

Differences in New Zealand Secondary School Students' reported Strengths and Difficulties

Stella Black, Waitemata District Health Board, Auckland

Justin Pulford, AUT University

Grant Christie, Waitemata District Health Board

Amanda Wheeler, Waitemata District Health Board

The Strengths and Difficulties Questionnaire (SDQ) is a behavioural screening questionnaire developed specifically for children and adolescents. This paper presents SDQ scores for a sample of 484 New Zealand secondary school students aged 13-17 and examines the relationship between SDQ score, ethnicity, age, gender, and alcohol and cannabis use. We found that only 4% of our sample of secondary school students fell within the 'abnormal' range and that difficulties, as reported via the SDQ, appeared greater amongst younger adolescents (13-15 yrs) and did not vary by ethnicity. Our results support further validation of the SDQ within a random New Zealand community sample and suggest that practitioners should be cautious when interpreting SDQ symptom scores particularly in older adolescents.

The Strengths and Difficulties Questionnaire (SDQ) is a brief behavioural screening instrument designed to provide a profile of child and adolescent (3-17 year olds) behaviour, emotions and relationships (Goodman, 1994). Although utilised extensively in child and adolescent mental health (CAMHS) and health services in New Zealand, as yet there is no published data reporting psychometric properties of the SDQ in a New Zealand population (Merry et al., 2004)

This paper presents a secondary analysis of SDQ data collected as part of a larger study that tested a new youth alcohol and other drug (AOD) screening instrument, the Substances and Choices Scale (SACS) - see www.sacsinfo.com for more information (Christie et al., 2007). The SACS was designed to share a similar structure to the SDQ in light of the latter's high regard amongst CAMHS workers and its acceptability to young people and their families (including Māori rangatahi and whānau) (Merry, et al., 2004). The intention was for the SACS and SDQ to be used together to provide a broad overview of a young person's functioning across

a range of domains.

The SDQ is a multiple informant instrument, useful for providing an overview of a children and adolescent's behaviour, focussing on their strengths as well as difficulties. The reliability and validity of the SDQ has been confirmed in a variety of settings and jurisdictions (Goodman, 1997; Goodman, 2001; Goodman, Ford, Simmons, Gatward, & Meltzer, 2000; Klasen et al., 2000; Mellor, 2005; Muris, Meester, & Van den Berg, 2003; Zwirs, Burger, Schulpen, & Buitelaar, 2006). Normative data for the SDQ has been widely reported in Britain and North America (Bourdon, Goodman, Rae, Simpson, & Koretz, 2005; Goodman, 1997; Goodman, 2001; Goodman, et al., 2000; Obel et al., 2004). Australian data is also available (Mellor, 2005) and may be seen by practitioners as most relevant for New Zealand services.

Test scores from other countries have been reported less often, although this is of interest as there is some evidence that SDQ scores may vary by ethnicity (Achenbach et al., 2008; Sagatun, Lien, Sogaard, Bjertness, &

Heyerdahl, 2008; Woerner, Becker, & Rothenberger, 2004). Identification of ethnic differences in SDQ score, where such differences exist, may assist both health workers at the coalface and policy makers to better provide appropriate treatment for ethnic minorities in multiethnic societies (Zwirs, et al., 2006).

In this paper we report test results for the self-reported version of the SDQ as obtained from a sample of New Zealand secondary school students and examine possible differences in SDQ scores by ethnicity. Differences in SDQ scores related to age, gender and alcohol or cannabis use are also examined.

Methodology

The SDQ questionnaire consists of twenty-five statements to which the response 'Certainly True', 'Somewhat True' or 'Definitely Not True' is scored from 0, 1 or 2. The 25 items are categorised into five scales measuring emotional symptoms, conduct problems, hyperactivity/inattention, peer relationship problems, and prosocial behaviour, including helping, sharing and caring. These psychological attributes are either positively or negatively scored to generate a total 'difficulties' rating ranging from 0 to 40. On the self-reported version of the SDQ a total difficulties score in the 0-15 range is considered 'normal', a score in the 16-19 range 'borderline' and a score in the 20-40 range 'abnormal' as per the published website guidelines (<http://www.sdqinfo.com>). There are three

Table 1. Participant demographics

Variable		Outcome
Mean age: yrs (<i>SD</i>)		15 (1.3)
Gender: <i>n</i> (%)	Male	247 (51)
	Female	237 (49)
Ethnicity: <i>n</i> (%)	European	223 (45)
	Māori	47 (10)
	Pacific	64 (13)
	Asian	139 (29)
	Other	11 (3)
Decile rating: <i>n</i> (%)	Decile 3	175 (36)
	Decile 7	119 (25)
	Decile 10	190 (39)
Past month alcohol use: <i>n</i> (%)		208 (44)
Past month cannabis use: <i>n</i> (%)		53 (11)

versions of the SDQ: parent, teacher and self-report (11-17 year olds), the latter being the only version available for analysis in this study (Goodman, et al., 2000).

