Multi-informant scores and gender differences on the Strengths and Difficulties Questionnaire for New Zealand children

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The problems of New Zealand youth are significant, and increasing, but early intervention may assist children to avoid negative life outcomes. Teachers, parents, and students of 74 Year 6 children in five New Zealand primary schools completed the Strengths and Difficulties Questionnaire (SDQ). Between 2.7 and 5.5% of children sampled were identified as having total difficulties scores in the "abnormal" range, which is lower than norms established by other samples. Teacher ratings were lower than the ratings supplied by parents, which were lower than those given by students. Teacher ratings also varied by gender, with boys being identified as having more problems than girls. However, parent and student ratings showed little gender bias, suggesting that obtaining multiple informant information on the SDQ is useful, as it appears teachers are providing different information on students than parents or students themselves. We discuss the use of screening procedures, particularly in relation to the Vulnerable Children's initiatives.

Keywords: Strengths and Difficulties Questionnaire, children, identification, gender

The rate of adolescent mental health problems is high and increasing, especially for girls, both in England (Collishaw, Maughan, Natarajan, & Pickles, 2010) and New Zealand (Fleming et al., 2014). Additionally, only a small percentage of youth come in contact with mental health services (Muris, Meesters, & van den Berg, 2003). In a large-scale study of New Zealand secondary school students, 80% of the young people who were experiencing serious mental health problems had not sought help from a health professional (Mariu, Merry, Robinson, & Watson, 2011), with suicidal students, and those with substance-use problems, least likely to seek help. Early intervention can be helpful in reducing mental health difficulties for young people. For example, 14-year old Māori and Pacific students at risk of depression showed lower levels of depressive symptoms after a school-based intervention (Woods & Jose, 2011). Mariu and colleagues (2011) stress the importance of identifying adolescents who are having difficulties so that they may receive help.

Two of the present authors have previously argued that the key to effective and efficient human services for children and youth at risk is the adequacy of the methodology that brings them to notice in the first place. In Stanley and Sargisson (2012), we suggest that the systematic screening of age cohorts of school children is a logical and inexpensive approach to identification that promotes access and equity. Our recent work has focused on understanding how screening 'works' and, in particular, we have sought to find instruments that identify young people who are experiencing personal difficulties with reasonable reliability. In Sargisson, Stanley, and de Candole (2013) we report on the efficacy of early assessments of language skills, physical abilities, reading readiness, and behavioural issues in identifying children who had already been referred to Special Education (Ministry of Education). In this study, we showed the salience of physical abilities as an identifier, and in Sargisson, Powell, Stanley, and de Candole (2014) we describe the relationships that we have found for fine and gross motor scores and a number of other characteristics of children beginning primary school.

Most recently, we were asked to advise on an identification instrument for a Social Sector Trial (Ministry of Social Development). The Strengths and Difficulties Questionnaire (SDQ) was recommended and we took the opportunity to examine the performance of this popular screening device with a New Zealand sample. The SDQ is a 25-item survey with a teacher and parent version, and a student version for children who are 11 years of age and older. It has been extensively researched, is used with many different cultures, and has been translated into 69 languages (Lane, Menzies, Oakes, & Kalberg, 2012). The SDQ has been well received by teachers, who have found the SDQ to be acceptable and meaningful and who liked the fact that there were positive as well as negative items (Fletcher, Tannock, & Bishop, 2001). Moreover, this instrument is brief and simple to administer (Rothenberger & Woerner, 2004). It is also significant that the SDQ has been shown to be able to identify children with problems who might otherwise escape attention (Fletcher et al., 2001).

While there are three versions of the SDQ; teacher, parent, and self-report (student), there has been little research comparing the three informant versions. Many researchers who have used the SDQ have noted as a limitation the fact that they did not use all three informant versions (for example, Capron, Theron, & Duyme, 2007; Di Riso et al., 2010; Johnson, Hollis, Marlow, Simms, & Wolke, 2014; Muris et al., 2003; Rønning, Handegarard, Sourander, & Mørch, 2004; Syed, Hussein, & Mahmud, 2007).

