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Behaviour-emotional characteristics of primary-school children rated as having language problems

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Introduction

Children who do not attain the expected level of verbal competence during primary school often enter a cycle of continuing disadvantage if they are not given appropriate remediation (Snowling, 2000; Tallal, Allard, Miller, & Curtiss, 1997), and language difficulties are also common among children with various mental health problems (Cohen, Barwick, Horodezky, Vallance, & Im, 1998; Helland & Heimann, 2007). Thus, assessment of language problems (LP) among primary school children is an important task for school psychologists. The child's problem must, in the first instance, be detected. This task is commonly given to school teachers, who should be able to evaluate a child's articulation, how he/she expresses him/herself and his/her ability to comprehend and use the language in a naturalistic setting, for example in a classroom. Although teachers commonly report that they have received little or no formal training in how to identify LPs, they are still shown to be reliable evaluators of children's language abilities (Lindsay & Dockrell, 2000; mroz, 2006; Newman & McGregor, 2006).

Several longitudinal studies have demonstrated a close link between language problems and behavioural problems (Camarata, Hughes, & Ruhl, 1998; Cohen, 2001; Spira, Bracken, & Fische, 2005; Warr-Leeper, Wright, & Marck, 1994). Although the relationship between language problems and emotional problems (e.g. symptoms of anxiety and depression) does not seem to be as strong (Kashani et al., 1983; McGee & Share, 1988), a child with emotional problems may show a lower level of reading skills in preadolescence than his/her peers and a lower ability to use language competently within a classroom setting (McGee & Share, 1988).

In general, language problems are reported to be more common in boys than girls (Rutter et al., 2004), although the gender difference is not reported to be as large in population-based studies as in clinical samples (Biederman et al., 2005). Several studies have

documented that boys display higher levels of disruptive behavioural problems than girls (Kim-Cohen et al., 2005; Messer, Goodman, Rowe, Meltzer, & Maughan, 2006; Moffit, Caspi, Harrington, & Milne, 2002). Preadolescent internalising disorders do not display marked gender differences (Messer et al., 2006), but such problems will more often appear later in adolescence in girls than in boys (Chesney-Lind & Sheldon, 1998; Gaub & Carlson, 1997; Wade, Cairney, & Pevalin, 2002). The picture for children with language problems is, however, complex. Beitchman et al. reported that girls with impaired language have a higher risk of behavioural problems than boys (Beitchman et al., 1996), while Plomin and collaborators found that boys with extremely low scores on language tests showed a higher risk of behavioural problems than girls (Plomin, Price, Eley, Dale, & Stevenson, 2002). Less is known about how primary school teachers rate their pupils on all three areas of function.

Although the teacher's perspective has very little to do with the origins of the problems, it may influence how the teachers respond to co-occurring problems and what sort of intervention they may recommend (Lindsay & Dockrell, 2004). If two children with language problems are evaluated to be at opposite ends of a continuum of behavioural problems, the child with symptoms that disturb in a classroom situation will probably be the one who is referred to further assessment and remediation. The child on the other end of the continuum, e.g. with emotional problems, may, as Lindsay and Dockrell points out, remain undetected by his/her teacher throughout primary school. However, a child's disruptive behaviour may be specific to the school setting. Several studies have shown that the agreement between parents and teachers is low to moderate in reports of child psychiatric symptoms (Achenbach, McConaughy, & Howell, 1987; Kumpulainen et al., 1999; Posserud, Lundervold, & Gillberg, 2005), both for children with language problems and for groups with other developmental difficulties (Lindsay & Dockrell, 2000).

The present study investigates the association between language problems and behaviour-emotional problems as reported by primary school teachers, participating in a Norwegian total population study of 7 to 9 year-old children (2 – 4th grade). We ask if the teachers characterise the behavioural and emotional function differently in children that they report to have language problems compared to children without such problems. Based on earlier studies we expect (1) that behaviour-emotional problems will be substantially more frequent in children reported to have language problems than in children without such reports, (2) that more boys than girls will be reported to have language problems, and (3) that there will be a gender-specific correlation between teacher-reported language problems and behaviour-emotional problems. Finally, we explore how the parent reports corresponds to the teacher reports of language- and behaviour-emotional problems, and how an agreement on the identification of language problems influences the frequency of behaviour-emotional problems.

