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## The use of the Strengths and Difficulties Questionnaire (SDQ) in Southern European countries

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■ **Abstract** This paper reports a selection of completed or ongoing studies that have evaluated or applied the Strengths and Difficulties Questionnaire (SDQ) in five countries of Southern Europe: Italy, Spain, Portugal, Croatia, and France. In Italy, the SDQ has been used to study its concurrent validity with other norm-based instruments (Child Behavior Checklist – CBCL and Disruptive Behavior Disorder Rating Scale – DBDRS), to assess the efficacy of a behavioural school training, and as part of an epidemiological study. In Spain, the SDQ was used to analyse the association between respiratory and other behavioural problems. In Portugal and Croatia, psychometric properties of the three versions of

the SDQ (parent, teacher, and self-reports) were investigated in samples of children ranging from 5 to 16 years. Past and ongoing studies in France have administered the SDQ to estimate inter-rater agreement between parents, teachers, and pupils, to carry out a large-scale epidemiological study, and to evaluate the efficacy of a parent training programme.

In a second section, scale means obtained with the teacher version of the SDQ in three community-based samples of 7–8 year-old children from Italy, Portugal, and Spain are compared. The results show that, according to their teachers' ratings, Italian pupils showed less prosocial behaviour than their Spanish and Portuguese age-mates, whereas the Portuguese children were rated as being more hyperactive and inattentive than comparable Italian and Spanish children. Possible causes underlying the observed differences between national SDQ means are discussed.

■ **Key words** Strengths and Difficulties Questionnaire (SDQ) – behaviour problems – rating scales – cross-national comparisons – Southern Europe

## Introduction

The present contribution is subdivided into two main sections: The first part provides an overview and brief descriptions of several SDQ studies carried out in five countries of Southern Europe: Croatia, France, Italy, Portugal and Spain, while the second section reports and compares teacher-rated SDQ scores in three community-based samples of Italian, Spanish, and Portuguese children aged 7–8 years.

For obvious reasons, the presented selection is neither comprehensive nor exhaustive, thus apologies are due to any individual researchers or further projects that have used or evaluated the SDQ in this region of the world but are not mentioned here. Nevertheless, it is hoped that this summary will encourage more intense international exchanges and SDQ-related collaborations in the future.

## The SDQ in Southern Europe: selected studies

### ■ Italy

The Italian version of the SDQ has been administered in several studies: In the first one to be reported, coordinated by Mario Di Pietro and Gian Marco Marzocchi, the SDQ was used as a research tool to evaluate a behavioural modification programme for reducing problem behaviour of children at school. A second Italian study, coordinated by Alessandra Frigerio, is a large epidemiological research project in which the main aim was to assess the prevalence of mental disorders in preadolescent children.

In the study coordinated by Di Pietro and Marzocchi, the teacher version of the SDQ was completed along with the Disruptive Behaviour Rating Scale (DBD-RS) [18], in order to assess the efficacy of a teacher training programme [2, 14] and to test the concurrent validity of the SDQ with the DBD [16, 17]. Data collection involved 53 teachers of a total of 528 children aged between 7 and 11 years (286 males and 242 females) and attending primary school in Northeastern Italy. Main results showed that the three subscales of the DBD (i. e. Inattention, Hyperactivity, and Oppositional Defiant Disorder – ODD) were significantly correlated with the conduct problems and hyperactivity-inattention subscales of the SDQ. In particular, the highest correlations were found between the conduct problems (SDQ) and ODD (DBD) scales ( $r=0.81$ ) as well as between hyperactivity-inattention (SDQ) and inattention (DBD) scores ( $r=0.84$ ). It is interesting to note that the correlation of the SDQ hyperactivity-inattention score was lower with DBD-hyperactivity ( $r=0.73$ ) than with DBD-inattention. This result can be explained by the fact that the hyperactivity-inattention subscale of the SDQ comprises 2 inattention

items, 1 impulsivity item, and 2 hyperactivity items. In fact, according to a factor analysis of the Italian teacher SDQ, the two hyperactivity items loaded on the same factor as the conduct problems items, whereas the remaining 3 items of the SDQ hyperactivity-inattention subscale loaded on a different factor which reflected inattention and impulsivity rather than hyperactivity. Thus, a tendency to confound hyperactive behaviour with conduct problems was observed in this sample of Italian teachers, which may also have led to the stronger association of the SDQ hyperactivity-inattention score with DBD-inattention than with DBD-hyperactivity.

