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### Improving the School Learning Environment to Reduce Bullying: An Experimental Study

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## Improving the School Learning Environment to Reduce Bullying: An Experimental Study

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A framework based on research on bullying and on educational effectiveness was offered to schools to assist them in developing strategies and actions to improve their learning environment, their policy for teaching, and their evaluation mechanisms in order to reduce bullying. At the beginning and end of the intervention, the Revised Olweus Bully/Victim Questionnaire and a teacher questionnaire measuring three school factors (school policy for teaching, school learning environment, and school evaluation) were administered to the experimental and control groups. This experimental study reveals that the intervention had both a direct impact on the reduction of bullying and an indirect impact through improving the school factors. Implications for research into supporting schools to reduce bullying are given.

*Keywords:* School learning environment, school bullying, educational effectiveness research, multilevel modeling

Bullying is a significant educational problem in many countries, and can impair schools' effectiveness (Gu, Lai, & Ye, 2011; Kochenderfer & Ladd, 1996; Ttofi & Farrington, 2009). Research has shown that victims of aggressive behavior feel useless and experience depression, which is likely to have a negative effect on their learning and academic achievement (e.g., Kochenderfer & Ladd, 1996; Slee, 1994). School bullying is not simply an isolated, aggressive action between the "bully" and the "victim". It is rather a dynamic social relationship problem (Swearer, Espelage, & Napolitano, 2009), which is often a result of

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The research presented in this paper is part of a two-year project entitled "Designing evidence-based strategies and actions to face bullying by considering socio-ethnic diversities in school populations and evaluating their effects" funded by the European Commission's Daphne III Programme (Daphne Project: JLS/DAP/2007-1/226).

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hectic human relations involving a greater number of participants. As such, it is influenced by peers, families, schools, and communities. Consequently, the phenomenon of bullying should concern the entire school population, including all factors responsible for the quality of education (Espelage & Swearer, 2004). Research has also shown that bullying is very likely to negatively affect students' learning opportunities and increase teachers' levels of stress (Byrne, 1992; Nakou, 2000). Since bullying has negative implications for the functioning and role of various school stakeholders, whole-school approaches should be used to face it (Parada, Craven, & Marsh, 2008). Whole-school approaches are based on the assumption that programmes preventing school bullying should have multiple components that operate simultaneously at different levels in the school community, such as the student, teacher and school levels. During the past decade, various research syntheses of the effectiveness of whole-school approaches to bullying have been conducted (e.g., Farrington & Ttofi, 2011; Smith, Schneider, Smith, & Ananiadou, 2004; Wilson, Lipsey, & Derzon, 2003). These syntheses did not simply show that whole-school approaches have a positive impact on reducing bullying, but further recommended theoretically grounded interventions which are able to disentangle the effectiveness of different programme components in order to increase the effects of comprehensive school-based programmes (Baldry & Farrington, 2007; Rigby, Smith, & Pepler, 2005).

The project presented in this paper is based on the assumption that the theoretical foundation for developing whole-school approaches to face bullying may emerge through integrating research on bullying with Educational Effectiveness Research (EER). As previous research has shown, programmes aiming to reduce bullying are most successful when establishing a positive and safe school learning environment (Rigby et al., 2005). This finding seems to provide support to the assumption that a framework based both on research on bullying and on EER, which gives emphasis to the establishment of a school policy on bullying aiming to improve the school learning environment (SLE), could be offered to schools to assist them in identifying what can be achieved and how, in order to deal with and prevent bullying. Thus, the next section refers briefly to the theoretical background of the approach used to develop strategies and actions to face bullying through not only raising all school stakeholders' awareness of bullying and how to deal with it, but also through taking actions to improve the functioning of the SLE, the school teaching policy, and school evaluation. Below, we describe these three school factors, which are addressed by the proposed whole-school approach to bullying, and refer to studies illustrating that these factors are associated with bullying. Then, the methods and main results of the study are presented, and implications for using this approach to reduce bullying are offered.

### **A Whole-School Approach to Reducing Bullying Based on Research on Bullying and EER**

The framework used to conduct this project emphasizes the use of a whole-school approach to facing and reducing bullying. This approach is concerned with improving the following three school factors: (1) the school policy for teaching, (2) the school learning environment (SLE), and (3) the school evaluation. These factors were found to be associated not only with the achievement of learning outcomes, as EER has shown (e.g., Kyriakides, 2008; Kyriakides, Creemers, Antoniou, & Demetriou, 2010; Scheerens & Bokser, 1997; Teddlie & Reynolds, 2000), but also with a reduction in bullying (e.g., George & Thomas, 2000; Kyriakides & Creemers, in press; Olweus, 1997; Parada et al., 2008). Therefore, the

first stage of this approach focuses on explaining to school stakeholders why and how they may manage to reduce bullying by improving these three school factors. The second step gives emphasis to the collection of data on these three school factors and identification of the improvement priorities of each school. Based on the results of the school evaluation, support is provided to each school in order to develop its own strategies and actions to face and reduce bullying. The importance of dealing with the three factors addressed by the proposed approach is discussed below; the major steps of the intervention are described in the methods section.

### **A) School Learning Environment**

Modin and Ostberg (2009) argue that the extent to which bullying occurs in a school is not only a matter of differences in the composition of students of different background; it has also been empirically linked to school characteristics such as school climate, school culture, and the organization of the school. In this context, the following three aspects, which define the SLE factor, are seen as possible predictors of facing and reducing bullying at school level.

#### **Student behavior outside the classroom.**

Through the development of a clear policy on student behavior outside the classroom, valuable information about bullying incidents and targets (e.g., bullies, victims, bystanders, isolated students) can be collected. Research has shown that effective schools develop a policy concerning effective supervision of their students. Increased monitoring of student behavior during recesses and before the beginning of lessons can help school stakeholders to identify and intervene when bullying occurs (George & Thomas, 2000). School policy on this aspect of the SLE may encourage teachers to be visible and vigilant in such common areas as hallways, stairwells, canteen, the gym, and other hot spots where bullying occurs consistently. Increased supervision is also required in the bathrooms, where vandalism and disorder are more likely to occur.

Beyond monitoring student behavior outside the classroom, effective schools take action to improve the SLE. Although this type of action does not seem to be directly related to bullying, research has shown that such action may have an impact on the development of positive and desirable behavior, which can be characterized as respectful, reliable, and responsible (e.g., Creemers & Kyriakides, 2008; Ma, 2002; Opdenakker & Van Damme, 2000). As these characteristics (such as respect and responsibility) are found to be associated negatively with bullying, the proposed whole-school approach is based on the assumption that schools should find ways to develop them (see Lane, Kalberg, & Menzies, 2009).

Schools may also organize activities during break times (such as playing in cooperative groups, table games, music) which can calm students' aggressive emotions and increase their feelings of safety, happiness, and school enjoyment (see Swearer, Espelage, & Napolitano, 2009). Rewarding good behavior inside and outside the classroom can also be beneficial. For example, schools could set up a motivation system to improve the school's social environment by taking action to emphasize maintenance of the behavior code and the promotion of appropriate and positive behaviors outside the classroom (West, Sweeting, & Leyland, 2004). Thus, the school policy on student behavior outside the classroom is seen as an important factor associated with reduction of school bullying.

**Collaboration and interaction between teachers.**

In effective schools, teachers interact on issues associated with learning and teaching in order to create a business-like school and classroom environment (Creemers & Kyriakides, 2008; Muijs & Reynolds, 2001; Scheerens & Bosker, 1997). Interaction and collaboration among teachers can only be beneficial, and could boost SLE quality when focalized on the tasks that teachers undertake in their school environment (Teddlie & Reynolds, 2000; Kyriakides et al., 2010). Thus, the school management team may encourage their teaching staff to learn from each other by exchanging ideas and experiences on facing and reducing bullying (Olweus, 1997). For example, activities such as supervising students during break time can be appointed to pairs of teachers. By working collaboratively, teachers can discuss what they observe, exchange opinions, work out solutions and even present to the whole faculty the efforts they found effective in reducing bullying (Parada et al., 2008).

**Partnership policy: Collaboration with school stakeholders.**

Structures based on authentic partnership and collaboration with other stakeholders (e.g., parents, school advisors, school community, psychologists) may contribute to the implementation of actions to reduce and manage bullying and develop a safe, caring, respectful, and supportive school environment (Murray-Harvey & Slee, 2010). Research evidence shows that this aspect of the SLE factor is strongly associated with the achievement of cognitive and affective learning outcomes (Fan & Chen, 2001; Kyriakides, 2005; Waterman & Walker, 2009). By including staff, students, and parents in the creation and implementation of anti-bullying policies, the school management team may receive valuable input from all those directly affected (Smith & Brain, 2000). For example, at the beginning of the school year, schools may announce to parents their policy on bullying and ask them to provide feedback and suggestions about the policy and the actions that could be taken to reduce bullying. The active involvement of teachers, students, and parents in defining the school policy on bullying and the strategies and action plans to face bullying may encourage their active participation in implementing these action plans for improvement purposes, since school stakeholders are very likely to adopt a more positive attitude toward improvement projects when they are involved in developing the interventions, rather than simply implementing actions developed by a team of “experts” (Fullan, 2001). By establishing good relations not only with parents but also with the wider school community, effective schools make use of all available human and other learning resources in their attempts to face and reduce bullying incidents. For example, schools may invite educational psychologists to provide guidelines for helping teachers and parents to deal with bullying. Schools may also organize *school-based in-service training courses* on issues associated with the tasks that teachers are undertaking in the school to address attitudes and behaviors targeting thoughts, attitudes, and interpersonal and emotional skills. These courses may concern critical issues like anger management and emotion regulation skills, good listening skills, empathy, non-judgmental attitudes, ethnic identity, anti-prejudice, coping strategies for post-traumatic stress reaction, trust building, and communication skills (George & Thomas, 2000). Thus, this aspect of the SLE factor was taken into account in developing the proposed whole-school approach to reducing bullying, especially since this aspect of the SLE factor contributes to the further professional development of teachers in dealing with bullying (Modin & Ostberg, 2009).