This original SACS study was approved by a Ministry of Health, Health and Disability Ethics Committee. Data from the psychometric testing stage of the SACS study (Christie, et al., 2007) was used for the analysis. This stage involved 489 secondary school students recruited from three co-educational Auckland schools with contrasting socioeconomic and ethnic profiles. The schools had decile ratings of three, seven and ten; a decile rating indicates the extent to which a school draws its students from low socio-economic communities. Schools in the lowest deciles (1-3) draw their

students from communities with the highest degree of socio-economic disadvantage, while those in the highest deciles (8-10) draw the least from these communities (Ministry of Education, 2010). Two classes of contrasting academic ability were selected from each of the school's five year groups (Christie, et al., 2007).

Passive parental consent was sought from participants one week prior to the research and participants written informed consent obtained on the day. Participants were asked to complete the SDQ as part of a suite of measurement tools including a demographic form, the CRAFFT questionnaire (Knight, Sherrit, Harris, Gates, & Chang, 2003) or the POSIT questionnaire (Latimer, Winters, & Stinchfield, 1997), the newly developed SACS instrument and

a feedback form.

De-identified questionnaires were collected and data entered and checked. Statistical analysis (descriptive statistics and binary regression analysis) was undertaken using SPSS version 13.0. SDQ scores from those students aged 13 – 17 was used for the secondary analysis reported here.

Results

Table 1 displays the demographic characteristics of the sample.

Table 2 presents the mean score and standard deviation for each of the five SDQ scales and the total difficulties score. Also presented are the percentage of participants whose total difficulties SDQ score fell within the 'borderline' and 'abnormal' range as determined by published cut off scores on the SDQ website (see www.sdqinfo.com). Comparison data from British and Australian studies reporting normative data is also provided for comparison (Goodman, et al., 2000; Mellor, 2005).

Excluding the 13 year olds data from our sample and reanalysing the descriptive data by gender yielded norms that are able to be compared directly with published normative data for Australia as shown in Table 3.

Binary regression analysis was used to predict a borderline or abnormal total difficulties score of 16 or higher (which represents borderline or abnormal functioning) from age (<16 vs. 16+), gender (male vs. female), ethnicity (New Zealand European vs. other, Māori vs. other, Pacific Island vs. other, and Asian

Table 2. SDQ scores including percentages of responses falling within published guidelines suggesting borderline or abnormal functioning with comparison data from Britain and Australia

Sample (<i>n</i>)	British*	Australian**	New Zealand	New Zealand 'case' bandings			
	(4228)	(553)	(484)				
Age	11-15	11-17	13-17	Borderline (top 20%)		Abnormal (top 10%)	
SDQ scores	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>Cut score</i>	%	<i>Cut score</i>	%
Emotional symptoms	2.8 (2.1)	2.4 (2.0)	2.7 (2.1)	(6)	6	(7-10)	6
Conduct Problems	2.2 (1.7)	1.8 (1.7)	2.1 (1.6)	(4)	9	(5-10)	11
Hyperactivity	3.8 (2.2)	3.2 (2.3)	3.7 (2.2)	(6)	6	(7-10)	10
Peer problems	1.5 (1.4)	1.5 (1.6)	1.7 (1.5)	(3-4)	10	(6-10)	2
Prosocial behaviour	8.0 (1.7)	8.0 (1.7)	7.6 (1.6)	(5)	12	(0-4)	3
Total Difficulties	10.3 (5.2)	9.0 (5.6)	10.2 (5.0)	(16-19)	12	(20-40)	4

*(<http://www.sdqinfo/bb1.html>; Meltzer, Gatward, Goodman, & Ford, 2000); **(Mellor, 2005)

Table 3. Comparative means and standard deviations (SD) of New Zealand and Australian SDQ self-report scores for 14-17 year old males and females

