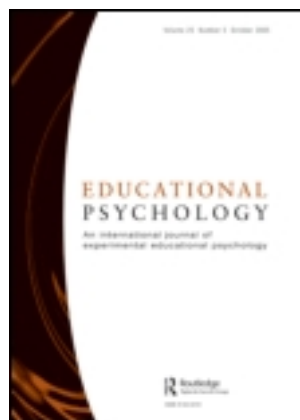


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## Educational Psychology: An International Journal of Experimental Educational Psychology

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/cedp20>

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Version of record first published: 10 May 2012.

To cite this article: Solveig Holen, Trine Waaktaar, Arne Lervåg & Mette Ystgaard (2012): The effectiveness of a universal school-based programme on coping and mental health: a randomised, controlled study of Zippy's Friends, *Educational Psychology: An International Journal of Experimental Educational Psychology*, 32:5, 657-677

To link to this article: <http://dx.doi.org/10.1080/01443410.2012.686152>

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## The effectiveness of a universal school-based programme on coping and mental health: a randomised, controlled study of Zippy's Friends

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(Received 18 November 2011; final version received 15 April 2012)

The purpose of this study was to evaluate Zippy's Friends, a universal school programme that aims at strengthening children's coping skills. The sample consisted of 1483 children (aged 7–8 years) from 91 second-grade classes in 35 schools. The schools were matched and randomly assigned to intervention or control conditions. Coping was assessed by the Kidcope checklist for children and an adapted version for parents. Parents and teachers reported mental health outcomes using the Strengths and Difficulties Questionnaire. Controlling for the hierarchical structure of the data, latent variable regression analysis indicated that the programme had a significant positive effect on coping and on the impact of mental health difficulties in daily life. Subgroup analyses suggested that coping was improved in girls and children from the low socio-economic subgroup, whereas the impact of mental health difficulties was reduced in boys.

**Keywords:** schoolchildren; intervention; promotion; coping; mental health

Over the past few years, studies of universal approaches to school-based prevention and promotion programmes have grown substantially. A large number of universal school programmes have been introduced, most notably to prevent behavioural difficulties and bullying in young children (Cooke et al., 2007; Jenson & Dieterich, 2007; Olweus & Limber, 2010; Sapouna et al., 2010). There has also been an increase in school programmes focusing on social skills and mental health promotion (Bierman et al., 2008; Gillham et al., 2007; Humphrey et al., 2010; Mishara & Ystgaard, 2006). Reviews and meta-analyses indicate that both universal and targeted prevention programmes can substantially reduce the rate of problem behaviours and symptoms, and they can build protective factors that further reduce risk in child populations (Adi, Killoran, Janmohamed, & Stewart-Brown, 2007; Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011; Greenberg, 2010; Kraag, Zeegers, Kok, Hosman, & Abu-Saad, 2006; Wells, Barlow, & Stewart-Brown, 2003).

Reviews of universal interventions to promote mental health indicate that they are effective (Adi et al., 2007; Durlak et al., 2011; Kraag et al., 2006; Wells et al., 2003). A recent meta-analysis of universal school-based programmes intended to

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promote students' social and emotional development through social and emotional learning documented significant positive effects on targeted social-emotional competencies and attitudes about self, others and school, as well as increased prosocial behaviours (Durlak et al., 2011). There is also some evidence that stress management and coping programmes are effective (Adi et al., 2007; Kraag et al., 2006). A meta-analysis of studies including children and young adolescents (ages 9–14 years) concluded tentatively that school programmes targeting stress management and coping are effective in reducing stress symptoms and enhancing coping skills (Kraag et al., 2006). However, further research accounting for methodological shortcomings was recommended.

Previous studies typically include older children, and have often used non-random assignment to groups and small sample sizes (Adi et al., 2007; Kraag et al., 2006). Factors such as age, sex, psychosocial risk and ethnic and social group may influence the outcome of an intervention, but samples are too small to conduct subgroup analyses (Adi et al., 2007; Durlak et al., 2011). Furthermore, because relatively few studies have checked to see whether programmes were conducted as planned, there is doubt about whether it was the targeted programme that actually was evaluated (Durlak, 2010). Studies in schools also include nested group designs, in which interventions occur in classrooms or throughout the school. In such cases, the individual student data are not independent, but most authors fail to use proper statistical procedures to account for this clustering of data (Durlak et al., 2011; Wells et al., 2003).