### **B) School Policy for Teaching: Developing a Safe and Business-like Classroom Learning Environment**

Many studies have identified teachers as a key factor of change in bullying prevention (Hirschstein, Edstrom, Frey, Snell, & Mackenzie, 2007; Kallestand & Olweus, 2003). For example, there is evidence that classroom management not only promotes or inhibits academic attainment but also contributes to the overall relational climate of the classroom (Keller & Tapasak, 1997). Moreover, Chang (2003) found that although students as a whole reject aggressive behavior in school, peer rejection varied across classes as a function of teachers being warm toward or supportive of students overall. Furthermore, research has shown that effective teachers support their students academically by helping them to perform well and to know that they have performed well (Bru, Stephens, & Torsheim, 2002; Rigby, 2002). It was also found that perceived academic competence helps to prevent the development of norm-breaking behavior. This statement is supported by empirical studies indicating that opportunities for students to experience success in school are linked to a low incidence of student misbehavior and bullying (Rutter, Giller, & Hagell, 1998). When teachers provide clear explanations, students' perceptions of the meaningfulness of schoolwork may be improved and commitment to learning may be enhanced. Finally, EER has shown that effective teachers use different teaching strategies in order to keep different groups of students involved in classroom interactions, which promotes student learning and establishes better relations among students and teachers (Kyriakides & Tsangaridou, 2008; Muijs & Reynolds, 2001).

In this context, the whole-school approach proposed here is based on the assumption that in order to reduce bullying, schools should create not only a safe SLE, but also support their teachers to develop a safe Classroom Learning Environment (CLE). Recent meta-analyses of school-effectiveness studies reveal that the latter can be achieved by developing the school policy on teaching (see Kyriakides et al., 2010; Scheerens, Seidel, Witziers, Hendriks, & Doornekamp, 2005). Provision of learning opportunities for students is one of the most important aspects of school policy on teaching when dealing with bullying (Creemers & Kyriakides, 2012). Beyond addressing the aims included in the formal curriculum, the development of this aspect of teaching policy may encourage teachers to introduce relevant cognitive and affective aims targeted at reducing bullying (e.g., development of social cognition, understanding of social values, emotional recognition, and development of positive attitudes towards peers). Schools which are effective in facing and reducing bullying are those where teachers can stimulate their students by providing appropriate and well-designed learning opportunities targeting the achievement of relevant affective and cognitive aims (Rigby, 2002).

### **C) School Evaluation**

Evaluation is regarded in the literature as one of the most important factors for improving the effectiveness of schools (Kyriakides et al., 2010; Torres & Preskill, 2001). Effective schools are expected to develop evaluation mechanisms in order to investigate whether their strategies and actions for reducing bullying are effective (Ma, 2002; Stevens, Van Oost, & De Bourdeaudhuij, 2001). However, school evaluation should not only identify the extent to which bullying incidents are reduced; priorities for improving school policy on bullying should also be identified in order to help schools design their anti-bullying



strategies and actions. Formative evaluation mechanisms may also help school stakeholders modify their strategies and plans according to the circumstances and the specific needs of different groups (e.g., bullies, victims) of the school population. Thus, the proposed approach encourages and supports schools in their attempt to develop their own School Self Evaluation (SSE) mechanisms and identify those factors that need to be improved in relation to reduction of bullying.

### Research Aims

The general aim of this study is to find out whether helping schools to develop their own strategies and action plans to improve the three school factors mentioned above may have an impact on the reduction of bullying. Since the intervention attempts to integrate research on bullying with research on school effectiveness, we search for direct effects of this intervention upon the improvement of school factors and the reduction of bullying. We also search for indirect effects of the intervention on the reduction of bullying through improving the school factors.

### Methods

#### Participants

In each country, a group randomization study was conducted. Initially, 52 schools (Cyprus: 30, Greece: 22) were selected to participate in this study by using purposive sampling procedures, which enabled us to increase variation in respect to the bullying problems they face and the differences in terms of the student bodies' socio-ethnic backgrounds. A pre-measure with respect to the existing levels of bullying and the factors included in the theoretical framework of this intervention was conducted. Specifically, the Revised Olweus Bully/Victim Questionnaire (OBVQ) was administered to all grade 6 students in our school sample (Cyprus: 787 and Greece: 558). In addition, all teachers in our school sample completed a teacher questionnaire (Cyprus: 424, Greece: 172) measuring the functioning of school-level factors. A high response rate (Cyprus: 73%, Greece: 85%) was obtained. Analysis of the data collected during this phase revealed the existing anti-bullying techniques in each school and the schools' functioning in relation to the three school factors included in the theoretical framework of the proposed whole-school approach. Then, the participating schools were randomly split into an experimental and a control group (Table 1 provides information about participants in each group by country following a CONSORT 2010 Flow Diagram). No statistically significant difference at the .05 level was identified between these two groups of schools in relation to the background characteristics (i.e., gender, socio-economic status [SES], ethnicity) of their grade 6 students (Kyriakides, Bosker, Muijs, Papadatos, & Van Petegem, 2011). The experimental group was asked to develop strategies and action plans to reduce bullying by addressing the school factors. The research team provided feedback to the second group of schools (control group) about the results that emerged from the pre-measure. Support was also provided to these schools to develop strategies and actions to reduce bullying, addressing any factor they considered important and without taking into account the findings of research on bullying and research on school effectiveness. Below, the intervention is outlined and the support provided to the schools in the control group is described.

Table 1

*Number of Participating Schools and Students in Each Experimental and Control Group by Stage of Intervention*

	Cyprus				Greece			
	Experimental group		Control group		Experimental group		Control group	
	<i>Schools</i>	<i>Students</i>	<i>Schools</i>	<i>Students</i>	<i>Schools</i>	<i>Students</i>	<i>Schools</i>	<i>Students</i>
Allocation – Participation in the first measure	15	403	15	384	11	266	11	292
Participation in the last measure	15	394	15	372	11	259	11	283
Used in the multilevel SEM analysis (i.e., those with a completed set of data)	15	381	15	358	11	248	11	276

*Note.* The missing values (no more than 7%) were due to students who were absent during the final administration of the bullying measure.

**The Intervention**

At the first stage, the research team had a meeting with the staff of each school, in which the importance of addressing the three school factors associated with reduction of bullying was discussed (see previous section). During this meeting, we also discussed and agreed on the importance of collecting evaluation data in order to identify each school’s improvement priorities. In the second step, data on the function of each factor were collected from the research team. By analyzing the data, improvement priorities for each school were identified. As a consequence, each school developed strategies and action plans addressing specific factor(s) included in the theoretical framework of this intervention (see previous section). The third step is one of the most important steps of this approach: The research team should work closely with the school stakeholders in order to help them define their strategies and action plans for improvement. School stakeholders are expected to take into account the available knowledge base of research on bullying and research on educational effectiveness, and adapt the guidelines that have emerged from the literature in relation to their school context (with the help of the research team). Then school stakeholders and the research team should develop mechanisms for monitoring the implementation of the intervention. At this point, the research team should stress the role of formative evaluation and the importance of using evaluation data to further develop the school-improvement strategies and action plans. At the end of the school year, the impact of this approach on improving school factors and reducing bullying is measured. More information about each step is provided below, where the differences in the approach used by the control group are also explained.

At the first stage of the intervention, training and guidelines on the three school factors were offered to the schools in the experimental group within each country. A handbook presenting the theoretical framework was produced. The handbook included the rationale of the project and clarified the importance of the school factors that need to be addressed. The role of the research team was also made clear. The research team promised to provide support to



school stakeholders in carefully setting up their own strategies and action plans for facing and reducing bullying. Moreover, the research team was responsible for helping schools identify what could be achieved with ease, as well as when and how this could be done in order to deal with and prevent bullying. As a consequence, the aim of the handbook was mainly to help schools develop and implement their strategies and action plans, by providing concrete and specific guidelines to school stakeholders on how to identify priorities for improvement and design their strategies and actions to improve school factor(s) associated with the reduction of bullying. The handbook can be accessed from the project's web page (<http://www.ucy.ac.cy/jls>).

At the second stage of the intervention, data on the functioning of the school factors were collected and the research team provided feedback to each school indicating its priorities for improvement. School stakeholders had the chance to discuss the SSE findings and decide whether their action plans would address one or a combination of priorities concerning the three factors included in the theoretical framework of the study. It was strongly recommended that decisions on their priorities for improvement should not be taken only by the teachers and the school management team: Students and parents should also be actively involved in the decision-making process itself. For this reason, schools were encouraged to establish a committee with representatives of parents, students, and teachers to discuss the results and gradually reach a consensus about their school's improvement priorities and how to deal with them. The final decision was announced to the whole school community and feedback was provided.

