SOCIAL, EMOTIONAL AND BEHAVIOUR DIFFICULTIES IN MALTESE SCHOOLS: A MULTILEVEL MODEL

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Abstract:

Social, emotional and behaviour difficulties (SEBD) in schools are a complex phenomenon resulting from factors, including biological, psychological and social factors. The main objective of this paper is to identify a number of student, class and school-related factors that are significantly related to SEBD and develop new ways of understanding and preventing SEBD in Maltese schools. A proper methodology for analyzing hierarchical structured data where observations are nested within groups is multilevel modelling. This paper presents a three-level random intercept model that accommodates random effect within each level of nesting and examines the contribution of a number of predictors in explaining variations in the SEBD scores elicited from 5300 students attending primary and secondary state, church and independent schools. The model identifies student related variables, particularly engagement, diagnosis and intervention, as better predictors of SEBD better than class and school related variables.

Keywords: SEBD, random intercept model, multilevel model, Malta, schools

JEL Classification:

Introduction

Social, emotional and behaviour difficulties in schools, such as defiant and oppositional behaviour, violence, anti social behaviour and bullying, have become an increasing cause for concern in many countries. Currently, taking the widest definition of SEBD it is estimated that about ten percent of school children experience significant problems of SEBD at any time (BMI, 2006, Cefai, Cooper and Camilleri, 2008). The increasing concern about behaviour problems in schools amongst school staff is often accompanied by an intense debate about the nature and causes of such difficulties and the most effective ways for responding to the situation. The debate is frequently characterised by divergent views, entrenched positions and blaming approaches. One position highlights the issue of lack of respect towards adults, of children having too many rights and of changing values leading to a more permissive society. This very often cross fires with the other position asserting the right of children and young people to have a say in decisions affecting their lives, and the need for schools to become more emancipatory, democratic and empowering social organisations. The traditional debates of nature versus nurture and who is to blame for children's difficulties, of inclusion versus segregation and exclusion, of discipline and authority versus positive behaviour management, raise their heads again. In many instances however, such positions are not only simplistic but offer little effective remedies in the long term as they ignore the complexity of the difficulties. An adequate understanding and intervention for SEBD needs to take the various biological, psychological and social influences and the various systems in the life of the child (Cooper, 2004, 2005).)

The objective of this paper is to explore the relationship between the nature and distribution of SEBD and individual and socio-cultural factors as reflected in the school context and family/community factors. More specifically the study makes use of multilevel modeling for analyzing hierarchical structured data nested within different levels, presenting a three-level random intercept model that accommodates random effect within each level of nesting and examining the contribution of a number of predictors in explaining variations in SEBD.

Sampling and methodology

This sample, which amounted to around 7% of the whole school population, was stratified mainly by gender, school level, school type, and school region. The student population was first divided into a number of non-overlapping subgroups, and then random samples of school children were selected from each group. To ensure a representative sample of students, the strata were sampled in proportion to their size in the student population. In this multistage sampling procedure, the primary and secondary schools were selected from the Maltese Islands, providing a proportional representation of the school population. Cluster sampling was used to choose classes within the selected schools and random sampling was then used to choose students within the selected classes.

To measure of the students' level of social, emotional and behaviour difficulties (SEBD score), school teachers were asked to complete the Strengths and Difficulties Questionnaire (Goodman 1997) for each student. This questionnaire comprises four difficulty subscales, each consisting of five items, measuring emotional, hyperactivity, conduct and peer difficulties respectively. Emotional difficulties relate to anxiety and depression; hyperactivity to restlessness, over-activity and inattention; conduct to behaviour problems such as fighting, cheating and lying; and peer problems to bullying, loneliness, and having problems in relating with peers. The score for each subscale ranges from 0 to 10, while the SEBD score, which ranges from 0 to 40, is generated by summing the scores of the four subscales.

Essential information related to student, class and school factors was collected using a set of supplementary questionnaires that were completed by teachers, parents and head of schools. The student variables include engagement, diagnosis and intervention, socio-economic status, family structure, family size and gender. Student engagement was measured by summing the rating scores of 3 ordinal categorical variables (attainment, communication and attendance) measured on a 2-point or a 3-point scale. Child diagnosis and intervention was measured by summing the rating scores of 5 ordinal categorical variables (child diagnosis, condition illness, medication, assessment and intervention) measured on a 2-point scale. Socio economic status was measured by summing the rating scores of 5 ordinal categorical variables (father occupation, mother and father education, family income and residence ownership) measured on a 3-point or a 4-point scale. The list of SES indicators excludes mother occupation since 65% of all mothers were house carers. All the three student-related covariates were rescaled such that the scores ranged from 0 to 10. A high engagement score indicates students with good attainment, good communication and regular attendance. A high diagnosis and intervention score identifies students who suffer from mental or physical impairment or who receive forms of psychological and educational interventions or who require medication for physical chronics. A high SES score points out students whose parents have tertiary education, have professional jobs, receive a high income and own a house. Family structure (1-parent, 2-parent family), family size (1 child, 2-3, at least 4 children) and gender (male, female) were the other three student-related variables. The class variables include stream level (top, middle, low) and teacher qualification (B.Education/PGCE, college certificate, diploma, pedagogical course). Teachers who possess a degree or college certificate are more qualified than teachers who followed a pedagogical course or who own a diploma. The school variables include school environment, school level (primary, secondary) and school type (state, church, and independent). School environment was measured by summing the rating scores of 3 ordinal categorical variables (school space, play space, school environment) measured on a 3-point scale and then rescaled to range from 0 to 10.