Roberts, Attkisson, and Rosenblatt (1998), in a literature review of the

prevalence of psychiatric disorders of children and adolescents, state that it is important to obtain information from different informants, as it might lead to different estimates of the prevalence of psychiatric disorders. In a study of Norwegian foster children (Lehmann, Heiervang, Havik, & Havik, 2014), a higher mean SDQ total difficulty score (14.7) resulted from the parent version compared to the teacher version (11.9) but teacher and parent versions resulted in similar incidences of abnormal scores for 5 – 11 year old Pakistani children in a different study (Syed et al., 2009).

Teachers are more likely to report problems related to discipline and classroom behaviour (conduct and hyperactivity) whereas parents are more likely to report emotional symptoms (Syed, Hussein, & Haidry, 2009). Thus, teachers may provide important information on externalising problems, which may be useful in identifying conduct and hyperactivity problems, but may not be helpful in identifying internalising problems, such as depression. For example, Johnson et al. (2014) found that parents of 11-year old pre-term children in the UK and Ireland reported higher levels of problems on the SDQ with emotions, attention, and peer problems than teachers, while teacher ratings of conduct problems were more accurate than parent ratings. Johnson et al. conclude that the best predictions of mental health difficulties were achieved with multiple versions.

Rønning et al. (2004) recommend that, when used as a screening tool, a minimum of two informant versions should be used. They warn against using the self-report version in isolation, as self-report questionnaires are subject to various biases, such as social desirability. Goodman, Ford, Corbin, and Meltzer (2004) found that the best screen for psychiatric problems of British children in care is achieved by using all three versions but, if this is not possible, the parent and teacher combination is better than a combination of two ratings which includes the self-report SDQ. More evidence that the self-report SDQ should not be used in isolation was provided by Goodman, Meltzer, and Bailey (1998). They found, using only the self-report version, that children who were experiencing problems were not identified, and therefore, they advise that self-report SDQs should be used in combination with another informant version.

Syed et al. (2007) however, hypothesise that, for emotional symptoms, the self-report SDQ ought to produce more valid ratings than those of other informants. Children from a clinical sample aged around 12 years old identified more problems in the self-report SDQ than teachers did (Capron et al., 2007). In a clinical sample of German children, Becker, Hagenberg, Roessner, Woerner, and Rothenberger (2004) found that, overall, self-reports were more similar to parent reports than to teacher reports, and that adding the self-report ratings to either the parent or the teacher ratings improved the ability to predict psychological problems.

Using the SDQ, some researchers have found evidence for a greater prevalence of externalising problems, such as aggression, for boys, and a higher prevalence of internalising problems, such as anxiety and depression, for girls. For example, French boys aged around 12 years had higher scores for conduct and hyperactivity than girls; girls had higher scores for emotional symptoms (Capron et al., 2007). This pattern was evident on both the self-report and teacher versions of the SDQ (Capron et al., 2007). Similarly, using the self-report version of the SDQ, Dutch girls aged around 12 years had higher scores for emotional symptoms and prosocial behaviour but lower scores for conduct problems than boys did (Muris et al., 2003). Using the parent version, boys had higher total difficulties, hyperactivity-inattention and peer problems scores than girls, but girls had higher prosocial scores (Muris et al., 2003). Syed et al. (2009) say that, given that boys are reported to have higher rates of externalising problems than girls, boys may be more likely to be identified by teachers and that girls with emotional problems may be "neglected when it comes to intervention" (p. 626). While the prevalence of externalising problems does not appear to be increasing for adolescents, the prevalence of internalising problems is increasing for adolescent girls and the trend for boys is mixed (Bor, Dean, Najman, & Hayatbakhsh, 2014).

Other results are less equivocal on the presence of gender differences. Syed et al. (2007) found no significant difference between scores of emotional symptoms, peer problems or prosocial behaviour between girls and boys in Pakistan, but did find higher scores for boys on conduct and hyperactivity scales. Syed et al. (2009) reported higher scores for total difficulties, conduct, and hyperactivity for boys using the parent SDQ with Pakistani children, but teacher SDQ scores for the same children found gender differences for only the hyperactivity and prosocial scales, where boys had a higher incidence of problems.

We compared all three informant versions with Year 6 school children (mean age 11 years) in a town in the North Island of New Zealand. We aimed to assess differences in the scores on the SDQ as a function of informant version and also to examine gender differences in scores across informants.