At the third stage of the intervention, school stakeholders (in cooperation with the research team) developed their strategies and action plans addressing specific aspects of the improvement area that they had identified in the previous stage. It was explicitly stated in the action plan that it is important not only to *specify the activities* to be undertaken, but also to indicate *who is supposed to do it*, what the *time-scale* is, and what *resources* are needed. At this point, the schools were reminded to make use of the suggestions and additional reading sources provided in the handbook in order to develop their action plans. The schools participating in the intervention did not have to develop the same strategy and undertake the same activities, since each school was in a position to identify its own improvement priorities. Action plans of two different schools addressing the same factor may refer to undertaking different tasks. This is due to the fact that the approach proposed here takes into account the contingency theory and expects schools to adapt the guidelines offered by the research team according to their own context (see Creemers & Kyriakides, 2012). Appendix A refers to the actions which one school had to undertake in order to improve the functioning of the school policy on students' behavior outside the classroom. Those seeking information about the support provided to the schools to develop their action plans can look at the project handbook, where specific activities associated with each factor were recommended to school stakeholders (see <http://www.ucy.ac.cy/jls>).

Beyond designing action plans, school stakeholders were further asked to take decisions regarding monitoring the implementation. For example, some schools decided that a log book should be kept by the coordinator of the intervention, who also had to share his/her experiences/views with the management team and other stakeholders. If a problem arose in implementing certain aspects of the action plans, school stakeholders (in cooperation with the research team) had to modify their action plans and/or provide support to those stakeholders not in a position to implement particular tasks included in the action plans.

In the next stage, the intervention was implemented. This lasted for approximately eight months. The research team provided support to the school stakeholders by helping them overcome difficulties and problems that emerged during the implementation of their action plans. Moreover, the research team helped school stakeholders to use their formative evaluation data in order to modify their strategies and plans according to the circumstances and specific needs of different groups within the school population. The apt modification of action plans was found to contribute to achieving the intervention's aims and reduce the chance of a school discovering only too late that no progress had been made throughout the school year due to the poor implementation of its action plans.

In order to evaluate the impact of the project, a summative evaluation was conducted. For the purposes of the summative evaluation, the Revised OBVQ was administered to both the experimental and the control groups of schools not only at the beginning, but also at the end of the intervention. Moreover, data on the functioning of school factors were collected both at the beginning and the end of the intervention. In order to measure the impact of the intervention, we made sure that each group of schools received the same amount of support from the research team and the only difference between the two groups related to the fact that the experimental group developed strategies and actions to address the three school factors by taking into account the results of the school evaluation, whereas the control group received feedback about the functioning of the school factors but were free to develop strategies and actions that addressed any factors they perceived as important. The research team was available to both groups of schools to support them in implementing their own improvement efforts aiming to reduce bullying. In this way, it was possible to test the main assumption of this whole-school approach to bullying, and particularly whether schools which were encouraged to develop strategies and action plans to improve the functioning of school factors managed to reduce bullying, as these factors were found to predict the school's effectiveness status in regard to reducing bullying (Kyriakides & Creemers, in press). The main variables of the study are presented below, while the next section provides the main results of this project.

### Main Variables of the Study

**Using the OBVQ to measure the extent to which students are being victimized (scale A) and bullying others (scale B).** The OBVQ is a revised version of an earlier instrument developed by Olweus (1978). It is based on the definition of bullying proposed by Olweus (1993), and consists of 40 questions for the measurement of significant aspects of bully/victim problems, such as the initiation of various forms of bullying of other students, where the bullying occurs, and the extent to which teachers, peers, and parents are informed about and react to the bullying (Olweus, 1997). The questionnaire content derives from the main findings of studies conducted on bullying in several countries (e.g., Garcia & Perez, 1989; Genta, Mene-sini, Fonzi, Costabile, & Smith, 1996; Mellor, 1990) which show that three forms of bullying are consistently identified: physical, verbal, and indirect bullying (Besag, 1989; Morita, 1985; Olweus, 1993; Sharp & Smith, 1994). The OBVQ is divided into two parts. Part I (questions 5–24) refers to the initiation of an act of bullying against the child who is answering the questionnaire, whereas Part II (questions 25–40) refers to the expression of bullying behavior against others by this child. The duration and frequency of the problem are also examined, as these dimensions distinguish between a bullying act and an accidental incident.

While there is no denying that the OBVQ has proven useful to teachers, researchers, and educational authorities, this instrument only provides data at the nominal or ordinal level and not at the interval level. For this reason, a powerful measurement model (the Rasch model) was applied to our data to construct interval-level measures of the two main constructs (being victimized and bullying others) measured by the OBVQ (Kyriakides, Kaloyirou, & Lindsay, 2006). By using the Rasch model to analyze our data, it was possible to investigate the conceptual structure of the OBVQ (its meaning and validity) and test whether it was targeted correctly (that is, if the pupils' measures and the item difficulties could be represented on the same scale).

Taken individually, eight items of the OBVQ can be used to interpret the responses with respect to the extent to which pupils are victims of bullying (items 6–13), whereas a second set of eight items refers to the extent to which pupils initiate acts of bullying against other children (items 26–33). For each measurement occasion (i.e., before and after the intervention), data that emerged from OBVQ were analyzed using the computer program Quest (Adams & Khoo, 1996). Two scales were created based on the log odds of students' opinions on the extent to which they are either being bullied (scale A) or bully other children (scale B). Analysis of data on student responses to the items of each scale of OBVQ revealed that each scale had relatively satisfactory psychometric properties. Specifically, the indices of cases (i.e., students) and item separation were higher than 0.75 for each of the scales, indicating that the separability of each scale was relatively satisfactory (Wright, 1985). Moreover, the infit mean squares and the outfit mean squares of each scale were near one and the values of the infit  $t$  scores and the outfit  $t$  scores were approximately zero. Furthermore, each analysis revealed that all items had item infit in the range of 0.84 to 1.19. It can therefore be claimed that each analysis revealed there was a good fit to the model (Keeves & Alagumalai, 1999). Thus, for each student participating in the intervention, it was possible to generate two different scores for each of the two scales of OBVQ by calculating the relevant Rasch person estimates that emerged in the two measurement periods (i.e., before and after the intervention). These Rasch person estimates were taken into account in measuring the impact of intervention upon reduction of bullying.

**Using a teacher questionnaire to measure school factors.** The explanatory variables referring to the school-level factors were measured by asking the teachers to complete a questionnaire. A Likert scale was used to collect data on teachers' perceptions of the school-level factors. For example, teachers were asked whether the "school policy regarding bullying has been presented to the children's parents". This item is concerned with the school learning environment factor, and especially with the partnership policy of the school. Similarly, a typical example of an item used to measure the school evaluation factor is as follows: "Aspects of my school's policy on dealing with bullying which are considered problematic are evaluated *more often* and/or *in more detail*". The teacher questionnaire can be found on the project web page (<http://www.ucy.ac.cy/jls>) and was developed in three languages (Dutch, English and Greek).

Since it is expected that teachers within a school view the policy of their school and the evaluation mechanisms of their school similarly, but differently from teachers in other schools, a generalizability study was conducted. It was found that for all the questionnaire items, the object of measurement was the school. Then reliability was computed for each of the dimensions of the school factors by calculating multilevel  $\lambda$  (Snijders & Bosker,

1999) and Cronbach's alpha for data aggregated at the school level. The value of Cronbach's alpha represents consistency across items, whereas multilevel  $\lambda$  represents consistency across groups of teachers. In each country, the reliability coefficients were found to be satisfactory (i.e., around 0.80). Using Mplus (Muthén & Muthén, 1999), the intra-class correlations of the scales were also computed. It was found that the percentages of variance at the between level (school level) were between 37 and 48. These percentages are rather high compared to other instruments that measure perceptions of people or objects in clustered or interdependent situations (den Brok, Brekelmans, Levy, & Wubbels, 2002). Cronbach's alpha (reliability), Multilevel Lambda (consistency), and intra-class correlations (ICC) of scales that emerged from teacher questionnaires concerned with each dimension of each school factor per country can be found in the project report (see Kyriakides, Bosker, Muijs, Papadatos, & Van Petegem, 2011, Table 2.3) which can be downloaded from the project webpage (<http://www.ucy.ac.cy/jls>).

A first-order Confirmatory Factor Analysis (CFA) model designed to test the multidimensionality of research instruments was used to examine the construct validity of the questionnaire measuring the school factors (Byrne, 1992). Specifically, the model hypothesized that: (1) the nine variables (i.e., scale scores measuring each aspect of the three school factors) could be explained by the three factors concerned with the school learning environment, the school policy for teaching, and the school evaluation; (2) each variable would have a nonzero loading on the factor it was designed to measure and zero loadings on all other factors; (3) the three factors would be correlated; and (4) measurement errors would be uncorrelated.