Methods

The present study is part of the Bergen Child Study (BCS). The protocol and population of the BCS are described in detail in separate publications (Heiervang et al., 2007; Stormark, Heiervang, Heimann, Lundervold, & Gillberg, in press), and only a brief description will be given here. The BCS is a prospective longitudinal total population study of the 9430 children who attended 2-4th grade in all public, private and special schools in Bergen, Norway, in October 2002. We were not able to investigate the group of children in public, private and special schools, separately. In order to ensure the confidentiality, the teacher questionnaire did not involve demographic information to prevent involuntary disclosure for children in the non-response group. However, only 1.6% of the pupil population in Norway attends private primary or lower secondary schools, and the percentage of pupils in special settings outside

the compulsory school is estimated at 0.5% of the total number of pupils (Anthun & Manger, 2006).

The original BCS included three stages. In the first stage, a four-page screening questionnaire was sent to all parents and teachers of the children in the population sample. The primary instrument was the Strengths and Difficulties Questionnaire (SDQ) (Goodman, 1999), generating information about five aspects of behaviour-emotional function. The screening questionnaire also included the Autism Spectrum Screening Questionnaire (Ehlers & Gillberg, 1999), a somewhat revised version of the Swanson, Nolan, and Pelham scale (SNAP-IV) (Swanson et al., 2001) and items designed for use in the study, including items assessing language function and use of educational services. The screening questionnaire was sent to all teachers, and they were asked to pass a parent version on to the parents of all the children in his/her class. The teachers were requested to fill in the questionnaires for all children, but only identify the children whose parents gave their informed consent to participate. The remaining questionnaires were sent back to the project group as anonymous forms. The present study includes both the identifiable and anonymous teacher reports on the SDQ, items pertaining to language function and use of educational services. Parent reports of the identified children were used to investigate the agreement between the two informants. In the second stage of the original BCS, a subsample of parents was interviewed according to the Development and Well-Being Assessment (Goodman, Ford, Richards, Gatward, & Meltzer, 2000b). In a third in-depth clinical examination, motor, cognitive and emotional functions were evaluated in a case-control selected sample (n = 304). Wechsler's Intelligence Scale for Children, third edition (Wechsler, 1992), was included in this third stage of the study. The test was scored according to Swedish norms (Sonnander, Ramund, & Smedler, 1998).

Participants

The teacher questionnaire was returned for 97.2 % (n = 9155) of the children. The questionnaires were completed in terms of the SDQ and the four items relating to language function for a total of 9141 children. Information on gender was, however, obtained for 9072 children (49.1% girls), which was the final teacher sample in the present study. The corresponding final parent sample was 6234 children, 50.3% girls.

The study was approved by the Regional Committee of Ethics on Medical Research in Western Norway. In accordance with Norwegian law, the study was reported to and approved by the Ombudsman for privacy in Research, Norwegian Social Science Data Services Ltd.

Measures

The *Strengths and Difficulties Questionnaire (SDQ)* (Goodman, Ford, Richards, Gatward, & Meltzer, 2000a) is a screening questionnaire for emotional and behavioural problems, designed for children aged 4-16 years. Twenty-five items (in five subscales, each with five items) describe positive and negative attributes of children. The five subscales are: (1) Emotional problems, (2) Conduct problems, (3) Hyperactivity-inattention problems, (4) Peer relationship problems and (5) Prosocial behaviour. A total difficulty score is computed by adding the first four subscale scores. Each subscale is scored on a three-point scale; “not true”, “somewhat true” and “certainly true”, with total subscale scores ranging from 0 – 10 and a total difficulty score from 0 - 40. A high score indicates problems on the first four subscales, while a low score indicates problems on the Prosocial behaviour subscale. The SDQ has been extensively validated in various countries (Muris, Meesters, & van den Berg, 2003; Smedje, Broman, Hetta, & von Knorring, 1999), and has been found to discriminate well between high and low risk samples (Goodman & Scott, 1999; Klasen et al., 2000). A cut-off point for defining a child as a high scorer on the SDQ was set at the 90th percentile on the

total difficulty score in the BCS population sample. This percentile has been recommended as a screening cut-off by Goodman (Goodman, 1997) to include children in the “clinical range”. Children with lower scores, defined as normal (< 80th percentile) or borderline (80th to 90th percentile) by Goodman (Goodman, 2001), were defined as low scorers in the present study. In addition, we included the impact assessment, based on the overall problem severity, duration, distress to the child, interference in everyday life and burden to others (see www.sdqinfo.com for more details).