Method

Participants

We invited all Year 6 (approximately 250) children from five primary schools in the research area to participate. From those invited, 38 female and 36 male Year 6 students participated (30% participation rate). Ages ranged from 10 to 11 (M = 11.06, SD = 0.28). Of the 74 children, 45 were Pākehā and 27 Māori. The five schools had decile ratings from 2 to 9, of a possible range from 1 to 10, where 1 represents the lowest 10% of families in terms of socio-economic status, and 10 the highest 10%.

Instruments

We used all three versions of the Australian SDQ for people aged between 11 – 17 years; teacher, parent, and self-report versions for each participating child. While some children in our sample were slightly younger than 11 years old, Curvis, McNulty, and Qualter (2014) found that children as young as 6 were able to complete the SDQ for 11 – 17 year olds. Evidence of reliability of the self-report and teacher versions of the SDQ for 11 – 17 year olds was provided by Capron et al. (2007) and these authors found that both the self-

report, and the teacher, versions of this SDQ discriminated at-risk students from students who were not receiving psychological care or failing in school. The reliability and validity of the SDQ for 11 – 17 year olds has been supported in numerous studies (e.g. Becker, Woerner, Hasselhorn, Banaschewski, & Rotherberger, 2004; Muris et al., 2003; Woerner et al., 2004).

Procedure

We provided information to, and secured willingness to be involved from, school principals during a regular monthly meeting. Information was then included in the school newsletter a week before the research pack containing the parent and child SDQ and a consent form was sent home. Parents who consented to their children participating completed the SDQ, assisted their child(ren) to complete the SDQ, signed the consent form and returned these documents to the school. The children's teachers completed the teacher SDQ in the fourth term of a four-term school year so teachers had time to become familiar with the children. The project received ethical approval from the Psychology Research and Ethics Committee of the University of Waikato (Approval #14:62).

Data Analysis

SDQ data were coded in Excel® according to instructions provided on the SDQ website http://www.sdqinfo.org/py/sdqinfo/c0.py. Statistical analyses were conducted in SPSS 21®. All scale scores were transformed by taking the square root of every value in order to facilitate the use of parametric tests, but untransformed data are shown in all figures. In all cases, higher numbers represent theoretically higher presence of the problem or strength measured by each scale. For example, higher total difficulty scores represent a greater presence of difficulties for the child.

Results

We ran a factorial multivariate analysis of variance (MANOVA), using gender as a between-subject independent variable and informant version as a repeated-measures independent variable for the three dependent measures of Total Difficulty (TD), Externalising (EXT), and Internalising (INT) scores. Using Pillai's trace, we found a significant effect of informant version on scores ($V = 0.93$, $F(6, 65) = 10.12$, $p < .001$). For all three measures (TD, EXT, and INT scores), scores differed significantly by informant (TD: $F(1.68, 117.86) = 34.73$, $p < .001$, $d = .70$; EXT: $F(1.71, 119.78) = 26.01$, $p < .001$, $d = .61$; INT: $F(1.65, 115.23) = 18.35$, $p < .001$, $d = .51$)[1] , with the lowest scores given by teachers, and the highest by students, as shown in Figure 1. For all three measures, Bonferroni post-hoc tests showed that teacher scores were significantly different from both parent and student scores ($p < .001$). Parent scores differed from student scores for TD ($p < .05$) but not for EXT ($p = .41$) or INT ($p = .23$) scores.

Figure 1 shows TD, EXT, and INT scores for male and female students for the three informants. According to the MANOVA, there was no significant main effect of gender on scores ($V = 0.06$, $F(3, 68) = 1.31$, $p = .28$), but there was a significant interaction between gender and informant version ($V = 0.24$, $F(6, 65) = 3.49$, $p = .005$). Univariate ANOVA revealed significant interactions between gender and informant version for TD ($F(1.68, 117.86) = 8.25$, $p = .001$, $d = .34$) and EXT scores ($F(1.71, 119.78) = 11.82$, $p < .001$, $d = .41$) but not for INT scores ($F(1.65, 115.23) = 1.04$, $p = .34$, $d = .12$). However, while statistical power was high (>.9) for all other tests, for the interaction effect of informant version and gender for INT scores, power was only .37, which may indicate that there is a real interaction that was undetected in this instance due to low statistical power.