For each measurement period, the findings of the first-order factor SEM analysis generally affirmed the theory upon which the questionnaire was developed. Although the scaled chi-square for the five-factor structure (i.e., before the intervention:  $X^2 = 52.8$ , d.f. = 24,  $p < .001$ ; after the intervention:  $X^2 = 53.2$ , d.f. = 24,  $p < .001$ ) was statistically significant, as expected, the values of RMSEA (before: 0.026; after: 0.028) and CFI (before: 0.981; after: 0.985) met the criteria for acceptable level of fit. Kline (1998, p. 212) argues that "even when the theory is precise about the number of factors of a first-order model, the researcher should determine whether the fit of a simpler, one-factor model is comparable". Criteria fit for a one-factor model (before:  $X^2 = 248.4$ , d.f. = 27,  $p < .001$ ; RMSEA = 0.143 and CFI = 0.473; after:  $X^2 = 319.4$ , d.f. = 27,  $p < .001$ ; RMSEA = 0.144 and CFI = 0.474) provided values that fell outside the generally accepted guidelines for model fit. Thus, for each school, three scores of the factors concerned with (1) the school learning environment, (2) the school policy of teaching, and (3) the school evaluation were generated by aggregating at the school level the factor scores that emerged from teacher responses to the questionnaire administered to them at the beginning of the intervention. Similarly, for each school, three school-factor scores were obtained by taking into account the teachers' responses to the questionnaire at the end of the intervention.

## Results

The first and second part of this section refer to the impact of the intervention upon the dependent variables of the study (i.e., improvement of school factors and reduction of bullying). The third part is an attempt to test the main assumption of this project and to identify

whether the intervention had not only a direct effect on reduction of bullying, but also an indirect effect through improving the functioning of school factors.

### The Impact of Intervention on Improving the Functioning of School Factors

Table 2 presents the means and standard deviations of the four school-level overarching factor scores before the implementation of the intervention and at the end of the intervention in the experimental and control schools. Although a repeated measures MANOVA of treatment (following the proposed approach/not following the proposed approach) by time {before (i.e. pre) /end (i.e. post)} could have been carried out with the three factor scores (i.e., policy on teaching, school learning environment, and school evaluation) as dependent variables, we decided to compare the school factor scores of these two groups by using non-parametric statistical tests due to our small sample size at the school level (i.e., 26 schools in each group). Siegel and Castellan (1988) argue that when the sample size is small, non-parametric tests are preferable to parametric tests even when interval data have been collected. In addition, Dixon (1954) claims that when compared with the *t*-test, the Kolmogorov-Smirnov Test has high power efficiency (about 96%) for small samples. Thus, the Kolmogorov-Smirnov Two Sample Test was initially employed to identify any statistically significant difference between the two groups in terms of the functioning of the school factors before the intervention. No statistically significant difference was identified at the .05 level. This implies that the two groups were performing equally well in relation to the functioning of the three overarching school factors. However, at the end of the intervention, the Kolmogorov-Smirnov Two Sample Test revealed statistically significant differences at the .05 level between these two groups of schools in relation to each school factor (see Table 2). Moreover, the Wilcoxon Test was used to identify whether there was any statistically significant progress in the performance of each group of schools in relation to the school factors. Only the schools in the experimental group managed to improve the functioning of their school factors at a statistically significant level ( $p < .05$ ).

Table 2

*Means and Standard Deviations of the Functioning of Each Overarching School Factor in the Experimental and Control Schools and Values of the Kolmogorov-Smirnov Two-Sample Test*

Overarching school factor	Experimental school		Control school		K-S Z	p
	Mean	S.D.	Mean	S.D.		
<b>A) Before the intervention</b>						
School policy for teaching	3.80	1.13	3.73	1.02	0.23	0.81
School learning environment	3.47	0.93	3.27	0.76	0.85	0.39
School evaluation	3.72	1.03	3.68	0.96	0.15	0.88
<b>B) At the end of the intervention</b>						
School policy for teaching	4.25	0.97	3.71	0.89	2.09	0.04
School learning environment	4.02	0.86	3.51	0.75	2.28	0.03
School evaluation	4.19	0.90	3.69	0.89	2.02	0.05

### The Impact of the Intervention on Reducing Bullying

In order to measure the impact of the intervention on reducing bullying, we conducted two separate multilevel analyses of the student estimates that emerged from using the Rasch model to analyze data from each of the two scales of the OBVQ. The OBVQ was administered to the student sample at the beginning and end of the intervention and thereby the prior measure was also taken into account. The first step in the analysis was to determine which levels had to be considered in order to reflect the hierarchical structure of the data. Empty models with all possible combinations of the levels of analysis (i.e., student, class, and school) were established and the likelihood statistics of each model were compared (Snijders & Bosker, 1999). It was found that an empty model consisting of student and school level represented the best solution. This was a common finding that emerged from analyzing students' final Rasch scores in each of the two scales of OBVQ and the relevant within-country analyses. One could attribute these findings to the fact that bullying incidents are very likely to occur outside the classroom, so the school rather than the classroom effect is more important.

Table 3 illustrates the parameter estimates and standard errors derived from the multilevel analysis of student scores in each scale of the OBVQ. The first model presents the variance at individual and school level without explanatory variables (empty model or model 0). The figures of the empty model reveal that approximately 10% of the variance in the extent to which students are either being bullied (scale A) or bully others (scale B) was at the school level. In Model 1, background factors at student and school level were added to the empty model. The likelihood statistic ( $X^2$ ) shows a significant change between the empty model and Model 1 ( $p < .001$ ) for both scales. We can also observe that only the effect of prior measure was statistically significant, whereas gender, SES, and ethnicity did not have any effect on the extent to which students either were being bullied or bullied others. In Model 2, the three overarching school factors were added to Model 1. For each scale, the school factors were found to be associated with the reduction of bullying. This finding provides further support to the proposed theoretical framework's assumption that the school factors are associated with reduction of bullying. Finally, the impact of using the proposed whole-school approach to the reduction of bullying was measured by entering a relevant dummy variable (with schools in the control group as the reference group). The figures shown in Table 3 reveal that the schools in the experimental group managed to reduce bullying at a much higher level than the schools in the control group. Within-country analyses were also conducted by using the above procedure and a variation in the reported effect sizes was observed. Table 4 summarizes the main results on the impact of the intervention which emerged from each within-country analysis for each of the two scales of the OBVQ. The fixed effects obtained with multilevel analysis can readily be converted to standardized effects of "Cohen's  $d$ " by dividing them by the standard deviations in the "treatment group" which made use of the proposed approach to face bullying. The reported effect sizes reveal that the intervention had higher effects in Cyprus than in Greece. Given the fact that the intervention lasted for eight months, it can be claimed that in both countries, the intervention had a relatively high impact on reducing bullying.

### Searching for Direct and Indirect Effects on Reduction of Bullying

In this section, the main theoretical assumption of the proposed whole-school approach is tested and its impact on reducing bullying is examined. The proposed approach is based



Table 3

*Parameter Estimates and (Standard Errors) for the Analysis of Student Scores in Each Scale of OBVQ (students within schools)*

Factors	SCALE A				SCALE B			
	Model 0	Model 1	Model 2	Model 3	Model 0	Model 1	Model 2	Model 3
Fixed part (Intercept)	-2.12 (.09)	-1.05 (.09)	-0.34 (.10)	-0.21 (.06)	-3.03 (.04)	-1.92 (.04)	-1.34 (.05)	-0.77 (.05)
<i>Student Level</i>								
<u>Context</u>								
Prior Measure		0.71 (.02)**	0.71 (.02)**	0.71 (.02)**		0.63 (.02)**	0.63 (.02)**	0.63 (.02)**
Sex (0 = boys, 1 = girls)		-0.08 (.06)	-0.08 (.06)	-0.08 (.06)		-0.06 (.05)	-0.06 (.05)	-0.06 (.05)
Ethnicity (0 = Greek, 1 = other)		0.09 (.06)	0.08 (.06)	0.09 (.06)		0.04 (.06)	0.04 (.06)	0.03 (.05)
SES		-0.15 (.12)	-0.16 (.12)	-0.14 (.12)		-0.08 (.09)	-0.08 (.10)	-0.08 (.10)
<i>School Level</i>								
<u>Context</u>								
Average prior measure		0.16 (.03)**	0.16 (.03)**	0.16 (.03)**		0.11 (.03)**	0.11 (.03)**	0.10 (.03)**
Average SES		-0.04 (.04)	-0.04 (.04)	-0.05 (.04)		-0.03 (.06)	-0.03 (.06)	-0.03 (.06)
Percentage of boys		0.08 (.06)	0.08 (.06)	0.08 (.06)		0.07 (.05)	0.08 (.06)	0.08 (.06)
Percentage of Cypriots		-0.05 (.03)	-0.04 (.03)	-0.05 (.03)		-0.04 (.05)	-0.04 (.05)	-0.04 (.05)
<u>School factors</u>								
Policy on SLE			-0.13 (.04)**	-0.13 (.03)**			-0.15 (.04)**	-0.15 (.03)**
Policy on teaching			-0.08 (.03)**	-0.08 (.03)**			-0.07 (.03)*	-0.07 (.03)*
School evaluation			-0.10 (.03)**	-0.10 (.03)**			-0.09 (.03)**	-0.10 (.03)**

*(Continued.)*

Factors	SCALE A				SCALE B			
	Model 0	Model 1	Model 2	Model 3	Model 0	Model 1	Model 2	Model 3
<u>Daphne Intervention</u>				-0.76 (.11)**				-0.45 (.06)**
Variance components								
School	10.6%	10.1%	8.7%	5.8%	9.1%	7.8%	6.7%	5.8%
Student	89.4%	42.8%	42.7%	42.5%	90.9%	48.1%	48.0%	51.2%
Explained		47.1%	48.6%	51.7%		44.1%	45.3%	43.0%
Significance test								
X <sup>2</sup>	1749.1	1318.0	1102.1	990.4	2321.4	1167.0	1051.0	980.1
Reduction		431.1	215.9	111.7		1154.4	116.0	70.9
Degrees of freedom		2	3	1		2	3	1
p-value		.001	.001	.001		.001	.001	.001

\*Statistically significant effect at level .05.