A part of the *stage 1* questionnaire, the teachers and parents were asked to answer four questions related to *language function*. The answers were scored on a three-point scale (0 = not true, 1 = somewhat true and 2 = certainly true). The items were:

1. Can not pronounce certain words or sounds.
2. Can not elaborate, explain or express himself/herself.
3. Has difficulties understanding things that are being said.
4. Has difficulties having a conversation with someone.

An answer of “certainly true” or “somewhat true” on one of these questions indicates that the child has problems related to this specific language function. In defining language problems, we decided that a problem had to be reported on more than one item. Therefore, we defined language problems (LP) if a teacher checked at least “certainly true” on one item and “somewhat true” on another item, or “somewhat true” on at least three of the items. This equals a sum score of 3 or above across the four language items, a score that corresponds to the 95th percentile in the population sample and the median prevalence of speech and language delay reported by Law et al. (Law, Boyle, Harris, Harkness, Nye, C., 2000). All other children were allocated to a group without language problems (NLP). This definition of LP was supported by the fact that 76.8% of the children defined as having LP had been referred to a speech therapist (65.8%) and/or to special training at school (69%). The

correspondent number of referred children in the NLP group was 13.9%, 10.3% to a speech therapist and 9.7% to special training at school. In that the children included in this stage of the BCS were not evaluated on formal tests, we have no direct information about the association between other cognitive deficits and LP. An indication of a high frequency of a more general learning problems in the LP group was found in the sub-sample included in the third stage of BCS ($n = 294$). The full scale IQ (FSIQ) in the LP group ($M = 69.3$, $SD = 21.6$) was found to be significantly lower ($p < .001$) than in the NLP group ($M = 92.2$, $SD = 15.6$). In the LP group, 70.3% obtained a Total IQ score below 70, compared to 28% in the NLP group, indicating a more general cognitive impairment in a subgroup of children with LP. Only three children (5.4%) in the LP group obtained an IQ score >100 , while this was true for 28.8% in the NLP group.

The agreement between teachers and parents in defining a child as LP was performed on the children with both teacher and parent reports on all the included items. The distribution of answers in the parent group was more skewed to the left than the teacher reports, and the 95% percentile in the parent group equals 2. This means that a child is defined as having LP if the parent checked “certainly true” on at least one of the items or “somewhat true” on at least two of the items.

Statistical analyses

For statistical analyses we used the SPSS package, version 14. Independent samples t-tests were used to test the hypothesis of differences between the LP and NLP group on the SDQ and between boys and girls within the two language groups. Chi-square tests were used to compare the proportion of high-scorers within the two language groups. Due to the large sample, p -values tend to be significant with marginal differences between the groups. Therefore we included calculations of effect sizes (d -values), according to the formula $d =$

$(\text{Mean}_{\text{LP}} - \text{Mean}_{\text{NLP}}) / \text{pooled standard deviation}$, where $\text{pooled standard deviation}^2 = [n_E - 1] (S_E)^2 + [n_C - 1] (S_C)^2 / (n_E + n_C)$, where n_E and n_C are the number of observations in the two groups, and S_E and S_C are the standard deviations for the two groups. S pooled is the square root of S^2 pooled. A general guideline for interpreting the d -value is that a d of .20 is small, a d of .50 is moderate and a d of .80 is large (Cohen, 1988).