A Multilevel Model

Generalized linear mixed models are linear regression models that accommodate predictors which involve a mix of fixed and random effects. These models are appropriate to analyse SEBD; however, they rely on the assumption that the responses (SEBD scores) are independent. This assumption is often unrealistic due to unobserved heterogeneity in the SEBD data which is frequently of multilevel nature. Multilevel models are hierarchical linear mixed models that facilitate the analysis of hierarchical data particularly when observations are nested within higher levels of classification. They accommodate well the levels of our clustered data set in which students are nested within classes and classes within schools. This paper presents a three-level random intercept model that accommodates random effect within each level of nesting, and examines the contribution of a number of predictors in explaining variations in the SEBD scores. In this application, the SEBD score provided by the teachers is the dependent variable, which is related to student-related predictors (Engagement, Diagnosis and Intervention, Gender, Socio-economic status, Family structure, Family size), to class-related predictors (Stream

level, Teacher qualification) and school-related predictors (School type, School level and School environment). The contribution of a predictor in the model fit is assessed by recording the change in deviance when comparing the log-likelihoods of the one-predictor model and the minimal model that includes no predictors. Predictors that reduce the log-likelihood by a large amount contribute significantly in improving the model fit. Since the change in deviance has a chi square distribution, then a p-value can be computed given the degrees of freedom. The contribution of a predictor in explaining variations in the SEBD scores increases with a decrease in the p-value. The STATA GLLAMM routine was used since it accommodates a large class of multilevel models.

Moreover, using the variances at each level of nesting, the intra-cluster correlations between class clusters and school clusters can be computed for each predictor. In the context of a three-level hierarchical model with random intercepts the intraclass correlation coefficient is a measure that gauges the similarity of observed responses within a given cluster. The school-level intraclass correlation is defined as the proportion of the total random variation in the observed responses due to the variance of the random school effect. If the SEBD scores of students in the same school are relatively homogenous, but tend to vary considerably across schools, then the school-level intraclass correlation is high. Similarly the classroom-level intraclass correlation is defined as the proportion of the total random variation in the observed responses due to random between classroom variations. This intraclass correlation is high if there is little variation in the SEBD scores of students within the same classroom compared to the variation between classrooms.

It is well known that a lone predictor could be rendered a very important contributor in explaining variations in the responses, but would be rendered unimportant in the presence of other predictors. In other words, the suitability of a predictor in a model fit often depends on which other predictors are included with it. The resulting three-level random intercept model examines the collective effect of these ten predictors on the student SEBD score. The predictors are included as fixed main effects, and random effects are associated solely with the intercept at each level of clustering.

Results

The first task was to assess the contribution of each predictor in explaining variations in the SEBD scores at each level of nesting. This was carried out by fitting several one-predictor random intercepts models for primary and secondary school children. Using a 0.05 level of significance, all sole predictors contribute significantly in explaining variations in the SEBD scores (Table 1). Student engagement is the best predictor of SEBD score since this explanatory variable effected the largest change in deviance. This is followed by diagnosis and intervention, stream level, family structure, SES, family size, gender, teacher qualification, school type, school environment and school level. An interesting remark is that student variables tend to explain variations in the SEBD scores better than class and school related variables. The contribution of stream level, however, should not be ignored.

Table 1: Log-likelihood, change in deviance and p-values

Predictor	Log-likelihood	Change in deviance	Degrees of freedom	P-value
None (Unconditional model)	17011.246	/		
Gender	16964.646	93.200	1	0.000
Engagement	16131.724	1759.044	1	0.000
Diagnosis and Intervention	16424.404	1173.684	1	0.000
Socio Economic Status	16713.775	594.942	1	0.000
Family Structure	16709.740	603.012	1	0.000
Family Size	16782.643	457.206	2	0.000
Stream Level	16655.749	710.994	2	0.000
Teacher Qualification	16995.307	31.878	3	0.000
School Type	17002.404	17.684	2	0.000
School Level	17009.227	4.038	1	0.044
School Environment	17004.353	13.786	1	0.000

The student level-1 variance clearly dominates this model; however some predictors account for a substantial part of the level-2 and level-3 variance (Table 2). This implies that the inclusion of some fixed effects, particularly engagement, diagnosis and intervention, stream level, family structure, family size and SES, explain a substantial portion of the total variability in the SEBD scores. An interesting observation is that stream level explains a large portion of the random variation in the SEBD scores at classroom and school levels, but hardly explains any of the random variation at student level.