Figure 1 shows that teacher versions resulted in higher TD and EXT scores for male compared to female students, but there was little difference between the TD and EXT scores of boys and girls according to parents or according to the students themselves. The mean INT scores for female and male students were more similar across the three informant versions than were TD and EXT scores. Correlations between TD scores for different informants were all significant, with the strongest positive correlation being between parents and students ($r(71) = .67$, $rs(71) = .62$, $p < .001$), followed by parents and teachers ($r(71) = .41$, $rs(71) = .44$, $p < .001$), with the weakest correlation between teacher and student versions ($r(71) = .28$, $p = .02$; $rs(71) = .30$, $p = .01$).

Figure 2 shows mean scores on the subscales of emotional symptoms, conduct problems, hyperactivity, and peer problems for boys (filled circles) and girls (empty circles) according to the three informants. In all cases, the students rated themselves as having higher levels of problems than parents, who, in turn, rated the students as having more problems than teachers did. For emotional symptoms, hyperactivity, and conduct, the teacher versions resulted in higher scores for boys compared to girls, but parent and student versions produced similar scores for boys and girls. Mean scores for peer problems did not differ much according to gender. Mean prosocial scores (not shown here) were high (>8 of a possible 10) for both genders for all informants.

Discussion

If TD score were to be used to identify children at risk, somewhere between 2.7 and 5.5% of children would be identified as at risk in our sample, depending on which informant version was used. These prevalence rates are similar to those found for a sample of British children aged between 11-16 years old (Goodman et al, 1998) and a sample of New Zealand 13 – 17 year olds (Black, Pulford, Christie, & Wheeler, 2010), but lower than rates found by other researchers (e.g. Johnson et al., 2014; Mellor, 2005), and lower than the 9.3% prevalence of student-informant abnormal total difficulties scores reported for a sample of New Zealand secondary school students in 2012 (Fleming et al., 2014).

Achenbach, McConaughy, and Howell (1987), in a meta-analysis of 119 studies, found the average correlation between parent and teacher ratings of child and adolescent problems to be 0.27, between parent and child to be 0.25, and between teacher and child, 0.20. In our

1 Note that because the assumption of sphericity was violated for informant version, and the Greenhouse-Geisser estimate was greater than .75, the Huynh-Feldt correction was used to adjust the degrees of freedom (Huynh & Feldt, 1976).

Figure 1. Mean Total Difficulty, externalising, and internalising scores for male and female students for each of three informants; teachers, parents, and students. Error bars represent the standard error of the mean.