The test for agreement between teachers and parents in defining a child as LP was performed on 6234 children. The definitions of language problems (LP vs. NLP) and emotional-behavioural problems (low versus high scores on the SDQ) were used when comparing teacher and parent reports. Correlations between scores from parents and teachers were estimated using Pearson correlations. A paired-samples two tailed t -test was used to compare the scores on the parent and teacher reports for the same child. Agreement between parents and teachers was analyzed using Cohen's kappa (κ) for dichotomized items (i.e. LP/NLP and high/low SDQ scorers).

Results

Overall language score and the SDQ total difficulty score

The mean composite score generated from the four language items was 4.2 ($SD = 1.2$), with a statistically significant higher problem score in the group of boys ($M = 0.54$, $SD = 1.3$) than in the group of girls ($M = .29$, $SD = 1.0$) ($p < .001$, $d = .22$). The mean total SDQ score was 4.5 ($SD = 5.0$), with a statistically significant higher difficulty score in the group of boys ($M = 5.7$, $SD = 5.6$) than girls ($M = 3.3$, $SD = 3.9$). A univariate analysis of variance showed no significant effect of grade (i.e. 2nd to 4th grade). The Pearson correlation between the teachers' answers on the four items constituting the composite language score and the SDQ total

difficulty score was $r = .40$ ($p < .001$). The correlation-coefficients were statistically significant for both boys ($r = .42$, $p < .001$) and girls ($r = .33$, $p < .001$).

Frequency of LP and NLP children

Based on the information from the 9072 children rated by teachers, 82.3 percent ($n = 7469$) obtained a zero score, i.e. they were judged as having no language problem on any of the four language items included. This applied to 77.2% ($n = 3563$) of the boys and 87.7 % ($n = 3906$) of the girls. According to the predefined 95 percentile criterion, 540 children were defined as having LP by their teachers, 67.8% boys ($n = 366$) and 32.2% girls ($n = 174$). This means that according to our definition, 7.9% of the boys and 3.9% of the girls in the total population were defined as having LP according to the definition used in the present study ($\chi^2 = 65.76$, $df = 1$, $n = 9072$, $p < .001$), i.e. boys had a two-fold increased risk as girls to be allocated to the LP group (OR = 2.03, CI = 1.71 - 2.42). The mean grade level in LP children ($M = 2.91$, $SD = 0.81$) was somewhat lower than for the NLP group ($M = 3.00$, $SD = 0.81$, $t = 2.44$, $p < .05$), but the effect size was negligible ($d = .11$).

LP and high scorers on the SDQ total difficulty score

A total of 50.6% of the children defined as having LP obtained a high total difficulty score (i.e. defining them as high scorers). This was true for 59.6% of the boys and 31.6% of the girls. The number of high scorers in the NLP group was 8.7%, which included 13% of the boys and 4.5% of the girls.

Language groups and the SDQ subscales: Overall results

Table 1 shows the results from the teacher reports on each SDQ subscale for children defined in the NLP and LP groups. The differences between the two groups were statistically significant on all subscales as reported by teachers ($p < .001$), with higher problem scores in the LP group. The accompanying effect sizes were large for the SDQ total difficulty score ($d = 1.72$), the Impact scale ($d = 2.04$), as well as all subscales: Emotional symptoms ($d = 1.09$), Conduct problems ($d = .87$), Hyperactivity-inattention ($d = 1.25$), Peer relationship problems ($d = 1.71$), Prosocial behaviour ($d = 1.00$).

Language problems and the SDQ subscales: Gender differences

In the NLP group, boys obtained significantly higher scores than girls on the total difficulty score and all subscales ($p < .001$), except for the Emotional symptoms subscale. The effect sizes were moderate for the SDQ total difficulty score ($d = .52$) and for the two subscales Hyperactivity-inattention ($d = .60$) and Prosocial behaviour ($d = .52$). Small effect sizes were noted for the subscales Conduct problems ($d = .39$) and Impact ($d = .29$), while a negligible effect size was noted for the subscale of Peer relationship problems ($d = .14$).

In the LP group the gender differences favouring girls were statistically significant on all subscales ($p < .001$) except for Emotional symptoms ($p = .88$), with moderate effect sizes on the SDQ total difficulty score ($d = .64$), the subscale Conduct problems ($d = .60$) and the Impact scale ($d = .52$). A high effect size was noted for the Hyperactivity-inattention subscale ($d = .81$), with higher problem score for boys than girls. Small to moderate effect sizes, favouring girls, was found for the subscales Peer relationship problems ($d = .37$) and Prosocial behaviour ($d = .47$).