Table 2: Variances between students, class and school clusters

Predictor	Student level-1 variance	Classroom level-2 variance	School level-3 variance
None (Unconditional model)	29.093	8.051	3.724
Gender	28.560	8.020	3.448
Engagement	21.307	5.403	1.280
Diagnosis and Intervention	23.386	6.347	2.846
Socio Economic Status	26.384	6.733	2.400
Family Structure	26.158	6.780	3.438
Family Size	27.154	6.472	3.519
Stream Level	28.663	2.454	1.255
Teacher Qualification	29.054	7.831	3.360
School Type	29.099	8.030	2.981
School Level	29.094	8.045	3.554
School Environment	29.094	8.029	3.181

The intra cluster correlations at school level range from 0.039 to 0.095 while the intra cluster correlations at class level range from 0.076 to 0.200. SEBD scores of students in the same school are modestly correlated, while observations on students within the same classroom have a somewhat higher correlation. The intra cluster correlations at student level range from 0.712 to 0.885. The fact that a large proportion of the intra cluster correlations are sizeable both at the class and school levels justifies the use of multilevel models.

Table 3: Intra cluster correlations at student, class and school levels

Predictor	Intra cluster correlation at student level	Intra cluster correlation at classroom level	Intra cluster correlation at school level
None (Unconditional model)	0.712	0.197	0.091
Gender	0.714	0.200	0.086
Engagement	0.761	0.193	0.046
Diagnosis and Intervention	0.718	0.195	0.087
Socio Economic Status	0.743	0.190	0.068
Family Structure	0.719	0.186	0.095
Family Size	0.731	0.174	0.095
Stream Level	0.885	0.076	0.039
Teacher Qualification	0.722	0.195	0.083
School Type	0.725	0.200	0.074
School Environment	0.715	0.198	0.087

The second task was to estimate the collective effect of the explanatory variables upon the dependent variable that they influence. For reliable estimation of the parameters, adaptive quadrature was used instead of ordinary quadrature, as the performance of the former is much better, particularly for large cluster sizes and large intraclass correlations. Moreover, adaptive quadrature is likely to give good estimates for normally distributed responses given that a sufficient number of quadrature points are used (Rabe-Hesketh, Skrondal and Pickles 2005). Adaptive quadrature required three iterations to converge.

The iterative procedure required three more iterations running Newton Raphson to update the parameters while retaining quadrature locations and weights fixed until convergence criteria were met.

Table 4: Variances and intra cluster correlations at student, classroom and school levels

Level	Variance	Intra cluster correlation
Student level -1	16.380	0.863
Classroom level-2	2.146	0.113
School level-3	0.456	0.024

The inclusion of the fixed effects of the student-, classroom- and school-level predictors reduced the estimated residual variance of the 'unconditional' model by roughly 54%. The estimates of the classroom- and school-level components were also substantially reduced by the addition of these fixed effects. The estimated school-level variance was reduced by about 88% and the estimated classroom level variance was reduced by approximately 73%. This suggests that the eleven predictors are effectively explaining a considerable amount of the random variation in the SEBD scores, particularly at the school and classroom levels. The magnitude of the variance component at the student level suggests that there is still unexplained random variation in the SEBD scores at this level. The student level-1 variance explains more than 86% of the total variability; while the classroom level-2 variance is almost five times the school level-3 variance (Table 4).