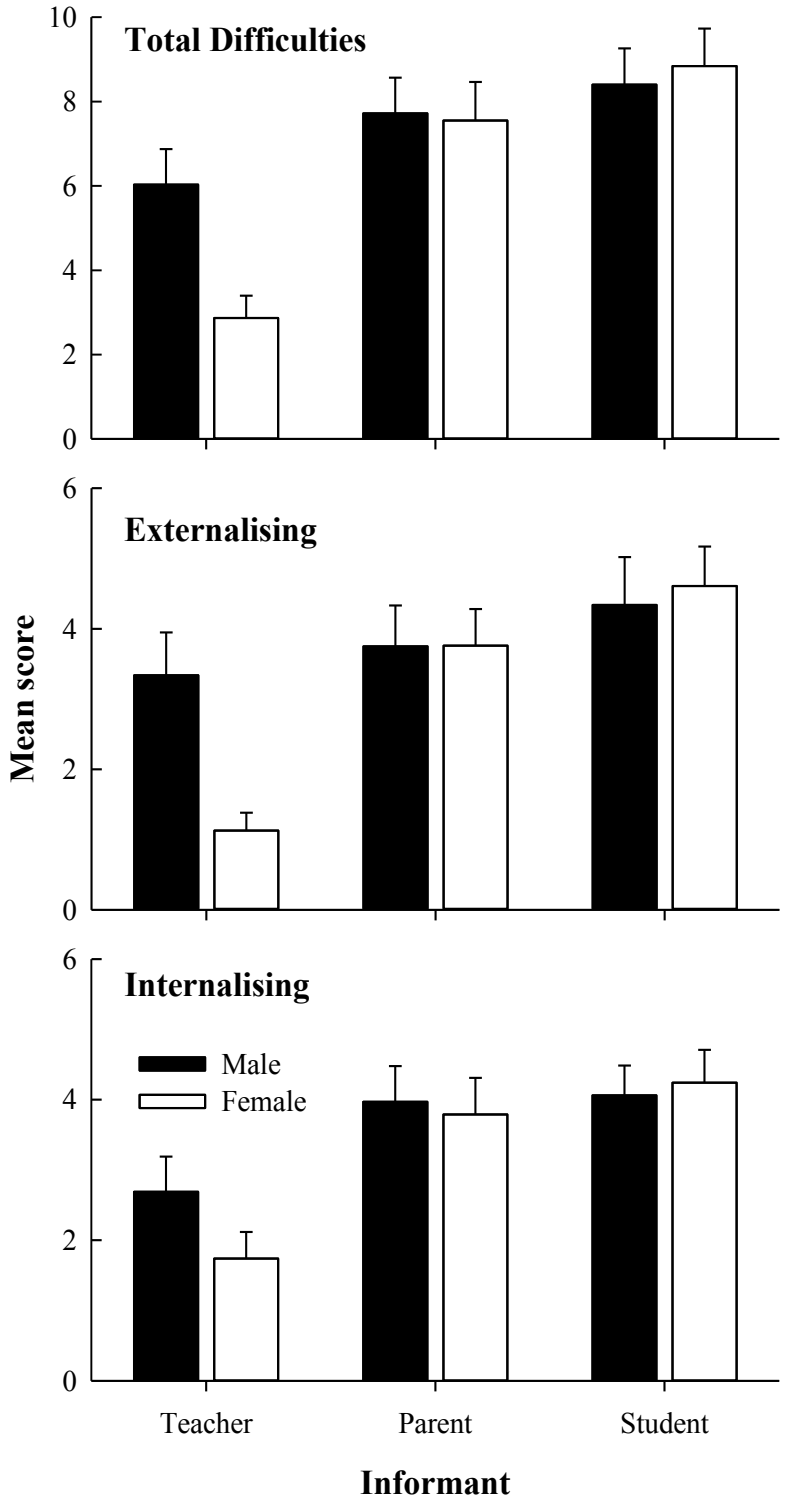
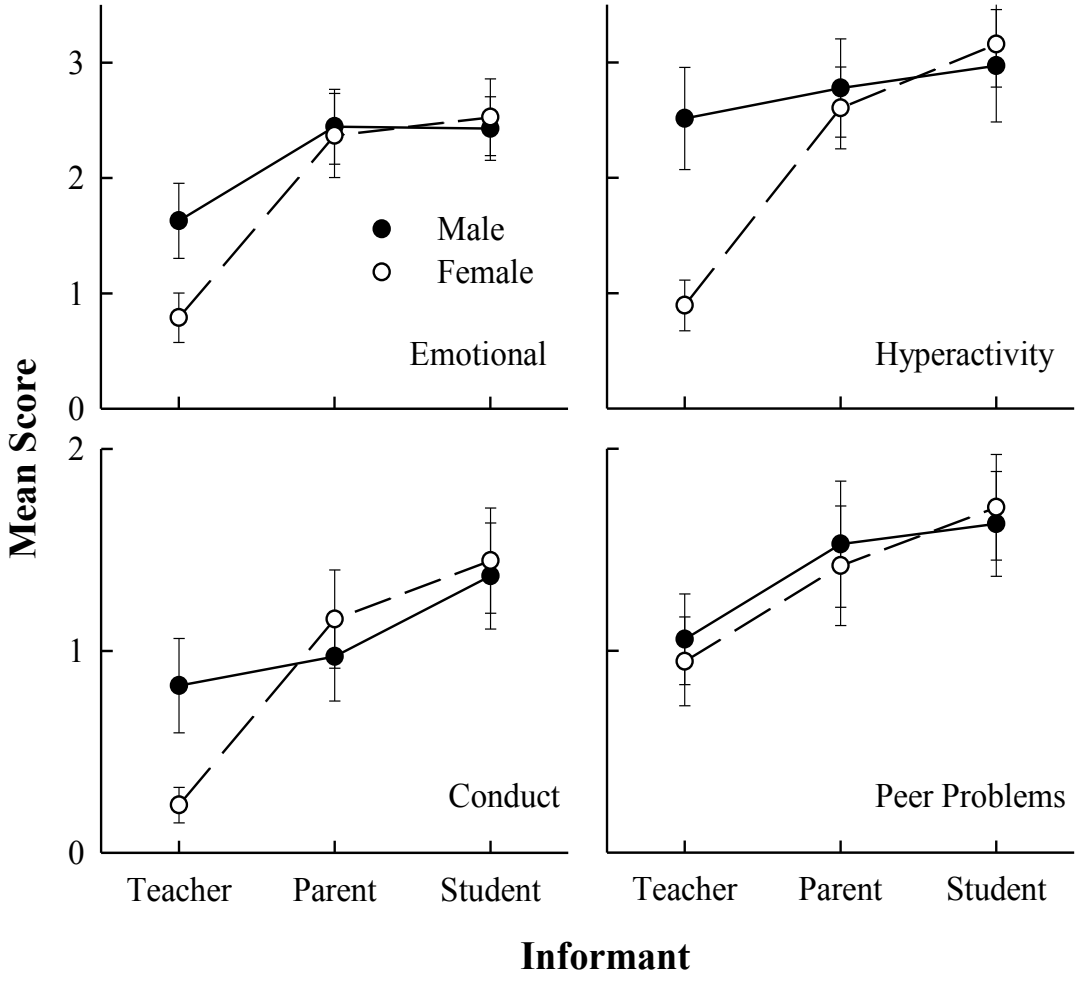


