needs; mainstream schools; primary education

Introduction

Throughout Europe, ongoing efforts are made to increase the proportion of pupils with special educational needs (SEN) that can be accommodated for in mainstream schools, subsequently decreasing referral to special education. However, pupils with SEN do not form a clearly defined group (Pijl, Frostad, and Flem 2008). The process of identifying and supporting pupils with SEN can be understood in terms of three different overlapping models: a pedagogical model related to knowledge goals, a social model related to the pupil's social situation and adjustment in school, and a medical model related to the pupil's health (Isaksson, Lindqvist, and Bergström 2010). As a result of differences in policy and allocation of resources, percentages of pupils who are entitled to additional funding to cater for their special needs

differ considerably between countries, although a common factor is that most systems mainly rely on the medical model in order to identify these pupils (Desforges and Lindsay 2010; Ferguson 2008). Norwich and Lewis (2001) pointed out that pupils with SEN cannot be considered to be part of a specific subgroup, since there is a range of pupils along continua of attainment and cognitive abilities, which calls for continua of teaching or pedagogic approaches. Desforges and Lindsay (2010) recommended that assessment of SEN should be an on-going process which is closely linked to intervention, and it should be an integral part of the cycle of assessment, planning, teaching and reassessment.

As a result of ongoing practices with respect to the allocation of budgets to pupils with SEN, there is a substantial group of pupils in mainstream schools who do not meet official criteria and who have not been diagnosed as having a disorder, but who do require additional attention and support. The decision about who fits into this group is usually made by the teacher. Teacher-identified pupils with SEN form a heterogeneous group with a spectrum of needs and large individual differences in performance (Bruggink, Goei, and Koot 2013). Knight (1999) found that on average 20% of students in mainstream schools require special attention, without having a diagnosed disability or problem. A large-scale study in the Netherlands showed that according to primary school teachers, on average 26% of the pupils in their classes have SEN (Van der Veen, Smeets, and Derriks 2010). In an earlier study in the United Kingdom, a similar percentage had been found (Croll and Moses 2003). According to Keslair and McNally (2009) about one-fifth of English school children are identified by their schools or by local authorities as having some form of SEN. This is confirmed by Crawford and Vignoles (2010), who stress that the proportion of pupils with SEN peaks among nine-year olds, at over 25%. In another study, 15% from a sample of 2509 children at the age of 10 in primary schools in England were identified by their teachers as showing SEN in relation to either reading (12%), or number work (11%) or both areas (8%). These teacher ratings were confirmed by the children's attainment outcomes (Anders et al. 2011). In addition, studies show that percentages of pupils who are considered to be designated with SEN vary considerably between teachers (Croll and Moses 2003; Van der Veen, Smeets, and Derriks 2010).

The most common problems of pupils with SEN as estimated by teachers in primary schools in the Netherlands are lagging behind in literacy and/or numeracy and having a problematic attitude to work (Van der Veen, Smeets, and Derriks 2010). These authors also concluded that whether or not SEN are recognised by the teacher may depend upon contextual factors, for example the education level of parents or the number of pupils with SEN in class. As a result of this, special needs of children may not always be catered for. Isaksson, Lindqvist, and Bergström (2010) concluded that school personnel did not find it easy to sort out and assess SEN. Banks, Shevlin, and McCoy (2012) pointed out that teachers over-identify certain groups of students. These authors found that boys are significantly more likely to be identified with emotional and behavioural disorders (EBD) than girls. In addition, children from economically inactive households and children from one-parent households are more likely to be identified with EBD than their peers, all else being equal. The authors pointed out that this may lead to lowered expectations, with implications for school engagement and attainment. Apart from this, the authors concluded that teacher judgment in the identification of pupils with SEN is influenced by the social mix of the other students in the class or school. Their outcomes are based on analyses of a cohort study in Ireland which included 8578 children at the age of nine, 3.6% of whom had been identified with EBD by their teacher. Based on the same data, McCoy, Banks, and Shevlin (2012) concluded that teachers in

disadvantaged schools appear to under-identify children with learning disabilities, whereas they are far more likely to identify students with EBD. Anders et al. (2011) also concluded that teachers' judgments of SEN are influenced by other factors, in addition to children's attainment levels. For example, boys were more likely to be identified as showing SEN in relation to reading and children whose month of birth was later in the academic year were more likely to be identified as showing SEN in relation to reading as well as number work. In another study, it was found that teachers rated the social competences as well as the pro-social behaviour of non-SEN students as more positive than the competences of students with SEN (Schwab et al. 2014). However, Bruggink, Goei, and Koot (2016) found no significant relationship between teachers' perceptions of students' additional support needs and the teachers' self-efficacy beliefs and personality traits. Hence, the authors concluded their study found no evidence to question the objectivity of teachers' perceptions of students' needs.