Normative data based on teacher ratings for this sample of 528 primary-school children were reported in an Italian publication [15]. Analysing possible gender and age effects on the SDQ scores, a significant difference between younger and older children was obtained only for the prosocial behaviour subscale, with older children displaying more prosocial skills (7–8 years: 5.94 vs. 9–11 years: 7.05;  $p < 0.001$ ). None of the other scores of the teacher-rated scales differed between the older and younger subgroups. On the other hand, four of the five SDQ subscales revealed significant differences between boys and girls. Boys scored higher than girls on the difficulties subscales assessing hyperactivity-inattention, conduct problems, and peer problems, but had lower scores on the subscale describing prosocial behaviour. No gender differences were observed with respect to the emotional symptoms subscale. The internal consistency (Cronbach's Alpha) of the teacher-rated SDQ scales ranged between 0.73 and 0.89.

A second Italian study, coordinated by Frigerio, is a multicentric project still in progress, carried out in six Italian cities in Northern and Central Italy and in Sardinia. The methodology employed in this research is based on a classical two-phase sampling design: [1] a screening phase concerning emotional and behavioural problems, in which parents of approximately 5000 subjects aged 10 to 14 years were asked to complete the Child Behavior Checklist (CBCL) [1]; was followed by [2] a clinical assessment phase in a smaller sample of approximately 1000 (pre)adolescents and their parents, composed of all subjects scoring above the clinical cut-offs on the CBCL internalising and/or externalising scales along with a 10% random sample of the remaining subjects. Instruments used in the second phase included the Italian versions of the SDQ, the Development and Well-Being Assessment (DAWBA) [7], the CGAS (Children's Global Assessment Scale) [20], and the Health of the Nation Outcome Scales for Children and Adolescents (HoNOSCA) [11].

This ongoing project is expected to provide a substantial contribution to the validation of the Italian parent and self-report versions of the SDQ. More specifically, the obtained findings will include an evaluation of the ability of the SDQ to detect child psychiatric disorder.

ders in preadolescents as assessed by the DAWBA, determination of the relative contributions of parent and self-reported SDQ ratings to the prediction of psychiatric diagnoses, and direct comparisons between predictive values of the parent SDQ and CBCL.

## ■ Spain

In the context of the Childhood Respiratory Health Study (SARI) coordinated by Enric Duran, the SDQ has been used in Spain as a tool for assessing the association between specific psychiatric and asthma-related symptoms. This large-scale study had several aims: (1) to investigate the variability in the prevalence of respiratory symptoms associated with asthma, (2) to estimate regional variations in the proportion of children underdiagnosed and undertreated for asthma, and (3) to explore the relationships between atopy and attention-deficit/hyperactivity disorder (ADHD) as well as between asthma and psychiatric symptoms.

Just as the Italian project mentioned above, the SARI study was carried out in two stages. Phase I represented a population-based cross-sectional design, and was carried out in the cities of Sabadell and Barcelona. Of the 12,382 questionnaires distributed to the families participating in this project, 10,821 (response rate of 87.4%) were completed by parents. Collected information included personal and demographic characteristics, respiratory symptoms related to asthma, risk factors for asthma (concerning both child and parent properties), and the quality of home environment. Phase II had a population-based case-control design. According to their respiratory symptoms reported in Phase I, all 2,616 positive cases (classified in six groups of symptoms) and a control sample of 1,292 randomly selected subjects without respiratory symptoms were invited to participate in the second phase. A total of 2,070 cases (response rate 79.1%) and 1,014 controls (response rate 78.6%) returned the completed SDQ forms as well as questionnaires on asthma medication and use of health services. In addition to the parent SDQ, teacher reports and self-ratings were also collected in Phase II. In summary, the following main outcomes are expected from the results of this study: (1) to describe the prevalence of psychiatric symptoms in children with asthma problems and in a control sample of children free of such symptoms, and (2) to assess the relationship between respiratory symptoms, biological and genetic factors, and psychiatric symptoms as measured by the SDQ.