Table 1: Mean and standard deviation (brackets) of the total SDQ difficulty score, the SDQ subscales and the impact score for children defined as LI by teachers and parents, respectively

	<i>NLP group</i>			<i>LP group</i>		
	<i>All</i>	<i>Boys</i>	<i>Girls</i>	<i>All</i>	<i>Boys</i>	<i>Girls</i>
Total teacher SDQ difficulty score	4.02 (4.40)**	4.99 (4.93)**	3.06 (3.57)	12.02 (7.29)	13.46 (7.35)**	8.98 (6.18)
Emotional problems	.60 (1.25) **	.58 (1.24)*	.62 (1.25)	2.05 (2.19)	2.07 (2.25)	2.00 (2.06)
Conduct problems	.61 (1.30)**	.84 (1.42)**	.37 (.93)	1.79 (2.03)	2.17 (2.13)**	.99 (1.55)
Hyperactivity-inattention	2.12 (2.30)**	2.78 (2.59)**	1.47 (1.75)	5.05 (3.04)	5.79 (2.95)**	3.49 (2.62)
Peer Relationship problems	.70 (1.32)**	.79 (1.43)**	.61 (1.20)	3.14 (2.61)	3.44 (2.71)**	2.49 (2.24)
Prosocial behaviour	8.44 (1.98)**	7.94 (2.19)**	8.93(1.59)	6.40 (2.71)	6.00 (2.66)**	7.24 (2.62)
Impact scale (teachers)	.34 (1.23)**	.51 (1.52)**	.16 (.81)	3.23 (3.14)	3.73 (3.22)**	2.18 (2.72)
Total parent SDQ difficulty score	5.54 (4.53)**	5.93 (4.78)**	5.12 (4.24)	11.99 (6.73)	12.62 (6.78)*	10.31(6.39)
Emotional problems	1.23(1.64) **	1.15 (1.61)**	1.31 (1.67)	2.31 (2.27)	2.33 (2.35)	2.25 (2.11)
Conduct problems	.90 (1.22)**	1.00 (1.32)**	.80 (1.11)	1.81 (1.83)	1.95 (1.84)	1.52(1.79)
Hyperactivity-inattention	2.54 (2.01)**	2.88 (2.21)**	2.21 (1.87)	4.70 (2.67)	5.13 (2.56)**	3.78 (2.70)
Peer Relationship problems	.85 (1.40)**	.89 (1.44)*	.80 (1.36)	3.07 (2.42)	3.21 (2.46)	2.77 (2.31)
Prosocial behaviour	8.56 (1.48)**	8.28 (1.57)**	8.83(1.32)	7.83 (1.99)	7.51 (2.05)**	8.53 (1.66)
Impact scale (parents)	.26 (1.19)**	.34 (1.37)**	.19 (.98)	2.45 (3.51)	2.82 (3.65)*	1.69 (3.08)

** : $p < .001$; * : $p < .05$; column 2 shows the differences between all children in the NLP and LP groups, while columns 3 shows the differences between boys and girls in the NLP group and column6 show the differences between boys and girls in the LP group.

Parent reports: Overall results

The mean language sum score of the language items was 0.29 ($SD = 0.91$) as reported by parents, with a statistically significantly higher score for boys ($M = 0.37$, $SD = 1.02$) than for girls ($M = 0.22$, $SD = 0.78$) ($t = 6.84$, $p < .001$, $d = .18$). The mean SDQ total difficulty score was 5.8 ($SD = 4.8$), with a significantly higher score for boys ($M = 6.3$, $SD = 5.1$) than for girls ($M = 5.27$, $SD = 4.4$, $t = 8.77$, $p < .001$).