Some of the pupils who have been designated by their teachers as having SEN are at some point in their school career referred to special education. Van der Veen, Smeets, and Derriks (2010) analysed characteristics of primary school pupils for whom a procedure had been started to place the pupil in a special school. Students with intellectual impairment were three times more likely to be involved in a referral procedure as compared to pupils with SEN who did not have intellectual impairment. Pupils with autistic spectrum disorder (ASD) were two times more likely to be referred to special education than pupils with SEN who had not been diagnosed with ASD. Exhibiting externalising problem behaviour increased the likelihood of being referred to special education 1.7 times. Lower attainment in literacy and numeracy was significantly associated with higher chances of being referred to special education, as well. Pupils who were older than their classmates and pupils with parents who had only attended primary school or junior secondary vocational education were more likely to be referred. In addition, boys were more likely to be referred to special education than girls.

Focus on educating pupils with SEN is embedded in the curriculum of initial teacher training in the Netherlands. Primary school teachers are educated at higher education institutions and gain a bachelor's degree. Schram, Van der Meer, and Van Os (2013) found that teacher trainers' views on the types and extent of SEN student teachers should be prepared for differ from institution to institution, and it is difficult to make an adequate comparison of curricula from various teacher training institutions. Usually, the topic of educating pupils with SEN is addressed in several courses, including courses of pedagogy, mother tongue, and arithmetic. In addition, academic minors are available, mostly in the third year. In most cases, these are optional. Almost all teacher trainers who participated in the study of Schram et al. (ibid.) stated that student teachers are sufficiently prepared during initial teacher training for educating pupils with SEN, although 27% felt that student teachers are not sufficiently prepared for dealing with behavioural difficulties. However, Pijl (2010) contended that it is an illusion to think that initial teacher training can prepare teachers for educating a wide range of students with special needs. In addition, continuing professional development (CPD) with respect to educating pupils with SEN is available to in-service teachers. In a recent study, 50% of primary school teachers who completed a survey indicated that they had recently participated in some kind of CPD activity on this topic, mostly comprising a workshop or a course (Smeets et al. 2015). During classroom observations, inspectors from the Inspectorate of Schools in the Netherlands focus on basic as well as advanced teacher competences. The latter are needed to be able to provide education that is tailored to the needs

of SEN pupils. According to the Inspectorate only 37% of teachers in primary schools hold basic as well as advanced competences to a sufficient extent (Inspectie van het onderwijs 2013).

In summary, the conclusion from studies that have been carried out in the past is that the judgment of pupils having SEN may vary from teacher to teacher, that teachers' attitudes can play a significant role in this process, and that certain pupil groups tend to be over-identified with SEN. In addition, it is questionable whether teachers are sufficiently prepared to provide SEN pupils with optimum education. The goal of the present study is to provide more insight into the underlying mechanisms of the identification process, the stability of the 'SEN label' over time and the relation of the likelihood of being identified with SEN with pupil and school characteristics.

Research questions

In the present study, four research questions were addressed:

- (1) What proportion of pupils in mainstream primary schools in the Netherlands have SEN according to their teachers and what is the nature and severity of problems or disorders of these pupils in the opinion of their teachers?
- (2) Which variables at pupil level and at school level are significant predictors of pupils being identified with SEN?
- (3) How stable is the identification of SEN within a pupil by teachers over a three-year interval?
- (4) Which variables are significant predictors of the referral to special education of pupils who have been identified with SEN?

Method

Definition of SEN

No official definition of SEN is provided in policy documents in the Netherlands. For the purposes of this study, a pupil with SEN was defined as a pupil:

- for whom there is an individual education plan; and/or;
- for whom a specific approach or extra help is needed; and/or;
- who has a specific problem or learning difficulty.

This definition has previously been used in the study by Van der Veen, Smeets, and Derriks (2010). The goal is to acquire information about the pupils who are considered by their teachers to require some kind of additional or special support.

Procedure and sample

Cross sectional and longitudinal data were available from two consecutive measurement occasions of the cohort study COOL⁵⁻¹⁸ in the Netherlands. Data were gathered in 2008 and 2011, respectively, by administering surveys to teachers and by collecting results from achievement tests completed by pupils. The 2008 sample (COOL-1) comprised data from

550 mainstream primary schools, including a reference sample of 400 schools and an additional sample of schools with a comparatively large proportion of pupils from disadvantaged groups. Whether a pupil is part of a disadvantaged group depends upon the education level of the pupil’s parents. The 2011 sample (COOL-2) included 553 schools, 406 of which were part of the reference sample. In the present study, data were analysed from 19,373 pupils in COOL-1 and 23,819 pupils in COOL-2 (see Figure 1). The sample consists of pupils from grades 2, 5 and 8. These are pupils aged about 5, 8 and 11 years, respectively. Grade 8 is the highest grade in primary school in the Netherlands.

Longitudinal data were available from pupils in COOL-2 who had also participated in COOL-1. Part of the sample had dropped out of the cohort for various reasons. Firstly, 208 schools that had participated in the first measurement occasion had opted out of the study. As a result of this, part of the original sample was replaced by other schools. Secondly, because the sample did not involve all grades, pupils who had been retained after the first measurement occasion did not take part in the second measurement occasion. Thirdly, some of the pupils had dropped out of the cohort because they had left the school in question, e.g., because they had moved or because they had been referred to special education. Information from both measurement occasions about whether the respective pupils had been identified with SEN by the teacher or were considered to have no SEN was available with 4467 pupils. These pupils were in grades 2 and 5, respectively when COOL-1 data were collected and in grades 5 and 8, respectively, during the COOL-2 data collection (see Figure 1). Additional information about the school careers of the pupils dropping out of the cohort has been collected by retrieving data from the Central Bureau of Statistics (Statistics Netherlands).