## ■ Portugal

Psychological and psychiatric research as well as clinical work with children and adolescents all need to rely on

validated instruments to screen for emotional and behavioural problems. In Portugal, there is a particular need for such instruments. Some authors speak of a "psychological assessment crisis" [21] when referring to the lack of testing materials standardised or even adapted for the Portuguese population. The SDQ seemed to represent a promising tool to ameliorate this "crisis", providing important behavioural information from the most important habitats of childhood – home and school – and screening for externalising and internalising disorders in a very simple and brief way.

The aim of the first study carried out in Portugal, coordinated by Alexandra Simões, was to analyse the psychometric properties of the SDQ using the extended version in a Portuguese community sample of children. The investigated aspects included item analysis, internal consistency of the SDQ scales, and evaluation of construct validity. Although several studies have used this instrument in Brazil (see [22] in this supplement), this was the first research examining psychometric characteristics of the SDQ in Portuguese, one of the most-spoken languages around the world.

The study was carried out in four state schools (two elementary and two secondary) in Lisbon, randomly chosen from a larger pool in order to obtain a representative sample of 1082 children aged between 5 and 15 years. SDQ self-reports were handed to those children aged 11 and older ( $N = 587$ ) during a class in which they were asked to fill in their answers. Parent forms were taken home by the entire sample, and completed there by a total of 643 parents. In addition, 61 teachers rated their students using the corresponding SDQ teacher-report version.

At the level of individual item analysis, mean item scores (facility index) and item discrimination (item-total selectivity coefficients) were evaluated. Scale reliabilities and structural properties were investigated by calculating internal consistency coefficients, correlations across scales, and inter-rater agreement. When compared to the original reports from the UK [5], inter-rater analyses demonstrated similar or even higher agreement between all three informants. Construct validity was generally confirmed by factor analyses which showed that nearly all items had their highest loadings grouped according to the expected subscales. However, the original peer problems scale was not replicated in teacher ratings and self-reports. Nevertheless, since the overall pattern of loadings very strongly resembled those found in the UK and in other countries, it was concluded that the five SDQ subscales were an adequate model for structuring the Portuguese SDQ.

The SDQ has seen further use in Portugal in a number of other studies coordinated by Maria Filomena Gaspar. The main goal of this research was to validate the SDQ at pre-school age prior to using it in future prevention projects. In the first study, mothers with a pre-

school age child were contacted along with their children's pre-school teachers. Based on their reports, SDQ scores were obtained for 45 girls and 53 boys. Unexpectedly, no significant gender effects were detected. Even within this young age level, however, there were several significant differences between younger and older children. According to reports by their mothers and pre-school teachers, older children showed more prosocial behaviour. Teacher ratings for older children showed fewer conduct problems and less hyperactivity. Except on the peer problems subscale, mothers' ratings yielded higher scores on the difficulties subscales than those by pre-school teachers. Furthermore, parent ratings were found to be associated with demographic variables: mothers' age, fathers' education, and monthly household income all correlated negatively with the hyperactivity-inattention subscale, while mothers' educational level showed a negative correlation with the child's emotional symptoms score.

A second study by the same investigator [4] analysed how different aspects of family unpredictability might relate to emotional or behavioural problems and socio-emotional competence of pre-school age children. The parent SDQ and the Portuguese version of the Family Unpredictability Scale (FUS) [19] were administered to 66 married mothers of pre-school age children who had been contacted through their child's pre-school. The majority of the families in this study were from lower socio-economic backgrounds and lived in a rural area. It was expected that higher FUS scores would be associated with less healthy functioning among children. However, this prediction was not supported by the correlations obtained between SDQ scores and FUS scales (discipline; nurturance; meals; money). Thus, parental inconsistency within the predominantly normal range found in this sample did not show a marked effect on children's emotions or behaviour.