Gender (n)	New Zealand		Australia*	
	Male (201)	Female (193)	Male (115)	Female (146)
SDQ scores	Mean (SD)			
Emotional Symptoms	2.1 (1.9)	3.4 (2.1)	2.1 (2.0)	2.9 (1.9)
Conduct Problems	2.2 (1.7)	1.8 (1.5)	2.4 (1.9)	1.7 (1.5)
Hyperactivity	3.8 (2.2)	3.7 (2.1)	4.0 (2.4)	3.1 (2.2)
Peer Problems	1.9 (1.5)	1.5 (1.4)	1.6 (1.6)	1.4 (1.4)
Prosocial Behaviour	7.2 (1.6)	8.1 (1.5)	7.3 (1.8)	8.4 (1.6)
Total Difficulties	9.9 (5.1)	10.4 (4.9)	10.1 (6.0)	7.8 (5.9)

* (Mellor, 2005).

vs. other), past month alcohol use (any use vs. no use) and past month cannabis use (any use vs. no use). Results are presented in Table 4. Ethnicity, gender and cannabis use were not predictive of borderline or abnormal total difficulties, although age and past month alcohol use were. The odds of scoring 16 or higher on the SDQ increased by a factor of 1.83 for participants younger than 16 years of age, whereas participants who had not consumed alcohol in the past month were less likely to score 16 or higher on the SDQ by a factor of 0.52.

Discussion

This paper outlines what a New Zealand population of young people perceived their strengths and difficulties as measured by the SDQ. The results demonstrate that in this sample the SDQ scores were dissimilar from published norms from other jurisdictions, highlighting the need to establish the validity of the SDQ in New Zealand children and adolescents and further evaluate the use of the SDQ in practice.

The test results indicated that

84% of the participants SDQ total difficulties score were in the normal range with only 4% 'abnormal'. In this analysis a total difficulties score of 16 was used as a cut off, however in other validation studies SDQ cut-offs have been established using the 90th percentile yielding a cut off score for abnormality in the total difficulties scale ranging from 17-19 (Koskelainen, Sourander, & Vauras, 2001; Ronning, Handergaard, Sourander, & Morch, 2004; Van Roy, Groholt, Heyerdahl, & Clench-Aas, 2006). Our results would suggest that the published cut-off scores indicating 'abnormality' are unlikely to be representative of the top 10% of scores in a New Zealand community sample.

Published normative data for the SDQ varies by population with different studies reporting on different age and sex bands. For example British means and standard deviations are reported on the *sdqinfo.com* website for 11-15 year olds, however Australian data reported for 14-17 year olds in specific gender bands. To facilitate comparison of the New Zealand and Australian

data we have reported the means and standard deviations for the specific age and gender bands reported by Mellor (2005) as shown in Table 3. Although there are many similarities, more interesting are the differences, in particular New Zealand males reporting higher levels of peer problems. In addition New Zealand females report more emotional symptoms and total difficulties compared to their Australian counterparts. This is of potential interest and may reflect sampling differences or actual morbidity but reinforces the importance of establishing high quality normative data for New Zealand practitioners.

Age was the only demographic variable found to be predictive of SDQ score in this analysis. Younger adolescents (13-15) appeared to be more likely to score highly on the SDQ, however as we know that prevalence of mental health disorder increases with age over adolescence, this may suggest that the SDQ is less effective at identifying possible difficulties in older adolescents. As the SDQ is an instrument that spans a wide developmental range (from 5 to 17) it would not be unexpected for this to be the case. Alternatively the difference may reflect the attributes of our sample, as school students with more difficulties are less likely to remain enrolled in their 16th and 17th years.

Differences in SDQ score based on gender and ethnicity have been reported in other countries and we know from New Zealand survey's that Māori and Pacific peoples are at most risk for a range of mental health disorders (Bourdon, et al., 2005; Koskelainen, Sourander, & Kaljonen, 2000; Oakley

Table 4. Odd ratios for SDQ total difficulties score of 16+

Variable	OR (95%CI)	P
Age	1.83 (1.03, 3.24)	0.04
Gender	0.99 (0.59, 1.66)	0.97
Ethnicity		
NZ European	1.29 (0.16, 10.58)	0.81
Māori	2.36 (0.26, 21.30)	0.45
Pacific Island	1.33 (0.15, 12.17)	0.80
Asian	2.09 (0.25, 17.17)	0.49
Alcohol use in past month	0.52 (0.28, 0.96)	0.04
Cannabis use in past month	0.58 (0.28, 1.22)	0.15

Browne, Wells, & Scott, 2006; Van Roy, Groholt, Heyerdahl, & Clench-Aas, 2006). The failure to identify any relationship between gender or ethnicity and SDQ scores in this sample of students may represent a limitation of the SDQ when used in New Zealand young people and warrants further investigation.