According to the parents, 3.8% of the children were defined as having LP (boys = 4.8%, girls = 2.8%, $p < .001$) and 13.9% as high scorers according to the SDQ total difficulty score (boys = 17.0%, girls = 10.9%, $p < .001$). The parents reported significantly lower problem scores on all SDQ subscales in the LP group than in the NLP group (Table 1). In the NLP group, boys were reported with statistically significant higher problem scores than girls on all SDQ scales, while this was true only for the Hyperactivity-inattention subscale ($p < .001$), the Prosocial subscale ($p < .001$), the SDQ total difficulty scale ($p < .01$) and the Impact scale ($p < .02$) in the LP group.

Teacher and parent agreement

The correlation between the composite language score as reported by teachers and parents was statistically significant ($r = .55$, $p < .001$), both for boys ($r = .58$, $p < .001$) and girls ($r = .54$, $p < .001$). Statistically significant differences at the $p < .001$ level were confirmed for all grade levels. The agreement was also high on the SDQ total difficulty score ($r = .48$, $p < .001$), both for boys ($r = .51$, $p < .001$) and girls ($r = .38$, $p < .001$). However, the overall agreement between the teachers and parents was low when it comes to the definition of LP ($k = .39$, $p < .001$). The two informants only agreed on 39.1% of the LP children (boys = 38.5%, girls = 40.2%). The agreement was considerably higher in the NLP group, where parents and

teachers identified almost exactly the same children as having NLP (97.9 % agreement). The agreement was low for the definition of high and low-scorers on the SDQ total difficulty score ($k = .29, p < .001$). Almost nine out of ten parents agreed with the teachers when the teachers defined children as SDQ low scorers (89.4%), but the parents only confirmed the teacher definition of SDQ high scorers for 46.1% of these children (boys = 45.9%, girls = 46.8%).

When the teachers and parents agreed on the definition of LP ($n = 87$), their agreement regarding high scorers on SDQ was raised to 64.4% (boys = 65.1%, girls = 61.5%), but was reduced to 61.9% for the low scorers.

Discussion

The aim of the present study was to investigate how primary school teachers characterise behaviour-emotional function in pupils with co-occurring language problems. The results showed statistically significant correlations between the teachers' answers on the language items and the SDQ total difficulty score, for both boys and girls. However, more boys than girls were defined as having LP according to the teacher reports. Furthermore, the number of boys defined as having LP and high scores on the SDQ was substantially higher than for girls. The parents and teachers showed a poor agreement on the definition of LP and SDQ high scorers. However, when they did agree on defining a child as LP, they showed a substantially higher agreement of co-existing behaviour-emotional problems.

The finding that boys were twice as likely to be defined as having LP compared to girls was higher than expected from some recent studies (Biederman et al., 2005), but not from other studies (e.g., Kim-Cohen et al., 2005; Messer, Goodman, Rowe, Meltzer, & Maugham, 2006). We suspect that the frequency in the present study was at least partly influenced by our definition of LP, based solely on teacher reports on a very limited number

of language-related items. Earlier studies have mostly defined LP on the basis of many hours of standardized testing of the varieties and types of language function (Lindsay, Dockrell, & Strand, 2007). However, the aim of the present study was not to reveal the prevalence of LP in the population of primary school children, but to screen for the teachers' perception of language related problems and their association with behaviour-emotional problems.

There may be several limitations in using teacher ratings in evaluating a child's language abilities and associated behaviour-emotional problems (Lindsay, Dockrell, & Strand, 2007). Even so, we believe that teacher reports are important as a screening procedure for further referral to speech therapists or special help in the class. In the present study we found that almost 80% of the children defined as having LP had already been referred, and the WISC-III results in the case-control sample strongly indicated that most children defined as having LP also had cognitive problems. A study by Lindsay and Dockrell (Lindsay & Dockrell, 2000) showed that the comorbidity between language, behavioural and emotional problems is influenced by the severity of the language impairment as well as by the teacher's perspective. Other studies (Botting, 2004) have emphasized the importance of the child's cognitive function. In the study conducted by Botting, important differences were noted between children with language problems and a stable IQ versus those with falling IQ scores. Standardized tests seem to be needed to ensure that cognitive deficits associated with language problems are detected (Lundervold, Posserud, Sørensen, & Gillberg, 2007) and that the children receive adequate training and remediation (Glascoe, 2001). In other words, it is not possible to know if children defined as having LP in the present study had language problems of a specific nature or more general learning problems. Furthermore, from the data available we cannot ascertain if the non-referred children were misclassified or newly detected cases. Conversely, there may be children defined as having NLP who are misclassified. Still, we argue that overall, the results support the idea that when a teacher

reports language problems in their students, further investigations and help ought to be seriously considered.