Two further studies with community pre-school age children are currently in progress. These aim to evaluate the impact of classroom social atmosphere and parenting practices on children's emotions and behaviour. Scores in the Classroom Atmosphere Measure (Fast Track: Conduct Problems Prevention Research Group CPPRG: ASKER program) and in the Parent Practices Interview (The Incredible Years Project, University of Washington, Parenting Clinic) will be correlated with the SDQ scores. Both studies have been developed in the context of a prevention model.

To summarise, SDQ studies carried out in Portugal gave further evidence of the reliability and validity of this instrument. The utility of the SDQ was confirmed, particularly for those who work in schools and need to assess children with brief but accurate methods, in order to facilitate and improve child-centred interventions.

## ■ Croatia

The purpose of an ongoing study in Croatia, coordinated by Helena Hamilton, is to assess the suitability of the SDQ as a method for screening Croatian children and young people for psychiatric problems. This validation study involves two groups of 6–16-year-olds; a community sample and a clinical sample (data being collected). The community-based sample of 77 females and 74 males was drawn from two randomly chosen schools in Karlovac. Parent and teacher SDQs were obtained on all 151 community subjects, while self-report SDQs were filled in by a subgroup of 106 older participants aged 11–16 years. After data collection from the clinical sample has been completed, Receiver Operating Characteristics (ROC) analyses will be used to determine whether the SDQ can distinguish between the two groups of children, thus establishing the validity of the questionnaire to screen for psychiatric disorders in Croatia.

## ■ France

As in other countries, rising rates of behaviour disorders in children and adolescents have been reported in France. However, only few epidemiological studies have systematically investigated this issue [3], partly because appropriate screening instruments were not available in the past.

In France, two research projects are being carried out with the SDQ. The first one, coordinated by Christiane Capron, comprises both a validation sample and a large-scale epidemiological study; the second project, coordinated by Gérard Pithon, has used the SDQ to assess the efficacy of a parent training programme.

The goal of the French project coordinated by Capron is threefold: (1) to validate the SDQ by comparing results from a clinical sample with a matched community-based sample and examining cross-informant agreement, (2) to carry out an epidemiological study in order to determine prevalence rates of behaviour disorders in the Hérault department in Southern France, and (3) to study several risk factors which could influence or predict child psychiatric disorders.

The ongoing validation study involves a clinic sample of child psychiatric patients aged 11 to 16 years. Based on DSM-IV and ICD-10 diagnoses, children and adolescents with conduct disorders, emotional disorders, and/or attention-deficit/hyperactivity disorders are selected only if they are free of pathology associated with a mental deficiency. The SDQ is completed by the patients themselves, one of their parents, and two of their teachers. To determine cut-off points for the French SDQ, scores obtained for these patients will be compared to a community-based sample matched for age, gender, and socio-economic status (SES) of the parents.



Currently, SDQ self-reports are available from 48 patients (mean age: 13.9 years), representing roughly one half of the intended final sample size of 100 patients. Teacher questionnaires have been completed for 32 patients included in this clinic sample. Preliminary observations can be reported by comparing SDQ scores of these patients with self-reports from a matched community sample of 86 children (mean age: 13.5 years), including 51 with teacher-rated SDQs.

On account of the non-Gaussian distributions of the total difficulties scores, median values rather than scale means were chosen to compare the two groups (clinic patients: median = 16; community sample: median = 11). Since two different teacher-reports were available for 13 of the patients, a bootstrap analysis was carried out to best estimate provisional medians for the teacher-rated total difficulties score (clinic patients: median = 14; community sample: median = 7). Even though these are only provisional findings, it seems obvious that parents are seeing more problems than teachers.

In line with previous studies [6, 8, 13], preliminary analyses of the French data used ROC curves and the AUC (area under the curve) measure to establish how well the questionnaire is able to distinguish between high- and low-risk samples [12]. The only underlying assumption of the ROC method is that patients in the clinical sample are, on average, more disordered than subjects recruited from the community. Since it was known that all clinical subjects had at least one psychiatric diagnosis, it was not necessary to assume that all community subjects were free of psychiatric disorders, nor did the clinic sample have to be representative of all preadolescent patients in psychiatric clinics.