Figure 2. Mean scores on the emotional symptom, conduct problems, hyperactivity, and peer problem subscales for boys (filled circles) and girls (empty circles) by informant. Error bars represent the standard error of the mean. (Note that the y-axis scale for the top two graphs differs from that of the bottom two.)



sample, the correlation between parent and student total difficulty scores was much stronger than these averages. The correlation between teacher and parent was weaker, with the weakest correlation between teacher and student ratings. These findings, and those of Goodman et al. (1998) suggest that, if teacher ratings are being gathered, it is useful to include either a student or parent version, as these informants are supplying different information.

Dirks, Boyle, and Georgiades (2011) have suggested that, while parent and teacher ratings are based on different samples of behaviour, that is, behaviour differs at school and at home, other factors will influence the difference between parent and teacher ratings. For example, while parents spend extended periods with their children and with few other children, teachers spend less time with a larger number of children, so may be better placed to compare a child's behaviour with that of other children. Thus, for teachers, a child's behaviour needs to be more severe to be noticed, and may, therefore, be a stronger predictor of later problems. If this is case, then there is more to be gained from collecting two disparate assessments (teacher and parent, or teacher and student), than by obtaining two contextually similar assessments (parent and student). The research findings of Ferdinand, van der Ende, and Verhulst (2007) support this position, as they found that while parents were better predictors of poor outcomes for children than teachers, the predictions were improved by adding teacher-provided information. Goodman et al. (2004) recommend that if two informant versions of the SDQ are to be used, then the best combination is teacher and parent. Omitting the student version, they say, results in missing some children with emotional disorders.

The level of difficulties reported for the students in our sample, however, were highest when reported by students themselves. These findings were similar to those of several studies (e.g. Borg, Kaukonen, Joukamaa, & Tamminen, 2014; Capron et al., 2007; Johnson et al., 2014; Mellor, 2005; Sawyer, Baghurst, & Mathias, 1992), and seem to suggest that self-report SDQ results are not subject to social desirability biases, as suggested by Rønning et al. (2004). Conversely, Becker, Hagenberg, et al. (2004) found that the total difficulties scores of children from a German clinical sample were lower than the scores provided by their parents, and very similar to the scores provided by their teachers. De Los Reyes and Kazdin (2005), in a review of research on child assessment, note that informant disagreement is common and that little is known about why informant ratings are discrepant. Discrepant ratings may not indicate that one or more informant is unreliable, but that children's behaviour differs by context (Achenbach et al., 1987), as found by De Los Reyes, Henry, Tolan, and Wakschlag (2009) with preschool children. Indeed, Ferdinand, van der Ende, and Verhulst (2004) found that disagreements between parent and adolescent ratings of behaviour can even predict outcomes for those adolescents four years later. For example, Ferdinand et al. (2004) found that adolescents who rated themselves much higher for the presence of attention problems than their parents were much more likely to have been referred to mental health services in the four years following the measurement. Agreement between teacher and parent ratings is higher for younger children (under 12 years) than for adolescents, possibly because the behaviour of younger children is more consistent across different contexts (De Los Reyes & Kazdin, 2005), suggesting that multi-informant versions become more important with advancing age.