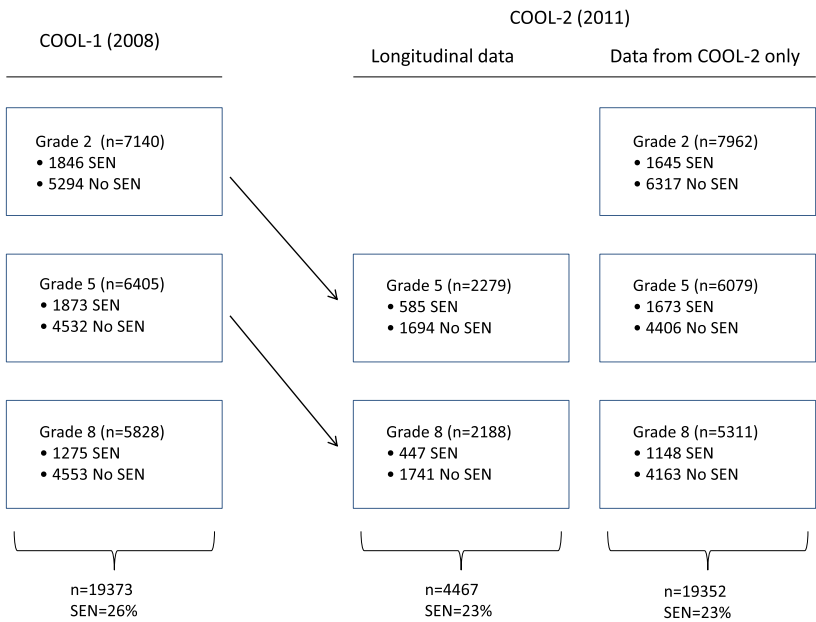


Figure 1. Data available about SEN in pupils as estimated by the teacher.

Instruments

Teacher perceptions are central to the present study. Various instruments were used. Data were included from the so called 'Pupil Profile Questionnaire', the 'SEN Profile Questionnaire', achievement tests, and additional information about the pupils' background and school characteristics. Table 1 provides an overview of instruments and variables in the study.

Pupil Profile Questionnaire

Teachers were asked to complete the Pupil Profile Questionnaire for every pupil in their class. In the present study average scores from seven item scales are used (see Table 1). The item scales have been validated in previous cohort studies. Alpha reliability scores range from 0.82 to 0.93.

The first four scales refer to the teacher's judgment of whether the pupil is underachieving, the pupil's behaviour, attitude to work and popularity with classmates. Examples of items are: 'The pupil's performance is not in par with the pupil's abilities' (Underachieving); 'The pupil is often cheeky', 'The pupil always tries to get his/her own way' (Behaviour); 'The pupil quickly feels work is finished', 'The pupil quickly stops working if (s)he feels (s)he does not succeed' (Attitude to work); 'The pupil gets along well with classmates' (Popularity with classmates).

The other three scales provide an indication of the relation between the teacher and the pupil, as estimated by the teacher. Scales indicate whether the pupil is dependent upon the teacher, whether there are many conflicts between the teacher and the pupil, and whether the teacher feels close to the pupil. Examples of items are: 'Pupil constantly needs endorsement from me', 'Asks for help when this is not really necessary' (Dependent on teacher); 'This pupil has the feeling I am treating him unfairly', 'Dealing with this pupil requires a lot of my energy' (Conflicts); 'This child speaks freely with me about its feelings and experiences', 'This child appears to feel safe with me' (Closeness to teacher).

SEN Profile Questionnaire

Teachers were asked to complete the SEN Profile Questionnaire for every pupil in their class they had identified as a pupil with SEN, providing details about the nature and severity of the pupil's problems and/or disorders. In COOL-1, the questionnaire included a list of 30 difficulties or disorders. In COOL-2, the list was changed at some points and included 38 items. For each item that was presented, teachers were asked to state whether the problem applied to the pupil in question, and if so, what the severity was (see Table 1). Factor analyses and reliability analyses were carried out in order to reduce the number of items and construct scale variables. Data from COOL-2 resulted in six scale variables: externalising problem behaviour, internalising problem behaviour, problematic attitude to work, communication problems, intellectual impairment/delayed cognitive development and lagging behind in literacy and/or numeracy. Four items were clustered within physical disability and three single items were retained: dyslexia, autism spectrum disorder, gifted. Three variables were omitted because of very low prevalence (dyscalculia, other learning disorder, other psychiatric disorder).