ROC analyses were performed for the self-reported and teacher-rated SDQ scales. Based on the SDQ total difficulties scores, AUC measures were calculated to examine the discrimination between the two samples. In general, AUC values can range from 0.5 (= chance level) to 1.0 (= perfect discrimination). The obtained AUC values were 0.70 for SDQ self-reports and 0.82 for teacher ratings. Thus, preliminary results indicate that the total difficulties scores of the SDQ allowed the distinction of clinic and community samples, with teacher-reported scores demonstrating somewhat higher discriminative power than the self-ratings.

Provisional cut-off points for the French SDQ were also specified using ROC analyses, following a rationale which aims to minimise both false positives and false negatives. After data collection in this validation study is completed, the final cut-off values will be employed to estimate prevalence rates of behaviour disorders in the epidemiological sample.

The much larger epidemiological study examines preadolescents in full-time education at the second level of secondary school ("5<sup>th</sup> grade" in the French system). The age of 12 years was chosen because the few epi-

demiological studies that have focused on behavioural disorders at this particular age have yielded diverging results. The sex ratio for psychiatric disorders is known to change over the developmental stages, with boys predominating in the preadolescent period but a balanced or reversed distribution throughout adolescence; thus a more precise evaluation of adolescent girls was expected by also determining whether they were pubescent. Unless they have repeated one of the previous grades, children attending the investigated French "5<sup>th</sup> grade" are usually 12 years old, or younger if they are one school year ahead.

Selection of a total of 25 participating schools took into account the ratios of rural and urban regions as well as private and state secondary schools, ensuring that the sample is indeed representative for the Hérault department. At the end of data acquisition, a total sample size of 1500 is expected. Both SDQ self-reports and teacher ratings will then be used to estimate prevalence rates of behaviour disorders, and to inspect cross-informant agreement between teachers and pupils.

Finally, potential risk factors such as previous school failure, SES, gender, urban/rural environment, puberty, family structure, number of siblings, and birth order will also be available and examined in conjunction with the SDQ results obtained in this epidemiological study.

The second French investigation, coordinated by Pithon, is an international project involving a team of researchers in French-speaking countries (Pourtois and Barras in Belgium, Pithon and Prévôt in France, Perrez and Plancherel in Switzerland, as well as Terrisse, Larose, and Bédard in Quebec, Canada), and uses the SDQ to evaluate the effects of a parent training programme designed by Gordon [9] and translated into French by Pithon and Terrisse [10]. Behavioural ratings are collected from adolescents themselves, their parents, and a teacher who knows the subject well. Parents' knowledge, educational attitudes, and competencies are assessed before and after the training programme. Two types of families are participating: parents being supervised by social workers because of their difficulties to handle their children, and parents without relevant educational problems.

#### ■ Comparison of teacher ratings for Italian, Spanish, and Portuguese 7–8 year-olds

Given that at least some of the SDQ scale scores are obviously subject to considerable age and sex effects, any comparison between normative data from different countries or studies only makes sense if one looks at similar age ranges and controls for gender. Among the different countries included in this overview, sufficiently-sized community subsamples of comparable age were only available for teacher-rated SDQs of 7-to-8-

year-old children from Italy, Portugal, and Spain (total  $N = 1284$ ). Subdivided by gender, Table 1 presents scale means and standard deviations of teacher-reported SDQ scores for these young community-based samples.

An initial comparison of these three subsamples uncovered that the sex ratios were not equal in the three national groups. Post-hoc analyses revealed that the Italian sample included more boys than expected, while the Portuguese sample comprised a larger proportion of girls. For this reason, all comparisons of the obtained SDQ scores were subdivided by gender. Consistent gender differences were found in all three countries: As expected, boys were rated as being significantly more hyperactive, having more conduct problems, and showing less prosocial behaviour than girls (all  $p < 0.01$ ).