\*\* Statistically significant effect at level .01.

Table 4

*Effect of Using the Proposed Approach on Reducing the Extent to Which Students: a) Are Being Bullied (scale A) and b) Bully Others (scale B) Expressed as Cohen's d*

Country	SCALE A			SCALE B		
	Effect	Pooled S.D.	Cohen's d	Effect	Pooled S.D.	Cohen's d
Cyprus	0.94	1.19	0.79	0.53	0.98	0.54
Greece	0.39	0.94	0.42	0.31	0.96	0.32
Total	0.76	1.08	0.70	0.45	0.98	0.46

on the assumption that improving the functioning of school factors can aid schools in becoming more effective and reducing bullying incidents. Thus, the following three conceptual models were used to test the effect of the intervention on the reduction of bullying, as measured by comparing students' scores on each scale of the OBVQ, both before and after the intervention was put into practice: (1) the direct effect model, (2) the indirect effect model, and (3) the direct and indirect effect model. In the first model, we assume that the intervention has only direct effects upon each of the two indicators that measure reduction of bullying and upon improvement of the functioning of school factors. It is also assumed that for each scale of the OBVQ, student factors (i.e., gender, SES, ethnicity) and prior Rasch measures have direct effects on students' final score (see Figure 1). In the second model, we did not expect any direct effect of the intervention on either of the two

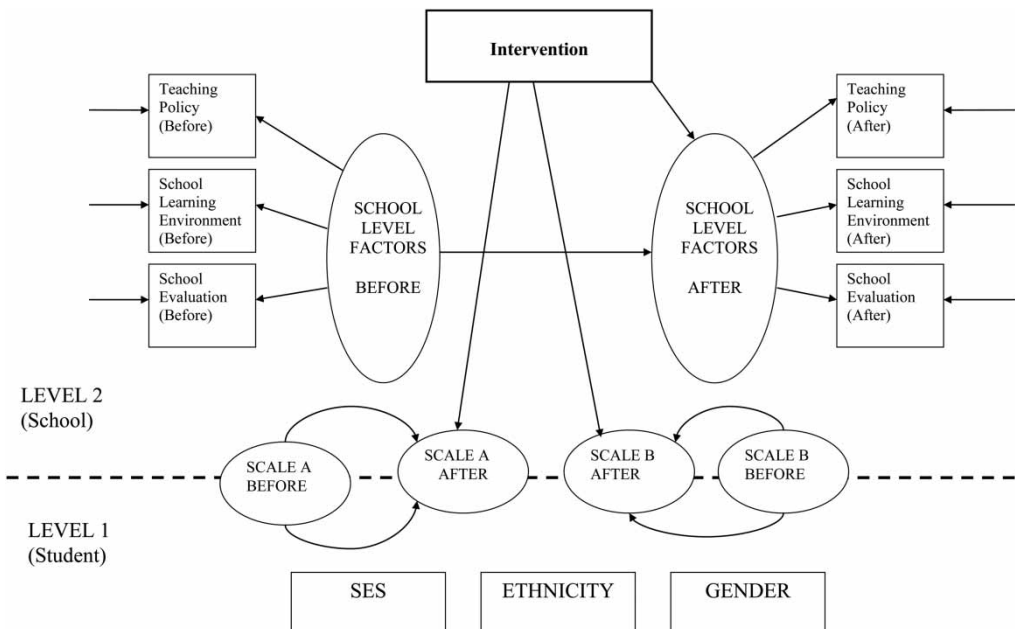


Figure 1. The theoretical multilevel model supporting that DASI had only direct effects upon reduction of bullying.

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indicators measuring the reduction of bullying. It was only the indirect effects for improving the functioning of school factors that were assumed to have an effect on students' final score in the second model (see Figure 2). Finally, the third model is based on the assumption that the intervention has both direct and indirect effects on the students' final score in each scale of the OBVQ. For the purposes of this analysis, MPlus (Muthén & Muthén, 2001) was used to test the three conceptual models and identify which of the three models fit our data most accurately.

Model fit statistics for each of the three models are reported in Table 5. We can observe that Model 3 fits the data best. Specifically, the *p* value for the chi-square test of Model 3 was found to be higher than 0.05. Moreover, both the CFI and the Tucker-Lewis Index (TLI) were higher than 0.95. As far as the value of the RMSEA is concerned, it was lower than 0.06. These results reveal that Model 3 fits well to the data (see Hu & Bentler, 1999). Figure 3 illustrates the best-fitting model. The estimated standardized parameters are also presented (standard errors are put in parentheses). All parameter estimates are statistically significant at the .01 level. At the lowest level, none of the background variables (i.e., SES, ethnicity, and gender) were found to be associated with any of the two indicators measuring bullying at the end of the intervention. The same finding emerged when the three background variables were aggregated at the school level. On the other hand, each pre-measure was found to be a good predictor of its final measure of bullying both at the student and the school level. This finding provides support to the predictive validity of the OBVQ. At the school level, the figure also reveals that the use of the proposed whole-school approach had a positive direct impact on the reduction

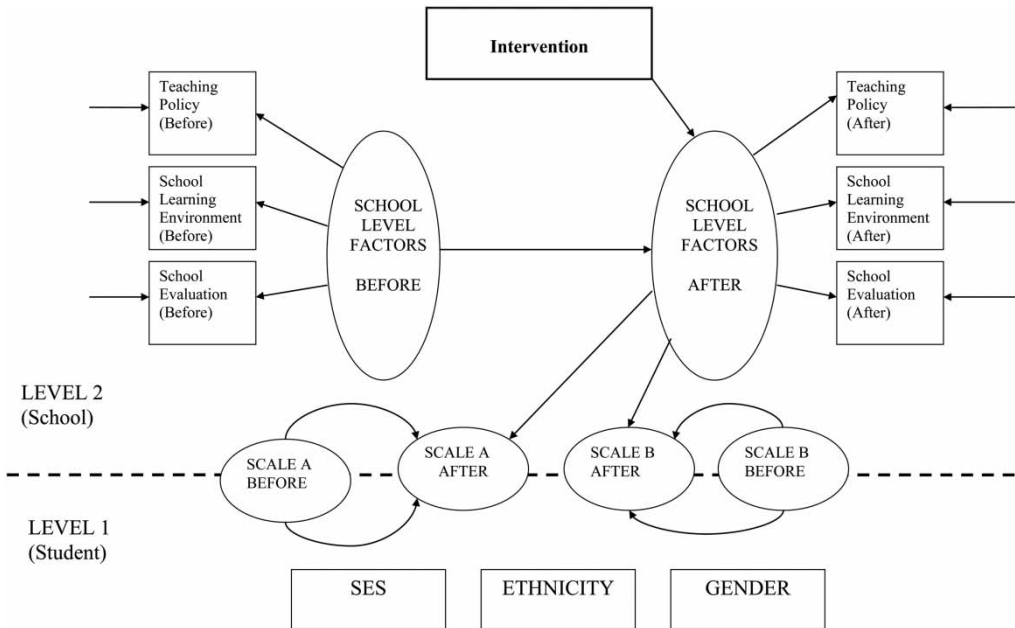


Figure 2. The multilevel model supporting that DASI had only indirect effect upon reduction of bullying.

Table 5

Summary of Fit Results for the Three Alternative Models Concerned With the Effect of Intervention upon the Reduction of Bullying

Alternative models	X <sup>2</sup>	Df	p	CFI	TLI	RMSEA	SRMR(B)	SRMR (W)
1) The direct effect model	175.4	54	.001	.94	.93	.12	.170	.011
2) The indirect effect model	169.2	54	.001	.95	.94	.10	.167	.009
3) The direct and indirect effect model	58.9	52	.238	.98	.99	.04	.125	.007

Note. CFI = Comparative Fit Index; TLI = Tucker-Lewis Fit Index; RMSEA = Root Mean Square Error of Approximation; SRMR(W) = Square root mean error for the student level; SRMR(B) = Square root mean error for the school level.

of bullying. An indirect effect upon the reduction of bullying can also be identified due to school use of the approach which improved the functioning of school factors. It is important to take into consideration that the measures of the three school-level factors were found to belong to a single latent variable, implying that the school-level factors are related to each other. Thus, the results of the SEM analysis provide support to the main assumption upon which this intervention was based. This is due to the fact that the intervention was found to have both direct effects on bullying and indirect effects through improving the functioning of school factors.