Alpha reliability scores of the scales were sufficiently high, except for the scale referring to intellectual impairment/delayed cognitive development. Nevertheless, it has been decided to include this scale in the analyses because of the relevant information

Table 1. Instruments, variables and score range.**Pupil Profile Questionnaire (completed by teacher for every pupil in class)***Scale variables (range 1–5):*

Underachieving (3 items; $\alpha = 0.85$); behaviour (4 items; $\alpha = 0.82$); attitude to work (3 items; $\alpha = 0.82$); popularity with classmates (3 items; $\alpha = 0.87$); dependent on teacher (5 items; $\alpha = 0.91$); conflicts with teacher (5 items; $\alpha = 0.93$); closeness to teacher (5 items; $\alpha = 0.87$)

SEN Profile Questionnaire (completed by teacher for every pupil in class with SEN)*Scale variables (range 0–3):*

Externalising problem behaviour (7 items; $\alpha = 0.82$); internalising problem behaviour (7 items; $\alpha = 0.76$); problematic attitude to work (3 items; $\alpha = 0.76$); communication problems (5 items; $\alpha = 0.84$); intellectual impairment/delayed development (3 items; $\alpha = 0.49$); being behind at literacy/numeracy (3 items; $\alpha = 0.71$)

Single variables (range 0–3):

Physical disability (includes 4 items); dyslexia; autism spectrum disorder; giftedness; number of problems (constructed from other variables, range 1–10)

Pupil characteristics

Boy (0/1); education level of parents (range 1–4; 1 = primary school only, 4 = higher education); parents divorced (0/1); ethnic minority background (0/1)

Achievement (standardised tests)

Grade 2: math skills for toddlers (9–140); language skills for toddlers (1–108)

Grade 5: math skills (0–123); vocabulary (11–141); technical reading skills (6–124)

Grade 8: math skills (24–169); technical reading skills (18–124)

School characteristics

School size (range 0–4; 0 = less than 100 pupils, 4 = 400 pupils or more); proportion of pupils from ethnic minority groups (0–100%); population density of municipality (range 0–4; 0 = rural, 4 = very dense); denomination (3 dummy variables: protestant, catholic, non-denominational, reference = public)

Notes: Results from reliability tests refer to COOL-2; the scale 'Communication problems' was available in COOL-2 only.

it provides. The scale 'Communication problems' was available at the second measurement only, since the questionnaire had been changed in part. In COOL-1 a single item had been included that referred to speech or language disorder. In order to be able to compare results from both scale variables and single items, for each scale the highest score given by the teacher over the items included was calculated. As a result of this, a potential range of 0–3 was obtained: 0 = problem is absent; 1 = applies to some extent; 2 = applies to a fair extent; 3 = applies to a serious extent. Examples of items are: 'The pupil has ADHD', 'The pupil is aggressive to classmates', 'The pupil is a bully' (Externalising problem behaviour); 'The pupil has a lack of dedication', 'The pupil has a lack of concentration', 'The pupil has a low working pace' (Problematic attitude to work); 'The pupil is frightened, depressed', 'The pupil has a lack of confidence, a low self-image' (Internalising problem behaviour).

Achievement tests

Test results were obtained from standardised tests of language (technical reading performance and vocabulary) and math skills that had been developed by the National Institute for Educational Measurement (CITO). These tests are included in the monitoring system of pupils' cognitive attainment that is used in the majority of primary schools in the Netherlands. From grades 3 to 8, results are expressed as skill scores on a continuous scale. Language and math tests that target grade 2 are of a different kind, and skill scores from these tests are not comparable with those obtained in grades 3–8 (see Table 1).

Additional background information

Additional background information about pupils was obtained from the teacher and from the school administration. This comprises information about the pupils' gender, whether the pupil has an ethnic minority background, the education level of the pupil's parents and whether the pupil's parents are divorced. Information about school characteristics was obtained from data provided by the Ministry of Education and Science. This included information about the school size, the proportion of pupils from ethnic minority groups and the population density of the municipality where the school is located (see Table 1).

Data analysis

Descriptive analyses were carried out in order to present information about the proportion of pupils that had been identified with SEN by their teachers and about the prevalence of various types of problems or disorders. Analyses of variance were used to find significant differences between groups within the same measurement occasion. Multilevel logistic regression analyses were applied to find out which pupil and school variables in COOL-2 significantly contributed to predicting whether a pupil was identified with SEN by the teacher at that measurement occasion. In addition, multilevel logistic regression analyses were carried out to identify significant predictors of referral to special education between the first and second measurement occasion of pupils who had been identified with SEN at the first measurement occasion (COOL-1).

Results

SEN as identified by teachers

The first research question addressed the proportion of pupils who have been identified with SEN by their teachers, as well as the nature and severity of their problems. Approximately, one quarter of the pupils were considered by their teachers to have SEN. This was the case with 26% in the COOL-1 reference sample and 23% in the COOL-2 reference sample. Results from the reference sample from COOL-2 show that, according to teachers, the most common problems of pupils with SEN are lagging behind in literacy and/or numeracy (17%), having a problematic attitude to work (15%), suffering from internalising disorders (13%), and having communication problems (11%). In most of these cases problems were estimated as being present to some or to a fair extent, but not to a serious extent (see Table 2). At both measurement occasions, the percentage of pupils with SEN, as estimated by their teacher, was highest in grade 5 (30% in COOL-1 and 27% in COOL-2). Differences between grades were significant ($F = 54.80$; $p < 0.001$ in COOL-2). Teachers estimated that 90% of pupils with SEN suffered from more than one problem or disorder. The average number reported in the COOL-2 reference group was 3.7 ($SD = 1.7$). No significant differences between grades were found in this respect.