The present study showed low agreement between parents and teachers on symptoms of behaviour-emotional problems, which is in accordance with earlier studies of mental health in children (Achenbach, McConaughy, & Howell, 1987; Kumpulainen et al., 1999; Posserud, Lundervold, & Gillberg, 2005). The study gave no information about the reliability of the information given by the two informants, and one cannot preclude informant biases.

Differences between parents and teacher reports may be due to an effect of situational context, since language problems as well as behaviour-emotional problems will manifest themselves differently at home and at school (Lindsay & Dockrell, 2004; Stormark, Heiervang, Heimann, Lundervold, & Gillberg, in press). However, when the two informants agreed upon a LP child, there was a high risk that the child also had co-existing behaviour-emotional problems. Some of the children identified with language problems by the teachers were not detected by the parents. The low agreement noted in the present study, if taken as a true difference between parents and teachers emphasized the importance of gathering information from both family and school in order to detect and remediate children with language problems.

In several studies, boys have been characterized by more externalizing (e.g. ADHD, ODD and CD) than internalizing (e.g. depression and anxiety) problems (Gaub & Carlson, 1997; Newcorn et al., 2001). The present findings were in accordance with these results. We confirmed that the number of boys reported to have symptoms of conduct disorder and symptoms of hyperactivity-inattention was significantly higher than for girls. Both the LP and NLP group revealed more behavioural symptoms among boys, with high effect sizes for gender in the LP group and small to moderate effect sizes in the NLP group. The results did not reveal significant gender differences on the SDQ subscale of emotional symptoms. It is possible, however, that the present study did not reflect gender differences in emotional

symptoms because the sample included only children aged 7 to 9 years. Symptoms of emotional problems will most often emerge later in adolescence (Gaub & Carlson, 1997; Gershon, 2002). When comparing the emotional symptoms scores in the LP and NLP group, both LP boys and girls show more problems. The high risk of emotional symptoms found in the LP group across gender was in accordance with findings in a recent study by Messer et al. (Messer, Goodman, Rowe, Meltzer, & Maughan, 2006).

The non-significant influence of grade level was somewhat surprising, in that other studies have reported that age influences language problems (Botting, 2004; Montgomery & Windsor, 2007). This may be explained by the restricted age range of the children included in the present study (7 – 9 years). Follow-up studies should explore the effect of age in more detail.

Strengths and limitations of the study

The main strengths of the study were the very large number of participants in the BCS, the fact that teachers evaluated all children over a short period of time, and that language function and behaviour-emotional problems were assessed within the same questionnaire and at the same point in time. The fact that the ratings for language and behaviour-emotional problems were produced by the same individual may, however, have inflated the relationship.

The main limitation of the study is the reliance on teacher reports to define LP, with no validation by more specific language tests. In other words, our definition relies on the assumption that the teachers were able to identify the type of impairment in question. One may suspect that the procedure would lead to an unreasonably high number of false positives. Due to the high risk of associated problems in children defined as having LP according to the teacher reports, it may still be important to refer these children to a formal psychological

assessment to differentiate between children with a more specific LP, behaviour-emotional disorder, and/or a more general learning disability.

Conclusions

Teacher ratings of problems related to language function are a common reason for referral of primary school children for further assessment and remediation. Thus, the teachers' awareness of these and related problems is of great importance. The present study indicates that the primary school teachers included showed a high degree of awareness of their pupils' language function, associated behavioural and emotional problems, and the impact of those problems on the children's everyday functioning. Further studies need to investigate if the teacher reports lead to a high number of false positive cases or cases in which their reports of LP disguise other problems. Gender should be an important variable in such studies. This is emphasized by the present findings that a higher number of boys than girls were defined as having LP and that the agreement between parents and teachers was much lower for girls than for boys.

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