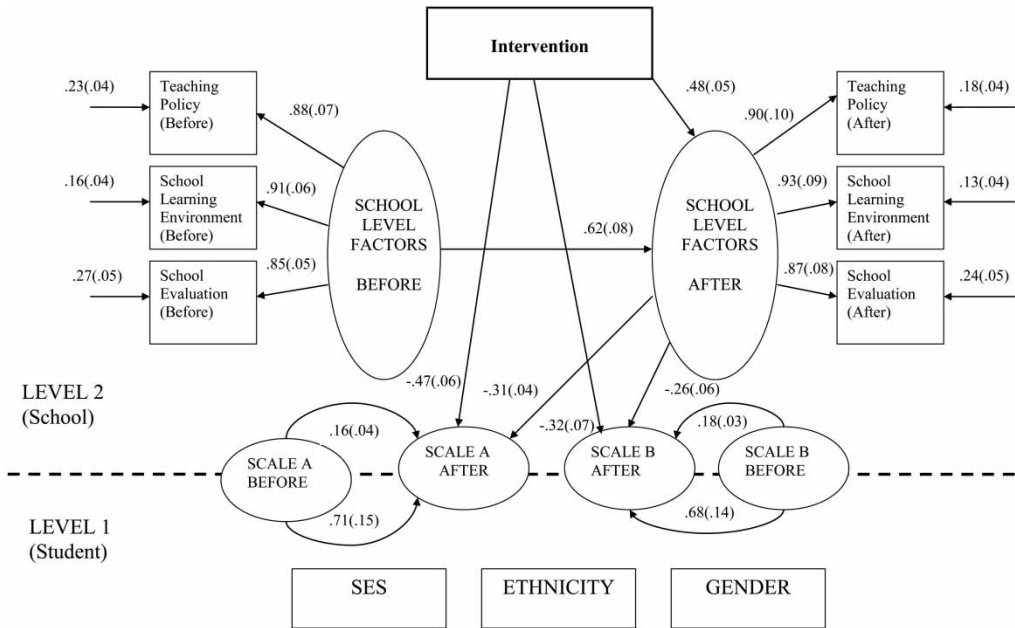


Figure 3. The multilevel model illustrating the direct and indirect effects of DASI upon reduction of bullying in Cypriot and Greek primary schools.

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### Implications

Implications can be drawn from the findings of this project for the development of effective policies and practices in reducing bullying. First, the results of this project reveal that the proposed approach had a direct effect on improving school factors and both direct and indirect effects on reducing bullying. In both countries, schools which made use of the approach managed to reduce the extent to which their students were being victimized (Scale A) and the extent to which their students bullied others (Scale B) more than schools which did not make use of this approach. Given that the intervention took place for only eight months, the observed total effect sizes in both countries can be treated as satisfactory. It is also important to note that a recent meta-analysis refers to smaller effect sizes of school-based bullying interventions than those reported in this study (Farrington & Ttofi, 2011). This result might be attributed to the fact that each school was given the opportunity to identify its improvement priorities and develop strategies and action plans addressing a factor functioning less well than others. In this way, the intervention that took place in each school was more focused than in other whole-school bullying interventions. Moreover, school stakeholders were given the opportunity to adapt the guidelines offered by the research team according to their school's context by taking into account the skills and abilities of stakeholders that were asked to implement them. Finally, each school had to develop a formative evaluation mechanism, and in this way the action plans had to be revised many times during the school year. Further research is needed to measure the added value of each distinctive element of the proposed approach to school improvement. For example, a multi-treatment experimental study might be conducted investigating the importance of not only establishing strategies and action plans that address schools' improvement priorities, but also formative evaluation mechanisms for the continuous development of the strategies and action plans of schools.

Second, this study seems to provide some empirical support to the assumption that schools should take action to improve the functioning of their school factors (i.e., SLE, school policy on teaching, and school evaluation); in this way, reduction of bullying may also be achieved. Specifically, Figure 3 shows that there is an indirect effect of the intervention on reduction of bullying through improving the functioning of school factors. These findings provide some support to the main assumption of this intervention which attempts to provide support to schools to improve the functioning of school factors in order to reduce bullying. One could however claim that this intervention has several distinctive elements that contribute to the improvement of the functioning of factors and, through that, to the reduction of bullying. More specifically, a theoretical framework is offered to schools in order to help stakeholders understand how and why the improvement of specific factors is associated with reduction of bullying. Through helping teachers understand that these factors matter, it is expected that teachers may be encouraged to take action to develop and implement the school policy on reducing bullying (Creemers & Kyriakides, 2012). In addition, teachers are supported by the research team to identify their priorities of improvement and take actions to improve the functioning of those factors that are associated with these priorities. In this way, a more focused intervention takes place. This element is in line with research on effective school reforms advocating more focused school improvement interventions (Borman, Hewes, Overman, & Brown, 2003; Brundrett, 2012; Good, Wiley, & Sabers, 2010; Hallinger & Heck, 2011). Another distinctive element of this intervention has to do with the fact that schools are neither left alone to develop strategies and action plans, nor



expected to develop a fixed set of action plans defined by the research team. This element is in line with the use of a theory-driven school improvement and with the contingency theory, both of which were taken into account in developing this intervention (see Creemers & Kyriakides, 2012). Finally, it is important to note that schools are expected to develop and implement not only strategies and action plans to reduce bullying, but also formative evaluation mechanisms which may help them continuously develop their action plans. In order to achieve this aim, the research team is also expected to support schools and help them take decisions on how to further improve their action plans. This element is supported by research on the role of formative evaluation in developing school improvement strategies (Devos, 1998). Thus, the proposed approach takes into account not only the major findings of school-effectiveness research, but also the main lessons which have emerged from evaluation studies of school reforms.

Third, this study shows that improvement of school factors had an impact on the reduction of bullying. Since most of the studies investigating the impact of school factors on bullying were cross-sectional (e.g., Baker, 1998; Weisshew & Peng, 1993), one could claim that the relationships between school factors and bullying are bidirectional and/or that bullying may alter the school and classroom learning environment (and not that these factors have an impact on bullying). By conducting a group randomization study and using a multilevel SEM approach, it was possible to search for the mediating effects of this intervention on reduction of bullying. The findings of the SEM analysis show that improvement of school factors had an impact on the reduction of bullying. Thus, this study seems to provide support for researchers' and school stakeholders' attempts to develop projects aiming to reduce bullying through improving the SLE. Although further research is needed to test the generalizability of this study's findings, it is important to note that this whole-school approach was implemented in two different countries and some support seems to be provided for the argument that the proposed approach can be used in different contexts for reducing bullying. International studies investigating the impact of the proposed approach on facing and reducing bullying may help us develop this approach further and identify under which conditions this approach may have a stronger impact on reducing bullying.

Finally, the limitations of this study should be acknowledged. Different types of support were provided to two groups of schools to establish strategies and action plans for reducing bullying. To control for the Hawthorne Effect, we first provided support to each group and made sure that the same amount of time and effort was allocated to each treatment group. In addition, neither group was aware of the type of treatment offered to the other group, in order to avoid compensatory rivalry or resentful demoralization on the part of any of the experimental groups (Shadish, Cook, & Campbell, 2002). However, it should be acknowledged that we were not in a position to measure the effort that each school put in to implementing this intervention. Therefore, we could not search for any differences between the two groups in terms of this variable. The effort variable may explain variation within each group of schools on the intervention's impact on the reduction of bullying (see Demetriou & Kyriakides, 2012). Further studies are needed to control for the impact of the effort each school put into implementing its action plans. In addition, a multi-treatment experimental study may help us identify the impact that each element of the proposed whole-school approach may have on improving the functioning of factors and on reducing bullying. Such studies may also help us identify the reasons why not only indirect but also direct effects on reduction of bullying can be observed. One could argue that the direct effect of the intervention can partly be attributed to differences in the effort put in by schools in

these two groups with regard to implementing their strategies to reduce bullying. Nevertheless, what is more important in this study is that the multilevel SEM analysis helped us to demonstrate that the intervention had an indirect effect on reducing bullying through improving the functioning of school factors. In this way, the main assumption of this whole-school approach to facing and reducing bullying is empirically supported.

### References

- Adams, R. J., & Khoo, S. (1996). *Quest: The interactive test analysis system, Version 2.1*. Melbourne: ACER.
- Baker, J. A. (1998). Are we missing the forest for the trees? Considering the social context of violence. *Journal of School Psychology, 36*(1), 29–44.
- Baldry, A. C., & Farrington, D. P. (2007). Effectiveness of programs to prevent school bullying. *Victims and Offenders, 2*, 183–204.
- Besag, V. (1989). *Bullies and victims in schools*. Milton Keynes, UK: Open University Press.
- Borman, G. D., Hewes, G. M., Overman, L. T., & Brown, S. (2003). Comprehensive school reform and achievement: A meta-analysis. *Review of Educational Research, 73*(2), 125–230.
- Bru, E., Stephens, P., & Torsheim, T. (2002). Students' perceptions of class management and reports of their own misbehavior. *Journal of School Psychology, 40*(4), 287–307.
- Brundrett, M. (2012). *Principles of school leadership*. London: Sage.
- Byrne, B. (1992). *Bullies and victims in a school setting with reference to some Dublin schools*. Dublin: University College.
- Chang, L. (2003). Variable effects of children's aggression, social withdrawal, and prosocial leadership as functions of teacher beliefs and behaviors. *Child Development, 74*(2), 535–548.
- Creemers, B. P. M., & Kyriakides, L. (2008). *The dynamics of educational effectiveness: A contribution to policy, practice and theory in contemporary schools*. London: Routledge.
- Creemers, B. P. M., & Kyriakides, L. (2012). *Improving quality in education: Dynamic approaches to school improvement*. London and New York: Routledge.
- Demetriou, D., & Kyriakides, L. (2012). The impact of school self-evaluation upon student achievement: A group randomization study. *Oxford Review of Education, 38*(2), 149–170.
- den Brok, P., Brekelmans, M., Levy, J., & Wubbels, T. (2002). Diagnosing and improving the quality of teachers' interpersonal behavior. *International Journal of Educational Management, 4*, 176–184.
- Devos, G. (1998). *Conditions and caveats for self-evaluation. The case of secondary schools*. Paper presented at the Annual Meeting of the American Educational Research Association, 13–17 April. San Diego, CA (ERIC Document Reproduction Service No. ED421493).
- Dixon, W. J. (1954). Power under normality of several non-parametric tests. *Annals of Mathematical Statistics, 25*(3), 610–614.
- Espalage, D. L., & Swearer, S. M. (2004). *Bullying in American schools: A social-ecological perspective on prevention and intervention*. Mahwah, NJ: Erlbaum.
- Fan, X., & Chen, M. (2001). Parent involvement and students academic achievement: A meta-analysis. *Educational Psychology Review, 13*(1), 1–22.
- Farrington, D. P., & Ttofi, M. M. (2011). Bullying as a predictor of offending, violence and later life outcomes. *Criminal Behaviour and Mental Health, 21*, 90–98.
- Fullan, M. (2001). *The new meaning of educational change* (3rd ed.). New York: Teachers College.
- Garcia, I. F., & Perez, G. Q. (1989). Violence, bullying and counselling in the Iberian Peninsula: Spain. In E. Roland & E. Munthe (Eds.), *Bullying: An international perspective* (pp. 41–52). London: David Fulton.
- Genta, M. L., Menesini, E., Fonzi, A., Costabile, A., & Smith, P. K. (1996). Bullies and victims in schools in southern Italy. *International Journal of Educational Research, 11*, 97–110.