Predictors of being identified with SEN

The second research question addressed the variables that appear to be significant predictors of a pupil being identified with SEN by the teacher. The dependent variable is 'Identification

Table 2. Type and extent of problems or disorders in pupils as estimated by the teachers; COOL-2 reference sample (n = 19,615).

	To some extent (%)	To a fair extent (%)	To a serious extent (%)	Total (%)
Lagging behind in literacy and/or numeracy	7.3	6.4	2.9	16.6
Problematic attitude to work	6.2	5.8	2.5	14.5
Internalising problem behaviour	7.1	4.3	1.7	13.1
Communication problems	5.6	4.2	1.6	11.4
Intellectual impairment/delayed cognitive development	4.7	3.3	1.1	9.1
Externalising problem behaviour	3.4	3.1	1.9	8.4
Dyslexia	1.3	1.7	1.2	4.2
Physical disability	1.7	0.6	0.4	2.7
Autism Spectrum Disorder	0.8	0.6	0.4	1.8
Gifted	0.6	0.4	0.2	1.2

Note: 'Total' refers to the percentage from the reference sample who are considered by their teacher to have the respective problem or disorder to at least some extent.

with SEN by the teacher'. Data are available from the total sample of the second measurement occasion of the COOL cohort study. In Table 3, variables are highlighted that explain over 4% of variance in the dependent variable 'Being identified with SEN'. In grades 2, 5 and 8 pupils estimated as having SEN on average performed less well as compared to pupils not estimated as having SEN on achievement tests. Apart from this, pupils with SEN in grade 2 were on average rated less positively by teachers on underachievement, attitude to work, and popularity with classmates, they were considered to be more dependent upon the teacher, and had more conflicts with the teacher. In grade 5, two scale variables from the Pupil Profile Questionnaire showed large differences between pupils estimated as having SEN and their classmates. Pupils with SEN were on average rated less positively on their attitude to work and they were considered to be more dependent on the teacher. In grade 8, only the pupil's attitude to work, as estimated by the teacher, showed a considerable difference between pupils with and pupils without SEN. In addition, there was a notable age difference between pupils with and pupils without SEN in grade 8 (see Table 3).

Multilevel logistic regression analyses were performed to find out which variables were significant predictors of being identified with SEN, when correcting for other variables. These analyses were carried out separately for grades 2, 5 and 8. In all grades, boys are more likely to be identified with SEN than girls, all else being equal. Results also show that, apart from achievement scores, two scale variables from the Pupil Profile Questionnaire significantly add to the prediction of being identified with SEN by the teacher across all grades included in the study: the pupil's attitude to work, and the extent of the pupil being dependent on the teacher. Pupils who are considered by the teacher to have a less positive attitude to work, and who are more dependent on the teacher, are more likely to be identified with SEN. In addition, in grades 2 and 5 pupils are more likely to be identified with SEN when they are performing below the expectations of the teacher, and when they are less popular with

Table 3. Descriptive results for pupils identified with and pupils not identified with SEN by the teacher in grades 2, 5 and 8; percentages/mean scores (COOL-2, total sample).

	Grade 2		Grade 5		Grade 8	
	No SEN	SEN	No SEN	SEN	No SEN	SEN
<i>Pupil characteristics</i>						
Boy	49%	60%	48%	55%	48%	53%
Part of ethnic minority group	18%	31%	21%	21%	20%	22%
Education level of parents						
Primary school only	5%	12%	6%	7%	7%	9%
Junior secondary vocational educ.	12%	19%	14%	17%	14%	23%
Senior secondary vocational educ.	43%	41%	41%	43%	43%	43%
Higher education	41%	28%	39%	33%	37%	25%
Parents divorced	13%	16%	16%	20%	20%	22%
Age (years)	5.67	5.75	8.79	8.94	11.86	12.09
<i>Test results</i>						
Math skills for toddlers	61.03	51.93	n/a		n/a	
Language skills for toddlers	65.16	56.58	n/a		n/a	
Math skills (grades 3–8)	n/a		73.57	63.34	111.91	101.01
Vocabulary (grades 3–8)	n/a		64.53	57.38	n/a	
Technical reading skills (grades 3–8)	n/a		76.30	63.16	100.42	91.55
<i>Pupil Profile Questionnaire</i>						
Underachieving	2.40	2.83	2.44	2.77	2.37	2.57
Behaviour	3.70	3.45	3.76	3.55	3.78	3.62
Attitude to work	3.52	2.94	3.57	3.08	3.61	3.11
Popularity with classmates	3.85	3.45	3.68	3.44	3.73	3.50
Dependent on teacher	2.06	2.52	2.00	2.46	1.90	2.25
Conflicts with teacher	1.65	2.01	1.63	1.89	1.64	1.84
Closeness to teacher	3.95	3.72	3.71	3.65	3.58	3.51

Note: Means printed in boldface and italic if $E^2 > 0.04$, based on results from analyses of variance.

classmates. In these grades pupils who are older are more likely to be identified with SEN than younger pupils. In grade 2, pupils whose parents are lower educated are more likely to be identified with SEN as compared to pupils with parents who received a higher education. School characteristics that were included in the analyses did not contribute significantly to predicting whether a pupil was identified with SEN, with one exception. Chances of being identified with SEN in grade 8, all else being equal, are larger in small schools (Table 4).