In our sample 44% of the young people reported having drunk alcohol in the past month and this mirrors the current youth drinking as reported in the Youth 2007 study where 34% of New Zealand secondary school students report a drinking binge of 5 or more drinks in the last month (Adolescent Health Research Group, 2008). Our finding that alcohol users were more likely than their non-alcohol using counterparts to report emotional difficulties supports recent concern about the detrimental effects of teenage drinking (AAP Committee on Substance Abuse, 2001; Law Commission, 2010).

Cannabis use in the past month did not prove to be predictive of an SDQ total difficulties score of 16 or higher despite cannabis use often being associated with mental health or behavioural issues in youth (Hall, 2006). This finding may be attributable to the low number of participants (11%) who reported past month cannabis use.

There are several limitations of this study. The reported findings were based on a secondary analysis of the youth self-reported SDQ data and our results need to be interpreted with the consideration that the original purpose of the study was not to provide normative data, but rather to test the validity and reliability of another screening instrument. In addition it is unlikely that the sample is a true representation of the New Zealand youth population as the young people were recruited from just three Auckland based secondary schools. Of the participating schools, the decile 10 school had a large proportion of students and they were disproportionately Asian. The fact that only the self-report SDQ was used in this study also limits the usefulness of the data produced, given the fact that the SDQ is designed as a multiple informant questionnaire.

Despite these limitations, our findings that only 4% of the sample of secondary school students fell within

the 'abnormal' range suggest that the published cut-off scores indicating 'abnormality' or the top 10% are unlikely to be applicable in a New Zealand community sample and that practitioners should be cautious when interpreting SDQ symptom scores. Furthermore our results suggest that difficulties, as reported via the SDQ, appear greater amongst younger adolescents (13-15 yrs) and this may represent a limitation regarding the application of the SDQ in older adolescents. Our results support the need for validation of the SDQ within a random New Zealand community sample including rural/provincial young people using all three SDQ informant versions.

References

- AAP Committee on Substance Abuse. (2001). Policy statement: alcohol use by youth and adolescents: a pediatric concern. *American Academy of Pediatrics*, 125, 1078-1087.
- Achenbach, T., Becker, A., Döpfner, M., Heiervang, E., Roessner, V., Steinhausen, H., et al. (2008). Multicultural assessment of child and adolescent psychopathology with ASEBA and SDQ instruments: research findings, applications, and future directions. *The Journal of Child Psychology and Psychiatry*, 49, 251-275.
- Adolescent Health Research Group. (2008). *Youth '07: the health and wellbeing of secondary school Students in New Zealand. Initial Findings*. Auckland: The University of Auckland.
- Bourdon, K., Goodman, R., Rae, D., Simpson, G., & Koretz, D. (2005). The Strengths and Difficulties Questionnaire: US normative data and psychometric properties. *American Academy of Child and Adolescent Psychiatry*, 44, 557-564.
- Christie, G., Marsh, R., Sheridan, J., Wheeler, A., Suaalii-Sauni, T., Black, S., et al. (2007). The Substances and Choices Scale (SACS) - the development and testing of a new alcohol and other drug screening and outcome measurement instrument for young people. *Addiction*, 102, 1390-1398.
- Goodman, R. (21 Feb 2001). SDQ: normative SDQ data from Britain. Retrieved 17 May, 2010, from <http://www.sdqinfo.com/bb1.html>
- Goodman, R. (1994). A modified version of the Rutter Parent Questionnaire including extra items on childrens