Figures 1 and 2 show that when the SDQ was completed by teachers, boys' scores were higher than girls', but that there was no difference between boys and girls when the SDQ was completed by parents or students. Researchers have shown a tendency for teachers (and sometimes parents) to report higher levels of externalising difficulties for boys than for girls (e.g. Capron et al., 2007; Graves, Blake, & Kim, 2012; Sawyer et al., 1992; Woerner et al., 2004). Soles, Bloom, Heath, and Karagiannakis (2008) also reported that teachers nominate more boys than girls for referrals and that those referrals are based largely on externalising problems. Given that our parents and students did not appear to detect a lower rate of externalising problems for girls, it is either the case that teachers do not notice the externalising problems of girls, or, more probably, that girls exhibit externalising behaviours to a greater extent outside of the classroom environment, and that these behaviours are not exhibited in the presence of teachers. Interestingly, Davé, Nazareth, Senior, and Sherr (2008) found that fathers report higher levels of externalising behaviours for their preschool boys than for girls but the ratings of mothers of the same children did not differ by gender. The authors suggest that fathers may be more susceptible to gender stereotyped expectations of their children's behaviour than are mothers, but it could also be the case that girls exhibit fewer externalising behaviours in the presence of their fathers than in the presence of their mothers. Whatever the reason for the difference in perception of difficulties of boys and girls, it seems important to collect student responses to the SDQ, as students may be more aware of their behaviour in multiple contexts. Additionally, given that any screening process should be child-focused, it is respectful to the young person to include their perception of themselves and their problems. More research into the behaviour of girls and boys in different contexts would help to identify which context is most predictive of future problems for young people, and would contribute to understanding whether and why children behave differently in different contexts (Graves et al., 2012).

Conclusion

We welcomed the opportunity provided by the Ministry of Education, the Ministry of Social Development, and a Social Sector Trial to assess the performance of the SDQ with a local sample. Our investigation suggests that it would be more efficacious to use two informant versions of the SDQ, rather than a single version to identify children at risk from psychological problems. For ease of administration, and to gather the two most disparate perspectives of behaviour, we recommend administering both the teacher and self-report (student) versions of the SDQ. As well, asking young people how they view their circumstances is respectful of them. Our results suggest that reliance on

teacher referral of children seems likely to result in a lower rate of referral of girls. Whether or not a lower referral rate is problematic for girls, and whether girls' behaviour varies more by context than does boys' behaviour, remains a topic for future research.

It may be helpful to discuss more generally the place of systematic screening in the context of the Vulnerable Children's initiatives (New Zealand Government, n. d.; New Zealand Government, 2012), to which our Social Sector Trial relates. A major advance of Children's Teams is that there are to be structures and processes for the sharing of information concerning young people and families experiencing difficulties across professionals and agencies. However, Children's Teams are dependent on intake processes to obtain clients (Children's Action Plan, 2014), and service delivery systems that are dependent on intakes are beset by an array of conceptual, logistical, and procedural challenges (Stanley & Sargisson, 2012, provide a summary of these issues). Most importantly, in some situations it is unlikely that servicing based on intake approaches can respond to the size and seriousness of the problems that they are expected to address. For instance, Growing Up in New Zealand researchers have found that only one fifth of families whose children are especially likely to be vulnerable to health and behavioural problems had received assistance during their first 100 days of life from social support services (Growing Up in New Zealand News, 2015). Furthermore, other experience in longitudinal human development research, both here and overseas, makes plain how difficult it is to obtain, and to retain, the most at-risk participants in an investigation (Schoon, 2006; Stanley, 2010).

Such potential concerns about the prevalence, and the severity, of difficulties amongst school-aged children can only be addressed by systematic screening; and when these data are available it is then possible to make rational decisions about the deployment of staff and the utilisation of other resources. Nevertheless, there is a recurring worry that screening produces false positives and that children will be stigmatised. Kauffman and Landrum (2013) argue, however, that the real problem is false negatives (which occur more often). We know that young people with difficulties who are not identified can go on to be problems to themselves and others throughout much of their lives, and we also have available evidence-based programmes such as the Incredible Years series (http://www.incredibleyears.com) that can regularly realign maladaptive developmental trajectories when implemented with fidelity. In addition, screening devices like the SDQ assess children's personal assets, as well as the presence of challenges, and any further determination of the need for assistance should always be reliant on professional assessment and judgment as currently occurs.

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