Table 5: Parameter estimates, standard errors and 95% confidence intervals

Predictor	Estimate	Standard Error	z	P > |z|	95% Confidence Interval	
Constant	22.844	0.693	32.96	0.000	21.486	24.203
Gender (male)	0.925	0.148	6.25	0.000	0.635	1.215
Gender (female)	Aliased					
Engagement	-0.891	0.029	-30.63	0.000	-0.948	-0.834
Diagnosis and Intervention	1.031	0.042	24.29	0.000	0.948	1.114
Socio Economic Status	-0.504	0.037	-13.67	0.000	-0.576	-0.432
Family Structure (2 parents)	-2.404	0.194	-12.42	0.000	-2.784	-2.025
Family Structure (1 parent)	Aliased					
Family Size (1 child)	0.889	0.194	4.58	0.000	0.508	1.270
Family Size (2-3 children)	-0.734	0.164	-4.46	0.000	-1.056	-0.411
Family Size (At least 4 children)	Aliased					
Stream Level (top)	-3.839	0.203	-18.93	0.000	-4.237	-3.442
Stream Level (middle)	-1.984	0.193	-10.27	0.000	-2.363	-1.606
Stream Level (low)	Aliased					
Teacher Qualification (B.Ed/PGCE)	-0.460	0.224	-2.05	0.040	-0.900	-0.021
Teacher Qualification (College Cert)	-0.308	0.274	-1.13	0.260	-0.845	0.229
Teacher Qualification (Diploma)	0.188	0.377	0.50	0.619	-0.551	0.926
Teacher Qualification (Ped. course)	Aliased					
School Type (State)	0.532	0.333	1.60	0.110	-0.121	1.186
School Type (Church)	0.143	0.361	0.40	0.692	-0.564	0.850
School Type (Independent)	Aliased					
School Level (Primary)	-0.371	0.204	-1.82	0.069	-0.770	0.028
School Level (Secondary)	Aliased					
School Environment	-0.043	0.042	-1.02	0.310	-0.125	0.040

Table 5 shows that the parameter estimates indicate that the expected SEBD score for a male is 0.925 higher than a female student. For every unit increase in the engagement and SES scores, the SEBD score is expected to decrease by 0.891 and 0.504 respectively. Conversely, for every unit increase in the diagnosis and intervention score, the SEBD score is expected to increase by 1.031. A child in a two-parent family structure is

expected to have an SEBD score 2.4 less than a child living with one parent. Single child families are more likely to have children exhibiting SEBD, while children in medium sized families (2-3 children) have least difficulties. The expected SEBD score for a child in a medium sized family is roughly 1.6 less than families with one child. The expected SEBD score for a child in a top stream level is about 3.8 less than one in a low stream level, indicating that severe SEBD cases are more likely to be students in the low stream level. Teacher qualification, school type, school level and school environment contribute less than other predictors in explaining the variation in SEBD scores. However, these parameters indicate that severe SEBD cases are more likely to be found in secondary, rather than primary schools and in state schools rather church or independent schools. Moreover, SEBD scores tend to decrease with better school environment and more qualified teachers.