Stability of being identified with SEN by teachers

The third research question refers to the stability of being identified with SEN by teachers. Table 5 shows whether pupils with SEN who did not drop out of the cohort were identified with SEN again three years after, and whether no-SEN pupils from the first measurement occasion were still not considered to have SEN on the second measurement occasion. Longitudinal data are available from 4467 pupils. A total of 517 pupils (11.6%) were identified with SEN at the first measurement occasion and not at the second occasion, whereas 512 pupils (11.5%) who were not identified with SEN at the first measurement occasion were at the second. More changes occurred between grades 2 and 5 (26%) than between grades 5 and 8 (20%). On the whole, 65% of pupils who were still part of the cohort at the second measurement occasion were not considered to have SEN at either of two occasions, whereas 12% according to their teachers were SEN pupils at both moments, and 23% 'changed label' between these two measurement occasions.

Table 4. Significant predictors of being identified with SEN by the teacher; results from multilevel logistic analyses in grades 2, 5 and 8 (COOL-2).

	Grade 2		Grade 5		Grade 8	
	Estimate	SE	Estimate	SE	Estimate	SE
<i>Pupil characteristics</i>						
Boy	0.361	0.078	0.322	0.070	0.368	0.103
Age	1.278	0.104	0.452	0.069	ns	
Part of ethnic minority group	ns		ns		ns	
Education level of parents	−0.098	0.047	ns		ns	
Parents divorced/separated	ns		ns		ns	
<i>Test results</i>						
Math skills for toddlers	−0.025	0.004	n/a		n/a	
Language skills for toddlers	−0.077	0.006	n/a		n/a	
Math skills (grades 3–8)	n/a		−0.042	0.003	−0.060	0.005
Vocabulary (grades 3–8)	n/a		−0.011	0.003	n/a	
Technical reading skills (grades 3–8)	n/a		−0.055	0.002	−0.038	0.004
<i>Pupil Profile Questionnaire</i>						
Performing below expectations	0.236	0.052	0.185	0.048	ns	
Behaviour	ns		ns		ns	
Attitude to work	−0.279	0.051	−0.153	0.045	−0.135	0.063
Popularity with classmates	−0.438	0.057	−0.098	0.044	ns	
Dependent on teacher	0.403	0.055	0.472	0.045	0.328	0.067
Conflicts with teacher	ns		ns		ns	
Closeness to teacher	ns		ns		ns	
<i>School characteristics</i>						
School size	ns		ns		−0.196	0.083
Population density	ns		ns		ns	
Denomination	ns		ns		ns	
% of pupils from ethnic minorities	ns		ns		ns	

Notes: Grade 2: 6694 pupils in 342 schools; grade 5: 8184 pupils in 394 schools; grade 8: 3662 pupils in 315 schools. The number of pupils from grade 8 in the analysis is substantially lower, since about 25% of the schools still used an older version of the math skills test in this grade. Outcomes of that version are not comparable to outcomes of the latest version.

Table 5. Stability of the ‘SEN label’ over a three-year interval (n = 4467).

	Number of pupils	%
<i>From grade 2 to grade 5</i>		
SEN in grade 2 and grade 5	216	9.5
SEN in grade 2, no SEN in grade 5	225	9.9
No SEN in grade 2, SEN in grade 5	369	16.2
No SEN in grade 2, no SEN in grade 5	1469	64.5
<i>From grade 5 to grade 8</i>		
SEN in grade 5 and grade 8	304	13.9
SEN in grade 5, no SEN in grade 8	292	13.4
No SEN in grade 5, SEN in grade 8	143	6.5
No SEN in grade 5, no SEN in grade 8	1449	66.2
<i>Total</i>		
SEN in 2008 and 2011	520	11.6
SEN in 2008, no SEN in 2011	517	11.6
No SEN in 2008, SEN in 2011	512	11.5
No SEN in 2008, no SEN in 2011	2918	65.3

Just over 10% of pupils have dropped out of the cohort because they had been retained or referred to special education. In addition, some pupils had changed school or the school had decided not to take part in the second measurement occasion. Figure 2 gives an overview of school careers for pupils who either had stayed in the cohort, had been retained in the same school or had been referred to special education after the first measurement occasion. From the pupils who had been identified with SEN by their teacher in grade 2, 12%