- George, R., & Thomas, G. (2000). Victimization among middle and high school students: A multilevel analysis. *The High School Journal*, 84(1), 48–57.
- Good, T. L., Wiley, C. R. H., & Sabers, D. (2010). Accountability and educational reform: A critical analysis of four perspectives and considerations for enhancing reform efforts. *Educational Psychologist*, 45(2), 138–148.
- Gu, H., Lai, S-L., & Ye, R. (2011). A cross-cultural study of student problem behaviors in middle schools. *School Psychology International*, 32(1), 20–34.
- Hallinger, P., & Heck, R. H. (2011). Exploring the journey of school improvement: Classifying and analyzing patterns of change in school improvement processes and learning outcomes. *School Effectiveness and School Improvement*, 22(1), 1–27.
- Hirschstein, M. K., Edstrom, L. V., Frey, K. S., Snell, J. L., & Mackenzie, E. P. (2007). Walking the talk in bullying prevention: Teacher implementation variables related to initial impact of the steps to respect program. *School Psychology Review*, 36(1), 3–21.
- Hu, L., & Bentler, P. M. (1999). Cut-off criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6, 1–55.
- Kallestad, J. H., & Olweus, D. (2003). Predicting teachers' and schools' implementation of the Olweus Bullying Prevention Program: A multilevel study. *Prevention and Treatment*, 6(1), Article 21.
- Keeves, J. P., & Alagumalai, S. (1999). New approaches to measurement. In G. Masters N. & J. Keeves P. (Eds.), *Advances in measurement in educational research and assessment* (pp. 23–42). Oxford: Pergamon.
- Keller, H. R., & Tapasak, R. C. (1997). Classroom management. In P. Goldstein A. & J. Conoley C. (Eds.), *School violence intervention: A practical handbook* (pp. 107–126). New York: The Guilford Press.
- Kline, R. H. (1998). *Principles and practice of structural equation modeling*. London: The Guilford Press.
- Kochenderfer, B. J., & Ladd, G. W. (1996). Peer victimization: Manifestations and relations to school adjustment in kindergarten. *Journal of School Psychology*, 34(3), 267–283.
- Kyriakides, L. (2005). Evaluating school policy on parents working with their children in class. *The Journal of Educational Research*, 98(5), 281–298.
- Kyriakides, L. (2008). Testing the validity of the comprehensive model of educational effectiveness: a step towards the development of a dynamic model of effectiveness. *School Effectiveness and School Improvement*, 19(4), 429–446.
- Kyriakides, L., Bosker, R., Muijs, D., Papadatos, Y., & Van Petegem, P. (2011). *Designing evidence-based strategies and actions to face bullying by considering socio-ethnic diversities in school populations and evaluating their effects* (European Commission's Daphne III Programme JLS/DAP/2007-1/226). Nicosia, Cyprus: University of Cyprus, Retrieved from <http://www.ucy.ac.cy/data/jls/publications/FINAL%20REPORT.pdf>
- Kyriakides, L., & Creemers, B. P. M. (in press). Characteristics of effective schools in facing and reducing bullying. *School Psychology International*.
- Kyriakides, L., Creemers, B. P. M., Antoniou, P., & Demetriou, D. (2010). A synthesis of studies for school factors: Implications for theory and research. *British Educational Research Journal*, 36(5), 807–830.
- Kyriakides, L., Kaloyirou, C., & Lindsay, G. (2006). An analysis of the revised Olweus Bully/Victim questionnaire for students using the Rasch model. *British Journal of Educational Psychology*, 76(4), 781–801.
- Kyriakides, L., & Tsangaridou, N. (2008). Towards the development of generic and differentiated models of educational effectiveness: A study on school and teacher effectiveness in physical education. *British Educational Research Journal*, 34(6), 807–838.
- Lane, K. L., Kalberg, J. R., & Menzies, H. M. (2009). *Developing schoolwide programs to prevent and manage problem behaviors. A step-by-step approach*. New York: The Guilford Press.

- Ma, X. (2002). Bullying in middle school: Individual and school characteristics of victims and offenders. *School Effectiveness and School Improvement*, 13, 63–89.
- Mellor, A. (1990). *Bullying in Scottish secondary schools*. Edinburgh, UK: Scottish Council for Research in Education.
- Modin, B., & Ostberg, V. (2009). School climate and psychosomatic health: a multilevel analysis. *School Effectiveness and School Improvement*, 20(4), 433–455.
- Morita, Y. (1985). *Sociological study on the structure of bullying group*. Osaka, Japan: Osaka City University Department of Sociology.
- Muijs, D., & Reynolds, D. (2001). *Effective teaching: Evidence and practice*. London: Sage.
- Murray-Harvey, R., & Slee, P. T. (2010). School and home relationships and their impact on school bullying. *School Psychology International*, 31(3), 271–295.
- Muthén, L. K., & Muthén, B. O. (1999). *Mplus user's guide*. Los Angeles: Muthén & Muthén.
- Muthén, L. K., & Muthén, B. O. (2001). *Mplus: statistical analysis with latent variables: user's guide* (2nd ed.). Los Angeles: Muthén & Muthén.
- Nakou, I. (2000). Elementary school teachers' representations regarding school problem behaviour: Problem children in talk. *Educational and Child Psychology*, 17, 91–106.
- Olweus, D. (1978). *Aggression in the schools: Bullies and whipping boys*. Washington, DC: Hemisphere.
- Olweus, D. (1993). *Bullying at school. What we know and what we can do?* Oxford: Blackwell.
- Olweus, D. (1997). Bully/victim problems in school: Facts and intervention. *European Journal of Psychology of Education*, 12, 495–510.
- Opdenakker, M. C., & Van Damme, J. (2000). Effects of schools, teaching staff and classes on achievement and well-being in secondary education: Similarities and differences between school outcomes. *School Effectiveness and School Improvement*, 11(2), 65–196.
- Parada, R. H., Craven, R. G., & Marsh, H. W. (2008). The beyond bullying secondary program: An innovative program empowering teachers to counteract bullying in schools. In H. Marsh W., R. Craven G., & D. McInerney M. (Eds.), *Self-Processes, learning, and enabling human potential: Dynamic new approaches* (Vol. 3, pp. 373–426). Charlotte, NC: Information Age Publishing.
- Rigby, K. (2002). *New perspectives on bullying*. London: Jessica Kingsley Publishers Ltd.
- Rigby, K., Smith, P. K., & Pepler, D. (2005). *Bullying in schools: How successful can interventions be?* Cambridge: Cambridge University Press.
- Rutter, M., Giller, H., & Hagell, A. (1998). *Antisocial behavior by young people*. Cambridge: Cambridge University Press.
- Scheerens, J., & Bosker, R (1997). *The foundations of educational effectiveness*. Oxford: Pergamon.
- Scheerens, J., Seidel, T., Witziers, B., Hendriks, M., & Doornekamp, G. (2005). *Positioning and validating the supervision framework*. Enschede/Kiel: University of Twente, Department of Educational Organisational and Management.
- Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Boston: Houghton Mifflin.
- Sharp, S., & Smith, P. (1994). *Tackling bullying in your school: A practical handbook for teachers*. London: Routledge.
- Siegel, S., & Castellan, N. J. (1988). *Non-Parametric statistics: For the behavioural sciences* (2nd ed.). New York: McGraw-Hill.
- Slee, P. T. (1994). Situational and interpersonal correlates of anxiety associated with peer victimization. *Child Psychiatry and Human Development*, 25, 97–107.
- Smith, P. K., & Brain, P. (2000). Bullying in schools: Lessons from two decades of research. *Aggressive Behavior*, 26(1), 1–9.
- Smith, J. D., Schneider, B., Smith, P. K., & Ananiadou, K. (2004). The effectiveness of whole-school anti-bullying programs: A synthesis of evaluation research. *School Psychology Review*, 33, 548–561.