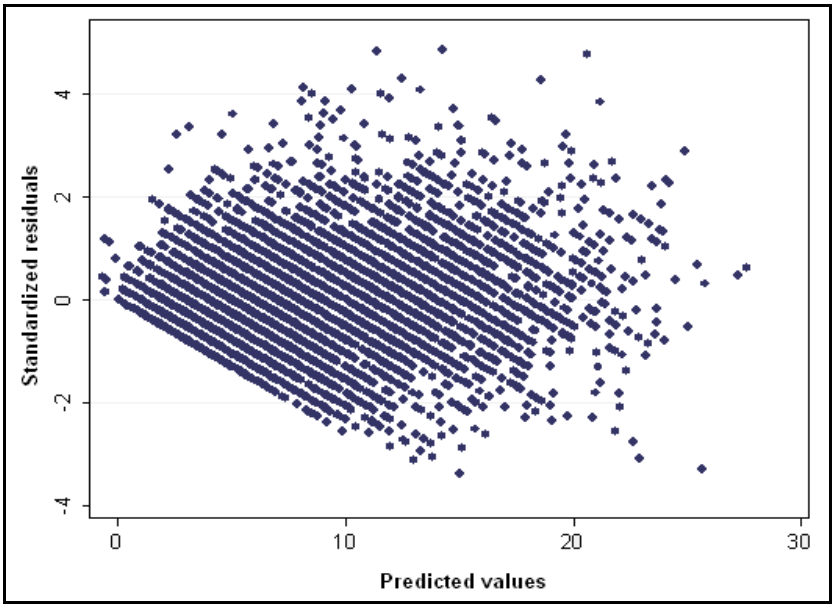

Figure 1: Standardized residuals against Predicted values

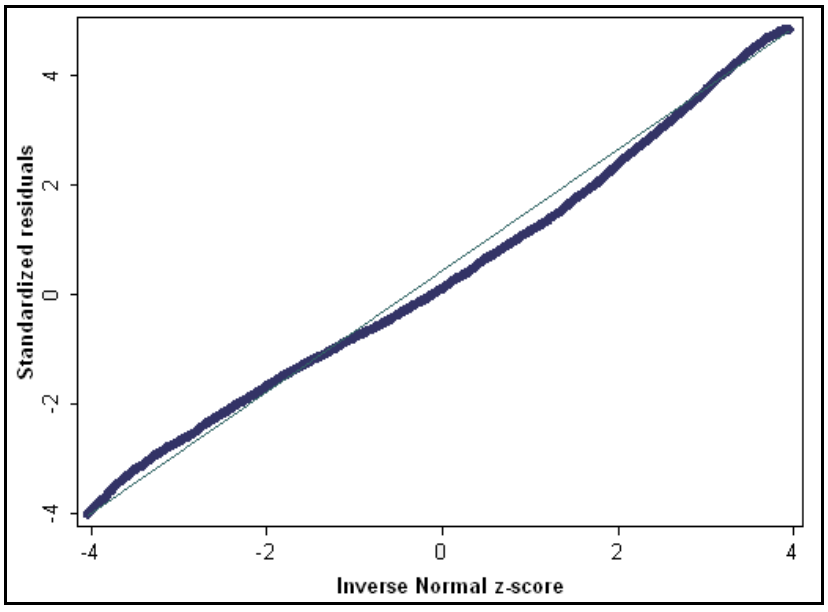

Figure 2: Normal probability plot

Residual plots are essential to check model specifications and provide information about linearity and heteroscedasticity. The linearity assumption is examined by plotting the standardized residuals against the predicted values of the SEBD scores. The predicted values include both the fixed and random effects part where posterior means are substituted for the random effects. The scatter plot (Figure 1) does not display violation of

this assumption since the residuals are randomly scattered around the zero line and there are no detectable patterns of the residuals. The normality assumption is examined by producing a normal probability plot in which the standardized residuals are plotted against their corresponding inverse normal z-scores. The points lie close to the straight line indicating no departures from the normality assumption (Figure 2).

The posterior means (empirical Bayes predictions) and standard deviations of the random effects are used to compute the confidence intervals of the average posterior means for each school and class in both primary and secondary schools. Some error bars do not overlap indicating that a number of classes and a number of schools have significantly different residuals. This is caused partly by streaming within schools and streaming between schools when students sit for the 11 plus examination (see Figures 3 and 4).