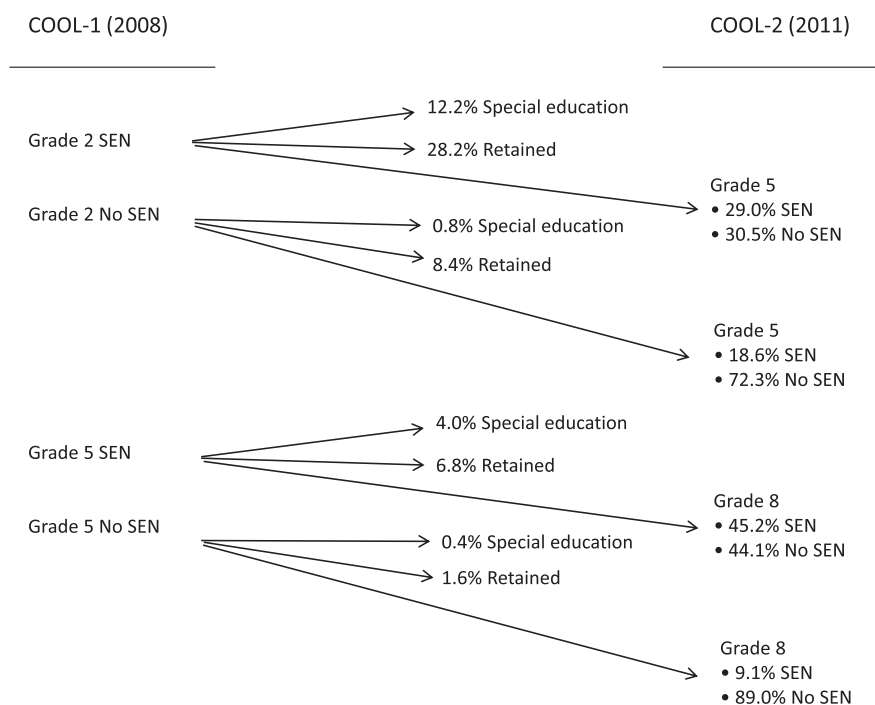


Figure 2. School career of pupils between the first- and second-measurement occasion of the cohort study; pupils identified with SEN and pupils not identified with SEN.

were referred to special education and 28% repeated a grade. At the second measurement occasion, 60% were in grade 5, about equally divided between pupils who were identified with SEN again at that occasion, and pupils who were not identified with SEN anymore by their teacher. From the group who had not been identified with SEN in grade 2, 8% had been retained between grades 2 and 5, almost 1% had been referred to special education, and 19% were identified with SEN in grade 5, at the second measurement occasion. From pupils who had been identified with SEN in grade 5 at the first measurement occasion, 7% had been retained and 4% had been referred to a special school after COOL-1. Pupils from this group who were in grade 8, three years later, were equally divided among pupils who were and pupils who were not considered by their teacher to have SEN. Nine out of 10 pupils who had not been identified with SEN in grade 5 had reached grade 8 three years later without any delay and without being identified with SEN at COOL-2.

Predictors of being referred to special education between grades 2 and 5

In the fourth research question, the topic of predicting referral to special education of pupils after having been identified with SEN was addressed. Logistic regression analysis was applied to check which variables from the first measurement occasion (COOL-1) contributed significantly to this referral. The analyses were restricted to pupils who were in grade 2 at the first measurement occasion, because this group was considerably larger than the group that had been referred from grade 5 onwards. A four-step procedure was followed. First, information about the nature and severity of SEN that had been provided in the SEN Profile Questionnaire

Table 6. Significant predictors of being referred to special education between grades 2 and 5 after having been identified as a pupil with SEN in grade 2; results from logistic regression analyses (n = 1372).

	<i>B</i>	<i>SE</i>	Wald	<i>p</i>	Exp(<i>B</i>)
Intellectual impairment/delayed cognitive development (SEN Profile Questionnaire)	0.736	0.085	75.58	<0.001	2.09
Behaviour (Pupil Profile Questionnaire)	−0.567	0.119	22.81	<0.001	0.57
Performing below expectations (Pupil Profile Questionnaire)	−0.445	0.121	13.51	<0.001	0.64
Part of ethnic minority group	−0.844	0.240	12.37	<0.001	0.43
Math skills for toddlers (grade 2 test score)	−0.032	0.010	10.94	<0.005	0.97
Education level of parents	−0.437	0.142	9.50	<0.005	0.65
Attitude to work (Pupil Profile Questionnaire)	−0.319	0.127	6.35	<0.05	0.73
Constant	3.693	0.776	22.64	<0.001	40.17

by the teacher at COOL-1 was entered in the analysis. Subsequently, significant predictors were retained and pupil characteristics were entered. Third, scores from the Pupil Profile Questionnaire that had been provided by the teacher were added to the significant predictors from the second step. In the fourth step, significant predictors were retained and subsequently math skills test scores and language skills test scores from grade 2 were added. Table 6 shows the significant predictors that resulted from these analyses. From the SEN Profile Questionnaire only one predictor proved to be significant: the amount of intellectual impairment and/or delayed cognitive development, as estimated by the teacher. This is the factor that turned out to be the most influential predictor. Pupils with a higher degree of intellectual impairment and/or delayed cognitive development are more likely to be referred to special education. In addition, three variables from the Pupil Profile Questionnaire turned out to be significant predictors. Pupils who had been rated more positively by their teacher with respect to behaviour and attitude to work and/or who were performing below the teacher's expectations were less likely to be referred to special education, all else being equal. Pupils who had performed better at the math skills test in grade 2 were less likely to be referred to special education. The math skills test proved to be a better predictor of referral than the language skills test. In addition, pupils who were part of an ethnic minority group and pupils whose parents had been educated at a higher level were less likely to be referred, after controlling for the influence of the other predictors in the analyses.