- strengths: a research note. *Journal of Child Psychology and Psychiatry*, 35, 1483-1494.
- Goodman, R. (1997). The Strengths and Difficulties Questionnaire; a research note. *Journal of Child Psychology and Psychiatry*, 38, 581-586.
- Goodman, R. (2001). Psychometric properties of the Strengths and Difficulties Questionnaire. *American Academy of Child and Adolescent Psychiatry*, 40, 1337-1345.
- Goodman, R., Ford, T., Simmons, H., Gatward, R., & Meltzer, H. (2000). Using the Strengths and Difficulties Questionnaire (SDQ) to screen for child psychiatric disorders in a community sample. *British Journal of Psychiatry*, 177, 534-539.
- Hall, W. (2006). Cannabis use and the mental health of young people. *Australian and New Zealand Journal of Psychiatry*, 40, 105-113.
- Klasen, H., Woerner, W., Wolke, D., Meyer, R., Overmeyer, S., Kaschnitz, W., et al. (2000). Comparing the German versions of the Strengths and Difficulties Questionnaire (SDQ-Deu) and the Child Behavior Checklist. *European Child and Adolescent Psychiatry*, 9, 271-276.
- Knight, J., Sherrit, L., Harris, S., Gates, E., & Chang, G. (2003). Validity of brief alcohol screening tests among adolescents: a comparison of the AUDIT, POSIT, CAGE, and CRAFFT. *Alcoholism: Clinical & Experimental Research*, 27
- Koskelainen, M., Sourander, A., & Kaljonen, A. (2000). The Strengths and Difficulties Questionnaire among Finnish school-aged children and adolescents. *European Child and Adolescent Psychiatry*, 9, 277-284.
- Latimer, W., Winters, K., & Stinchfield, R. (1997). Screening for drug abuse among adolescents in clinical and correctional settings using the Problem-Oriented Screening Instrument for Teenagers. *American Journal of Drug and Alcohol Abuse*, 23, 19-98.
- Law Commission. (2010). *Alcohol in our lives : curbing the harm. a report on the review of the regulatory framework for the sale and supply of liquor*. (NZLC R114). Wellington: Law Commission.
- Mellor, D. (2005). Normative data for the Strengths and Difficulties Questionnaire in Australia. *Australian Psychologist*, 40, 215-222.
- Meltzer, H., Gatward, R., Goodman, R., & Ford, F. (2000). *Mental health of children and adolescents in Great Britain*. London: The Stationery Office.
- Merry, S., Krolina, S., Parkin, A., Seymour,

- F., Lambie, I., Crengie, S., et al. (2004). Mental health research and development strategy: *Mental health research and development strategy. Child and youth outcome measures: examining current use and acceptability of measures in mental health services and recommending future directions*. Auckland: University of Auckland.
- Ministry of Education. (1 Feb 2010). Decile ratings. Retrieved 25 June, 2010, from <http://www.minedu.govt.nz/NZEducation/EducationPolicies/Schools/SchoolOperations/Resourcing/ResourcingHandbook/Chapter1/DecileRatings.aspx>
- Muris, P., Meester, S., & Van den Berg, F. (2003). The Strengths and Difficulties Questionnaire (SDQ): further evidence for its reliability and validity in a community sample of Dutch children and adolescents. *European Child and Adolescent Psychiatry, 12*, 1-8.
- Oakley Browne, M., Wells, J., & Scott, K. (2006). *Te rau hinengaro: The New Zealand mental health survey*. Wellington: Ministry of Health.
- Obel, C., Heirvang, E., Rodriguez, A., Heyerdahl, S., Smedje, H., Sourander, A., et al. (2004). The Strengths and Difficulties Questionnaire in the Nordic countries. *European Child and Adolescent Psychiatry, 13*, 32-39.
- Sagatun, A., Lien, L., Sogaard, A., Bjertness, E., & Heyerdahl, S. (2008). Ethnic Norwegian and ethnic minority adolescents in Oslo, Norway. A longitudinal study comparing changes in mental health. *Social Psychiatry and Psychiatric Epidemiology, 43*, 87-95.
- Van Roy, B., Groholt, B., Heyerdahl, S., & Clench-Aas, J. (2006). Self-reported strengths and difficulties in a large Norwegian population 10-19 years: age and gender specific results of the extended SDQ-questionnaire. *European Child and Adolescent Psychiatry, 15*, 189-198.
- Woerner, W., Becker, A., & Rothenberger, A. (2004). Normative data and scale properties of the German parent SDQ. *European Child and Adolescent Psychiatry, 13*.
- Zwirs, B., Burger, H., Schulpen, T., & Buitelaar, J. (2006). Different treatment thresholds in non-Western children with behavioral problems. *American Academy of Child and Adolescent Psychiatry, 45*, 476.

Corresponding Author:

Stella Black
Researcher, CRRC
Level 3, Snelgar Building
Private bag 93 115
Henderson
Waitakere 0650,
New Zealand.
stella.black@waitematadhb.govt.nz