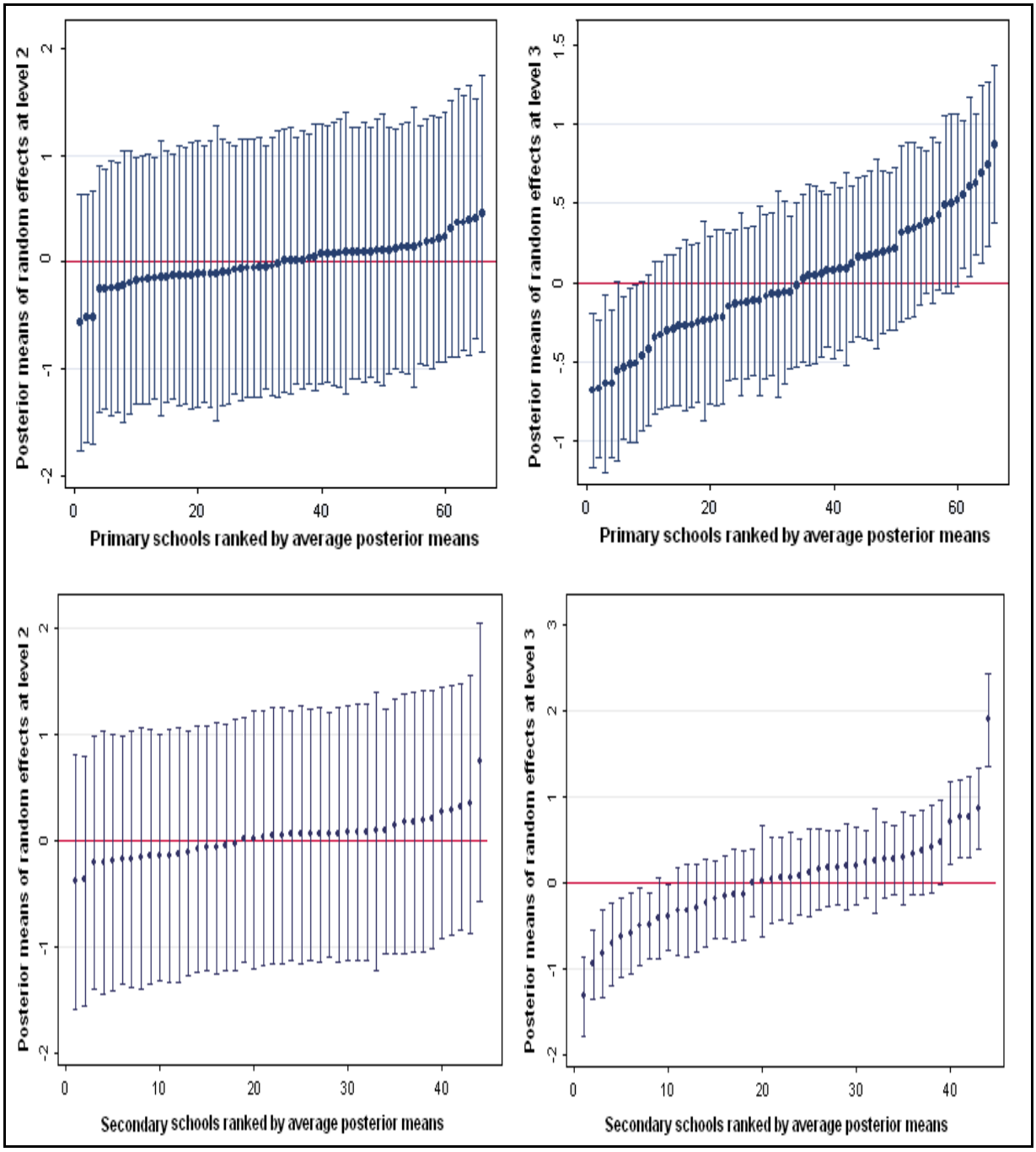

Figure 3: Posterior means of random school effects at level 2

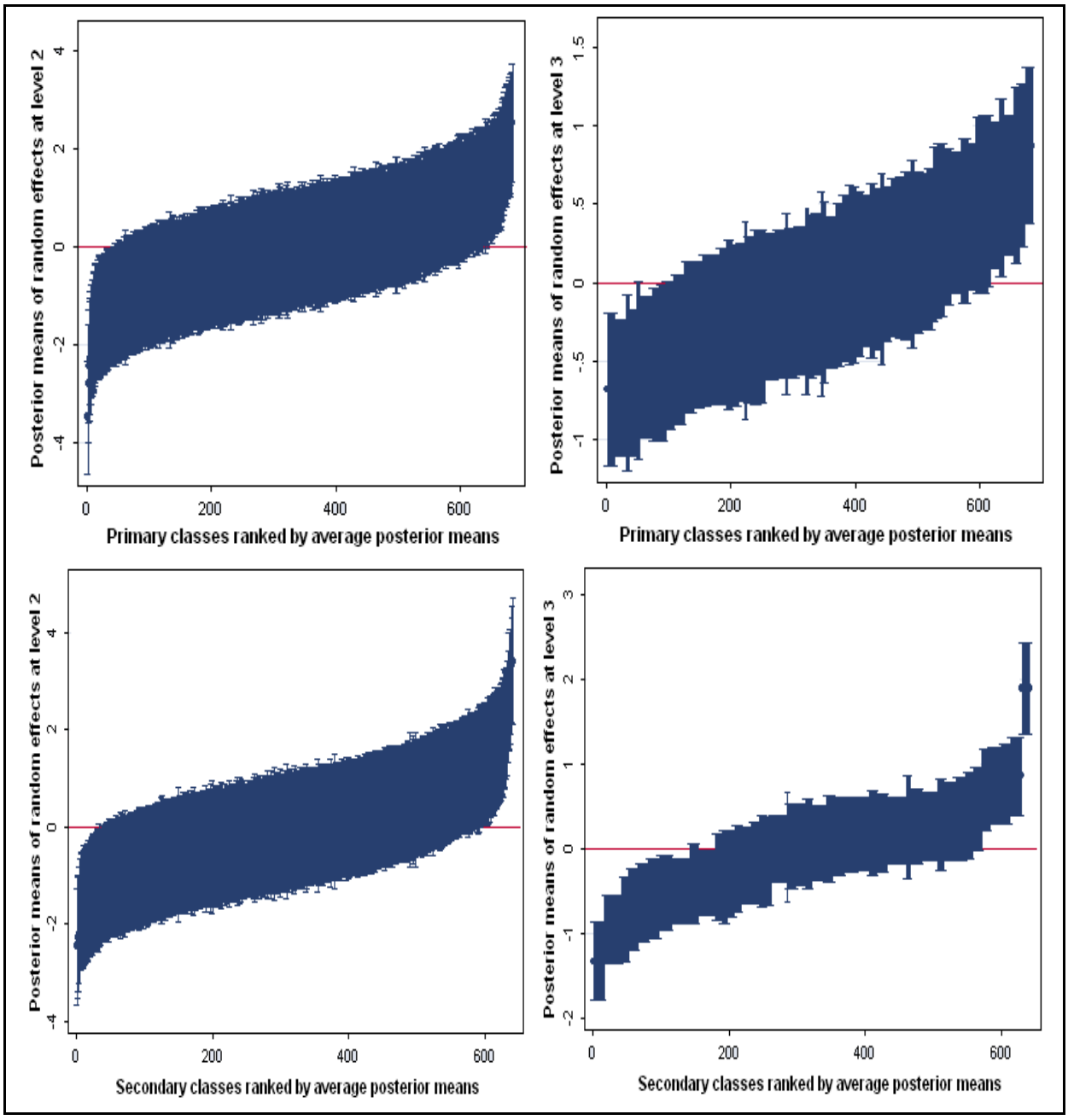

Figure 4: Posterior means of random class effects at level 2

Discussion

Student engagement, which includes such variables as attainment, attendance and communication, is the best predictor of SEBD, followed by diagnosis and intervention and stream level, thus underlining the inextricable link between learning and learning difficulties and behaviour. The relationship between attainment and SEBD is likely to be reciprocal, but high academic pressure, examinations, selection, and the lack of access to a differentiated and meaningful curriculum, are some of the possible factors which might turn a learning problem into a behavioural one (Cefai, Cooper and Camilleri 2008). Streaming explains a significant portion of the variance at classroom and school levels, which may suggest that lower streamed classrooms and schools practicing streaming may be increasing disaffection. Most children with SEBD in primary school are found in the smaller, lower streamed classrooms, suggesting that selection by ability and streaming practices have the effect of combining and heightening learning and behavioural difficulties, a finding first demonstrated by Hargreaves (1967). The quality of teaching, curriculum and learning support, might explain, at least in part, why students with learning difficulties appear to develop associated behaviour problems. It is well documented that teachers often

lower their academic and behavioural expectations for students in lower stream classrooms (Hargreaves et al. 1975; MacLure et al. 2008). Staff may also become reluctant to invest their effort and resources in such classes in a culture where they are measured according to the performance and achievement rates of students in examinations. Putting high risk students together may actually reinforce challenging and anti-social behaviour, while successful interventions involve students with SEBD in relationships with prosocial peers and staff (Poulin *et al*. 2001). It is also likely that the most challenging and vulnerable students are exposed, more than other students, to Teaching Assistants (in Malta these are known as learning support assistants). These tend to be trained at a lower level than teachers, and this has been found in two recent studies to be having a negative effect on the behaviour and educational performance of vulnerable students (MacBeath et al. 2006; Blatchford et al. 2009).

Family related factors, namely family structure and size and socio-economic status also came out as strong predictors for SEBD signifying the multifactedness of the phenomenon. These two sets of factors, namely school related and family related, explain a substantial portion of the variance while school factors such as school type and environment appear to have relatively lower influence on SEBD. This picture is reflected in the parameter estimates which suggest that the students most likely to have significant levels of SEBD are males, with low engagement scores, from low SES, with diagnosis for health and learning problems and receiving intervention, from one parent families and low streamed classrooms. Put together these risk factors may be grouped into gender (males) and diagnosis and intervention (individual-related variables), lack of engagement and low stream level (school-related levels), and low SES and one parent families (home related variables). Such a portrait underlines the influence of the various systems in children's and young people's lives and theses interact in determining students' behaviour and development. Schools have a key role to play in the prevention of SEBD from the very early years of primary education, with streaming, selection and learning difficulties being clear targets for immediate attention. They can make a difference in the lives of children and young persons as school effectiveness research and resilience literature have consistently shown (Teddlie and Reynolds 2000; Bernard 2004; Waxman, Padron and Chang 2004;), but they do not operate in a vacuum and cannot, alone, compensate for the effects of wider social and economic inequalities. They can help to direct children's social, emotional and cognitive development towards more positive trajectories, but their success will only be maximized when the relationships between SEBD and wider social policy issues are acknowledged and acted upon.

Another evident finding is that most of the variance is explained at the individual level in contrast to the classroom and school levels. The considerable intra class correlations at the classroom and school levels however, indicate that while the individual level accounts for the largest variation in SEBD scores, classrooms and schools still exert a considerable influence on students' behaviour and contribute significantly to students SEBD. This finding supports the multilevel modeling of SEBD in schools and underlines the added value over generalized linear models which assume one level of nesting.

The inclusion of the fixed effects of the predictors at the three respective levels reduced the estimated variance within the three levels considerably, suggesting that the 11 predictors are some of the major factors related to SEBD in Maltese school. While most of variance at the school and classroom levels is explained by these factors, the relatively lower variance at the individual level however, suggests that the model may be improved by the addition of other factors at the individual level. The initial phase of the study on which this paper is based, had ruled out such factors as nationality, ethnicity, language, religion and region which were not found to be significantly related to SEBD. On the other hand, the study did not look into such factors as school climate, classroom relationships, instructional practices, and classroom management amongst others which have been found to exert considerable effect on students learning and behaviour (eg Daniels et al. 1999). It is also interesting to note the relatively higher level of influence of the classroom level when compared with that of the school level, reflecting school effectiveness research which shows that classrooms are more important than schools in determining students' academic and social behaviour (Kyriakides, Campbell and Gagatsis 2000; Muijs and Reynolds 2005). Factors such as school level, school type and school environment become insignificant when considered collectively with the other individual and classroom level predictors, underlying the potentially stronger influence of the individual and classroom level processes.