The variables included in the logistic regression analysis resulted in 89% accurate predictions, with 18% of referrals and 99% of non-referrals being correctly predicted. The variables included in the model resulted in a significantly better prediction of referral as compared to the empty model ($\chi^2 = 194.15$, $df = 7$, $p < 0.001$, Nagelkerke $R^2 = 0.26$).

In order to check for additional significant predictors at the school-level, multilevel analyses were carried out. In these analyses, school-level variables were included, as were listed in Table 1. These school-level variables did not add significantly to the prediction of referral of pupils to special education, however.

Discussion

In the first research question, the proportion of pupils in mainstream primary schools who have been identified with SEN by their teacher was addressed, as well as the nature and severity of the problems of these pupils. Teachers estimated that around 25% of the pupils in their class have SEN. Lagging behind at literacy and/or numeracy, having a problematic attitude to work, suffering from internalising disorders and having communication problems were listed as the most common problems of these pupils. The first three of these problems had also been listed as most common in an earlier study in the Netherlands (Van der Veen, Smeets, and Derriks 2010). Findings also confirm outcomes from other studies that pupils with SEN do not form a clearly defined group (Pijl, Frostad, and Flem 2008) and in fact form a heterogeneous group with a spectrum of needs (Bruggink, Goei, and Koot 2013).

The focus of the second research question was on variables that significantly predict whether a pupil is identified by his or her teacher as having SEN. The finding that boys are more likely to be identified with SEN than girls, all else being equal, is in line with the observation made by Banks, Shevlin, and McCoy (2012) and by Keslair and McNally (2009) that teachers over-identify certain groups of pupils when drawing conclusions about whether or not the student has special needs. The same applies to the outcome that pupils in grade 2 whose parents are less well educated are more likely to be identified with SEN as compared to pupils with parents who received a higher education. Apart from this, other factors were found to be relevant, including the pupil's attitude to work, the popularity with classmates, the question whether the pupil was performing below the teacher's expectations, and the extent of the pupil being dependent on the teacher. Outcomes on these variables are the result of teacher perceptions which, again, might be biased. These results are on par with results reported by Cook, Cameron, and Tankersley (2007) and Schwab et al. (2014), stating that teachers to some extent hold different attitudes towards pupils with SEN and tend to give lower ratings to pupils with SEN for their social competences.

The third research question concerned the stability of the identification with SEN within the same pupil over a three-year interval. Obviously, the stability of the 'SEN label' is questionable, since 23% of pupils who participated at both measurement occasions had 'changed label' over the three-year period. A possible explanation of this outcome is that pupils who had been identified with SEN at the first measurement occasion actually did not have SEN anymore three years later, and that some of the pupils who did not have SEN at the first measurement occasion developed SEN in the three year interval between the first and second data collection. Since the study relied on teachers' judgments, it is not possible to draw conclusions about the percentage of pupils who actually developed or overcame SEN between the two measurement occasions. Based on outcomes from other studies, it might be postulated that between teacher differences account for at least some of the changes in judgments about pupil's special needs. Since there are some doubts about the extent to which teachers are prepared for educating students with SEN (Pijl 2010; Schram, Van der Meer, and Van Os 2013), and since outcomes of studies are that SEN are not always recognised

by teachers and that certain student groups are over-identified (Banks, Shevlin, and McCoy 2012; Isaksson, Lindqvist, and Bergström 2010; Van der Veen, Smeets, and Derriks 2010), it is plausible that insufficient competences of teachers play a role at this point. This would call for professional development targeting teachers' competences at detecting and analysing SEN in pupils. It is recommendable that future research targets this matter.

The fourth research question addressed significant predictors of referral to special education of pupils who have been identified with SEN. Van der Veen, Smeets, and Derriks (2010) found that the likelihood of referral to special education was highest for students whose problems were of a cognitive nature, such as students with intellectual impairment. In the present study, this outcome is confirmed. The amount of intellectual impairment and/or delayed cognitive development, as estimated by the teacher, turned out to be the most influential predictor of being referred to special education. Apart from this, the pupil behaviour, as perceived by the teacher, played an important role in the decision whether or not to refer a pupil to special education.

The outcomes of the present study stress the importance of teacher training as well as teacher professional development fostering the teachers developing skills to recognise students' additional support needs, as Bruggink, Goei, and Koot (2016) recommended also. In addition, more focus on teachers' awareness of the risk of over-identification of certain pupil groups, as well as more focus on teachers' abilities at providing education that meets the specific needs of pupils with SEN may be expected to contribute to improving teaching and learning in inclusive classes.

Limitations of the study

At this point, a few limitations of the present study should be stressed. First, the question whether or not a pupil had SEN was based on the assessment by the teacher. No validation by other experts has been made. Second, in order to limit the workload for teachers who participated in the study, no questionnaires have been administered to collect information about teacher characteristics and classroom practice. Third, only a limited amount of data could be gathered about pupils who had dropped out of the cohort after the first measurement occasion.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

This work was supported by the Netherlands Organisation for Scientific Research (NWO) [grant number 413-11-010].

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