Differences between countries were investigated using oneway analyses of variance (ANOVAs) with three independent groups, run separately for each gender and each of the SDQ scales, with the required alpha level being set at  $p < 0.005$  after applying the Bonferroni correction for multiple comparisons.

The ANOVAs performed for teacher ratings of boys revealed that the three groups scored significantly different on the two subscales assessing hyperactivity-inattention ( $p < 0.005$ ) and prosocial behaviour ( $p < 0.001$ ). Post-hoc pairwise comparisons showed that Portuguese boys were rated as being significantly more hyperactive/inattentive than the other two groups. Italian boys received significantly lower prosocial behaviour scores than those in the other two countries.

For girls, significant differences between the three national groups emerged on the same two subscales measuring hyperactivity-inattention and prosocial behaviour (both  $p < 0.001$ ). Again, Tukey post-hoc tests showed higher hyperactivity scores for Portuguese girls and less prosocial behaviour in Italian girls, in contrast to the respective other two groups.

Thus, irrespective of the unequal gender distributions in these three national samples, teacher-rated SDQ

scales assessing hyperactivity-inattention and prosocial behaviour of male and female 7–8 year-olds were shown to yield the same major differences between the three South European countries.

However, from these findings it is not possible to conclude that Portuguese children are indeed more hyperactive and inattentive than the Italian or the Spanish ones, nor that Italian children are in fact less prosocial than their Portuguese and Spanish age-mates, because the observed effects could also be a result of different levels of expectation adopted by the teachers in the compared countries. Specifically, Portuguese teachers might tolerate less hyperactivity, while Italian teachers may demand more prosocial behaviour from their pupils. Such culture-related levels of tolerance and expectations could well have been reflected in the reported teacher ratings, and would also have yielded the observed pattern of national differences.

In conclusion, the take-home message of this comparison is that there are some differences between Italy, Spain, and Portugal concerning teacher-reported hyperactivity-inattention and prosocial behaviour in younger children. It would be interesting to compare these ratings with other countries, in order to achieve a better understanding of the cultural factors responsible for diverging levels of hyperactivity or other problem behaviour reported, for example, in North America vs. Europe, or in Northern vs. Southern European countries. Moreover, international and cross-cultural studies including both SDQ and naturalistic observations at school seem necessary in order to disentangle the possible factors (i. e. children's behaviour per se or culture-specific levels of the adult informants' expectations and tolerance) underlying observed differences in questionnaire ratings.

**Table 1** Community-based teacher-rated SDQ results for South European boys and girls aged 7–8 years

	Italy		Portugal		Spain	
	Boys N = 164 Mean (SD)	Girls N = 130 Mean (SD)	Boys N = 86 Mean (SD)	Girls N = 95 Mean (SD)	Boys N = 377 Mean (SD)	Girls N = 432 Mean (SD)
Age (years)	7.8 (0.4)	7.7 (0.4)	7.5 (0.5)	7.5 (0.5)	7.6 (0.5)	7.7 (0.4)
Total difficulties score	10.9 (8.0)	7.6 (6.0)	12.1 (7.8)	8.8 (6.1)	9.6 (7.0)	6.8 (5.6)
Emotional symptoms	2.4 (2.6)	2.1 (2.3)	2.5 (2.5)	2.3 (2.2)	1.8 (2.0)	1.8 (1.9)
Conduct problems	2.4 (2.5)	1.5 (1.8)	2.3 (2.5)	1.3 (1.9)	1.8 (2.0)	1.0 (1.5)
Hyperactivity/inattention	4.1 (3.3)	2.4 (2.4)	<b>5.2*</b> (2.9)	<b>3.8*</b> (2.6)	4.0 (3.0)	2.5 (2.4)
Peer problems	2.0 (2.1)	1.5 (1.7)	2.0 (1.9)	1.4 (1.6)	1.9 (1.8)	1.6 (1.9)
Prosocial behaviour	<b>5.6*</b> (2.8)	<b>6.9*</b> (2.6)	7.1 (2.7)	7.9 (2.4)	7.4 (2.2)	8.5 (1.7)

\* significant differences ( $p < 0.005$ ) compared to the respective other countries

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