Conclusion

In our review we analyzed a data set related to SEBD using a multilevel random intercept model, which overcomes the limitations of normal regression models by accommodating random effect within each level of nesting. One of the issues that are not addressed by the model is that class and school differences in SEBD scores may be more pronounced at lower than at higher engagement scores; whereas class and school differences may be more conspicuous at higher than at lower diagnosis and intervention scores. Another limitation is that some of the variables particularly, engagement, SES and diagnosis and intervention, cannot be measured perfectly and so it may be more appropriate to consider these hypothetical constructs as latent variables or hidden traits underlying the measured items. We suggest two recommendations for future research. The first approach is to fit a multilevel random coefficient model in which the random effects associated with the levels of the random factors enter the model as random coefficients rather than random intercept. The second approach is to fit a multilevel structural equation model in which some of the explanatory variables are assumed to be latent rather than fixed. Multilevel structural equation modeling accommodates a hierarchy of nested clusters when some of the variables of interest are latent since they are measured by multiple indicators.

References

1. Benard, B. (2004) *Resiliency: What We Have Learned*. CA: WestEd

2. Blatchford, P., Bassett, P., Brown, P., Koutsoubou, M., Martin, P., Russell, A. & Webster, R with Rubie-Davies, C. (2009) *The Impact of Support Staff in Schools. Results from the Deployment and Impact of Support Staff (DISS) project. Strand 2 Wave 2.* Research Report 148, London: DCSF

3. British Medical Association (2006) *Child and adolescent mental health – a guide for healthcare professionals.* London: BMA.

4. Cefai, C, Cooper, P and Camilleri, L (2008) *Engagement Time. A National study of social, emotional and behaviour difficulties in Maltese schools*. Malta: European Centre for Educational Resilience, University of Malta

5. Cooper, P. (2004) Nature and Nurture: Understanding the Interaction Between Biological, Social and Psychological Factors in Emotional and Behavioural Difficulties. In E. Hawarth (Ed.) *Supporting staff working with pupils with SEBD. A Handbook*. Lichfield: Qed

6. Cooper, P. (2005) Biology and Behaviour: The educational relevance of a biopsychosocial perspective, in: P. Clough, P. Garner, J.T. Pardeck and F Yuen (Eds.) *Handbook of Emotional and Behavioural Difficulties*, London: Sage.

7. Daniels, H., Cole, T. and Reykebill, N. (1999) *Emotional and Behaviour Difficulties in Mainstream Schools*. London: DfEE.

8. Goldstein, H. (2003), *Multilevel Statistical Models* (third edition). London: Arnold.

9. Goodman, R. (1997) The Strengths and Difficulties Questionnaire: A Research Note. *Journal of Child Psychology and Psychiatry*, 38, 581-586.

10. Hargreaves, D (1967) *Social Relations in a Secondary School,* London: Routledge

11. Hargreaves D, Hestar S and Mellor F (1975) *Deviance in Classroom* London; Routledge and Kegan Paul Kyriakides, L., Campbell, J., and Gagatsis, A. (2000). The significance of the classroom effect in primary schools: An application of Creemer´s comprehensive model of educational effectiveness. *School effectiveness and School Improvement*, 11(4), 501-529

12. Longford, N. T. (1993), *Random Coefficient Models*. Oxford: Oxford University Press.

13. MacBeath, J., Galton, M., Steward, S., MacBeath, A. and Page, C. (2006) *The Costs of Inclusion: A study of inclusion policy and practice in English primary, secondary and special schools.* Cambridge, University of Cambridge.

14. MacLure, Maggie et al (2008). *Becoming a Problem: How and Why Children Acquire a Reputation as 'Naughty' in the Earliest Years at School*: Full Research Report ESRC

15. Muijs, D. and Reynolds,D. (2005) *Effective Teaching: Evidence and Practice*. Second edition. London: Sage Publications.

16. Poulin, F, Dishion, T.J. and Burraston, B. (2001) 3-year iatrogenic effects associated with aggregating high-risk adolescents in cognitive-behavioral preventive interventions. *Applied Developmental Science*, 5, 214–224.

17. Rabe-Hesketh, S., Pickles, A. and Skrondal, A. (2001), GLLAMM: A General Class of Multilevel Models and Stata Program, *Multilevel Modelling Newsletter*, 13, 17-23.

18. Rabe-Hesketh, S., Skrondal, A. and Pickles, A. (2004), Generalized multilevel structural equations modeling. *Psychometrika*, 69, 167-190.

19. Skrondal, A. and Rabe-Hesketh, S. (2004), *Generalized Latent Variable Modelling*, Chapman & Hall/CRC.

20. Teddlie, C. and Reynolds, D. (2000) *International Handbook of School Effectiveness Research.* London: Falmer Press.

21. Waxman, H.C., Padron, N.Y. and Chang, H. (Eds) (2004) *Educational Resiliency: Student, Teacher, and School Perspectives*. Connecticut: Information Age Publishing.