- Snijders, T., & Bosker, R. (1999). *Multilevel analysis: An introduction to basic and advanced multi-level modeling*. London: Sage.
- Stevens, V., Van Oost, P., & de Bourdeaudhuij, I. (2001). Implementation process of the Flemish anti-bullying intervention and relation with program effectiveness. *Journal of School Psychology, 39*, 303–317.
- Swearer, S. M., Espelage, D. L., & Napolitano, S. A. (2009). *Bullying prevention and intervention: Realistic strategies for schools*. New York: The Guilford Press.
- Teddlie, C., & Reynolds, D. (2000). *The international handbook of school effectiveness research*. London: Falmer Press.
- Torres, R. T., & Preskill, H. (2001). Evaluation and organizational learning: Past, present, and future. *American Journal of Evaluation, 22*(3), 387–395.
- Ttofi, M. M., & Farrington, D. P. (2009). What works in preventing bullying? Effective elements of anti-bullying programmes. *Journal of Aggression, Conflict and Peace Research, 1*(1), 13–24.
- Waterman, J., & Walker, E. (2009). *Helping at-risk students. A group counselling approach for grades 6-9*. New York: The Guilford Press.
- Weishew, N. L., & Peng, S. S. (1993). Variables predicting students' problem behaviours. *Journal of Educational Research, 87*(1), 5–17.
- West, P., Sweeting, H., & Leyland, A. (2004). School effects on pupils' health behaviours: Evidence in support of the health promoting school. *Research Papers in Education, 19*(3), 261–291.
- Wilson, S. J., Lipsey, M. W., & Derzon, J. H. (2003). The effects of school-based intervention programs on aggressive behavior: A meta-analysis. *Journal of Consulting and Clinical Psychology, 71*, 136–149.
- Wright, B. D. (1985). Additivity in psychological measurement. In E. Roskam E. (Ed.), *Measurement and personality assessment* (pp. 101–112). Amsterdam: Elsevier Science Publishers BV.

## Appendix A

This appendix refers briefly to the main actions taken by one of the experimental schools which attempted to improve its policy on student behavior outside classroom. These actions are classified into the following four categories: (1) student behavior during the break, (2) student behavior before the lesson starts (early in the morning), (3) student behavior after school hours/after lessons finish, and (4) establishment of a behavior code.

### Student behavior during the break

During a staff meeting, it was decided that the school should develop a policy concerning *effective supervision of their students during the break*. Thus, the school's management team made a supervision plan. A list of the teachers responsible for supervision was determined and the role of each person and the places each teacher was expected to supervise were also mentioned. In regard to the role of teachers during the break, it was decided that they should observe student behavior in order to detect any mental or physical health symptoms or any systematic changes in their mood. They should also conduct informal interviews with students where questions could be open-ended and asked in a way to normalize the experiences and to create conditions under which students feel free to openly express their feelings. Teachers were also asked to be visible and vigilant in the common areas of the school.

Moreover, teachers were asked to search for any *isolated students who may be victims of bullying*. It was explained that in such case the teacher should discuss with the isolated child and provide support. After such contact and communication, low-profile students (who may experience bullying) may feel more confident in reporting bullying incidents. It was, however, stressed that conclusions should not be arbitrary, but should be drawn after discussion and reception of sufficient and appropriate information. Supervisors should also try to support peer bystanders and encourage them to speak up in



safe ways about bullying to tell the staff what they see and hear, and to be friends with isolated peers. Teachers were, finally, asked to *thank and protect students who report aggressive behavior* towards themselves or toward others. It was stressed that *confidentiality* must be ensured and a nonthreatening way for students to report bullying of themselves or classmates must be established.

During break time, playground activities were also organized and directions were given to students (i.e., include others in their game, be active, follow the rules, use equipment appropriately, return equipment when they are done, line up when the bell rings, respect other people's personal space). In addition, the school board decided to offer *music during the break* in order to calm students' aggressive emotions.

Efforts to create a more *attractive natural environment* (i.e., benches, tables) were also undertaken. By creating a more beautiful natural environment, some isolated spots were utilized and therefore the places of the school became safer and more secure for the students to play and spend their time outside the classroom in a positive way.

Teachers also decided to *systematically reward good behavior* not only in the classroom but also outside (i.e., during break time, before lessons start, and after the end of the lessons) and set up a *motivation system* to improve the social environment of the school by taking actions to emphasize the maintenance of the behavior code and the promotion of appropriate and positive behaviors outside the classroom. More specifically, it was decided that "tickets" could be earned by those students who: (1) interact and approach isolated students, (2) show respect for peers and teachers, and (3) behave responsibly. It was also stressed that teachers should *use frequent descriptive praise for positive behavior*, especially when an aggressive student starts to act responsibly. Moreover, it was agreed to give descriptive feedback (e.g., "I notice that you have been playing without fighting") than trait-based praise ("You're so kind") or I-messages ("I'm so happy you are acting better"). Furthermore, a praise card was sent home. Parents were informed about this policy and were encouraged to provide rewards for their children when they saw that their child had received a praise card.

Two *student-made videos* were also developed by the school's video team (consisting of eight grade-6 students and a teacher) which were expected to teach specific social skills and were used as a booster by showing positive attitudes and behavior outside the classroom (i.e., on the bus, in the canteen, in the assembly, during a school visit).

### **Student behavior before lessons start (early in the morning)**

It was arranged for a teacher to be at the school's entrance every day, to welcome the students and their parents. In order to avoid disciplinary problems before the bell rings, the students were expected to go to class as soon as they arrive at school. In addition, a document was sent home stating to the parents the exact time that all the students should be at school in order to avoid disciplinary problems and misbehavior after the bell rings. Moreover, it was explained to parents that the school asks for punctuality in students' arrival and departure from school in order to eliminate occurrences of misbehavior and bullying incidents. Special attention was given to providing instructions to children about their arrival at school. More specifically, the school defined the following expectations concerning students' arrival, which were announced to all students: (1) walk, do not run; (2) enter the school quickly and quietly; (3) minimize chatting, (4) arrive at class on time, (5) put your bag in classroom and go to the playground, (6) respect materials (e.g., posters in the hallways), (7) avoid interaction with persons that you do not know outside the school, and (8) do not bring valuable items to school.

### **Student behavior after school hours/after lessons finish**

It was made clear to the parents that they had to arrange to take their children home from school as soon as lessons finish. For the children who were supervised in school after school hours, a professional person (i.e., a qualified teacher) who was aware of the school's requirements was appointed.



Special attention was given to providing children with instructions about their exit from the classroom and school. More specifically, the school defined the following expectations concerning students' exit from school, which were announced to all students: (1) leave the school quickly and quietly; (2) minimize chatting; (3) remember to take all your belongings from class; and (4) when you are outside the school (waiting for your parents) avoid interaction with persons who you do not know.

### **Behavior code determined by the school (with cooperation of students, teachers and parents) concerning student behavior outside the classroom**

For the development of the behavior code, it was considered useful to emphasize specific aspects that need to be taken seriously into account and could reinforce positive, acceptable, and respectful behavior from students. In particular, the following aspects were addressed: (1) significance of weekly meetings with the students, (2) expectations from victims, (3) responsibilities of bystanders, (4) queuing in the canteen, (5) students' arrival at and departure from the school, and (6) school assembly.

In order to ensure that positive behavior will be sustainable, *weekly meetings* to communicate with students were arranged. Through these meetings, teachers had the opportunity to increase students' motivation to follow the rules of the behavior code. Moreover, in the behavior code, the following *expectations of victims* (what victims of bullying should do) were stated clearly: (1) tell a teacher; (2) report to the principal; (3) tell parents; (4) do not suffer in silence; (5) seek help; (6) act decisively and with confidence; and (7) draw, write or discuss your feelings. Beyond the expectations of victims, the following *responsibilities of pupil bystanders* were also stated in the behavior code: (1) report to an adult; (2) include students who are easily left out—invite the victim to join you and your friends; (3) when you know that somebody is being bullied, tell an adult at school and an adult at home, and (4) do not gossip about what is happening.

In regard to *queuing in the canteen*, the following specific positive behaviors for students to follow were defined: (1) use a quiet voice; (2) keep your hands to yourselves; (3) use manners; (4) make choices quickly; (5) stay in line and wait patiently; (6) follow adults' requests; and (7) clean up any trash. It is also important to note that in order to facilitate the process in the canteen, separate queues for younger (i.e., grades 1, 2, and 3) and older students (grades 4, 5, and 6) were used.

Moreover, special attention was given to the behavior of students on the school bus. Specific expectations concerning students' behavior code on the bus were announced to all students: (1) be ready when the bus arrives; (2) use kind words towards the bus driver and other students; (3) follow the driver's rules; (4) remain in your seat after you enter the bus; (5) speak in a quiet voice; (6) carry on all personal belongings; and (6) share seating.

Finally, the school management team and the project coordinator were responsible for collecting information concerning the implementation of the actions mentioned above and providing support to teachers and students who may need help in order to implement the policy more effectively. A data bank indicating the impact of these actions was also developed. The coordinator analyzed the data from time to time and informed teachers during staff meetings about the gradual impact of their policy on improving the SLE and reducing bullying. If needed, teachers had the chance to develop the school policy and actions further.