### **The Zippy's Friends programme**

Zippy's Friends is a universal school-based programme targeting children between 6 and 8 years of age. The main objective of the programme is to prevent psychological problems by increasing children's coping repertoire and giving them various ways of coping with problems (Mishara & Ystgaard, 2006). The programme builds on theory and empirical findings on the relation between negative life events, coping and mental health (Compas, 1987; Lazarus & Folkman, 1984). Previous research indicates that a repertoire of coping strategies can help young children mitigate the effects of stressors on the development of psychological problems (Valiente, Lemery-Chalfant, & Swanson, 2009). Lazarus and Folkman (1984) distinguish between two main types of coping strategies: activity-focused and emotional strategies. Emotional coping includes everything we do to regulate the negative emotions triggered by an event, such as playing music, taking a walk or crying. Action-focused coping refers to everything we do to change the situation that frustrates us or makes us unhappy.

Zippy's Friends was originally developed by international researchers and initiated by the organisation Befrienders International, a global suicide prevention agency. The programme is distributed internationally through the non-profit organisation Partnership for Children ([www.partnershipforchildren.org.uk](http://www.partnershipforchildren.org.uk)), which forms a partnership with a local organisation in each country to deliver and manage the programme. It is currently implemented in 19 countries all over the world.

Zippy's Friends is based on six stories about three cartoon characters, their families and friends, and the imaginary stick insect Zippy. Over the course of 24 weekly lessons, children explore themes related to emotions, communication, relations and conflict resolution through the many day-to-day problems, sorrows and joys Zippy

and his friends experience (Mishara & Ystgaard, 2006). Through tasks and discussions within a manualised structured programme, the children are stimulated to interact and take part in dialogues in class, and to share experiences and perceptions. The programme is designed with stepwise progression from simple to more complex elements. The coping aspect recurs in various ways in all the lessons. Activation and the exploration of both emotional and action-oriented coping alternatives are being emphasised. The teacher's challenge is thus to maintain the programme structure and aims as well as guiding the class through structured learning tasks. Learning is transferred across different settings through the repetition of learning experiences in continuously new situations, during project classes and in the day-to-day affairs of school. The teaching material consists of: (1) six stories about Zippy and his friends; (2) large colour posters illustrating the stories; (3) a detailed instruction manual for the teachers. Each of the six stories focuses on a main topic: emotions, communication, friendship, conflicts and conflict resolution, loss and change and finally summary lessons about coping, which repeats and integrates everything learnt up to that point. The children work on these topics by drawing, role playing, performing exercises, play and dialogue.

The current version of Zippy's Friends was first tested in Denmark and Lithuania. Children in the intervention group improved their social skills and showed significantly better coping than children in the control group (Mishara & Ystgaard, 2006). Another study indicated that programme participants handled the transition from kindergarten to first grade better than the control children (Monkeviciene, Mishara, & Dufour, 2006). However, these evaluations were based on small samples and quasi-experimental research designs, and they failed to account for the possible hierarchical structure of the data.

### **Purpose of the study**

To account for shortcomings in previous studies, the current study used a randomised design, controlling for the hierarchical structure of the data, to examine the hypothesis that participating in the Zippy's Friends programme would improve children's coping repertoire and prevent mental health problems. We also investigated whether the effects varied by gender or the socio-economic background of the family.

### **Method**

#### ***Settings and participants***

The study was carried out in whole classes at the second-grade level of primary school in the school-year 2007–2008. Based on the Norwegian Directorate of Health's target area for disseminating the Zippy programme in 2007, all primary schools from three regions in Norway (Trondheim, Bodø and Østfold) were invited to participate in the study. Thirty-five schools, representing both rural and urban areas, agreed to participate. All second-grade classes in the participating schools took part in the study. Since the cooperation between classes on the same level is extensive in Norwegian school, randomisation had to be performed on school-level. Furthermore, since the number of schools participating in the study was only 35, randomisation without matching could result in unequal groups. Thus, the schools were matched in pairs using available variables we considered important for the

outcome: school socio-economic profile (provided by the local authorities), percentage of special teaching and ethnic minority backgrounds (provided by Norwegian School Statistics). The schools from each pair were randomly assigned to the control or intervention group. The control schools were given no directions from the project and thus performed ‘business as usual’. See Figure 1 for information about selection and attrition of participants.

The mean age in the sample at T1 was 7.3 years ( $SD=.32$ ). Almost half (49.3%) of the sample was girls, and 75.9% of the children lived with both their mother and father. About 7.5% had a mother or father who was not born in Norway, and about 3% of those parents were from African or Asian countries. In 85.7% of the families, at least one of the parents had completed high school and 61.6% had received higher education. Of the total population of adults aged

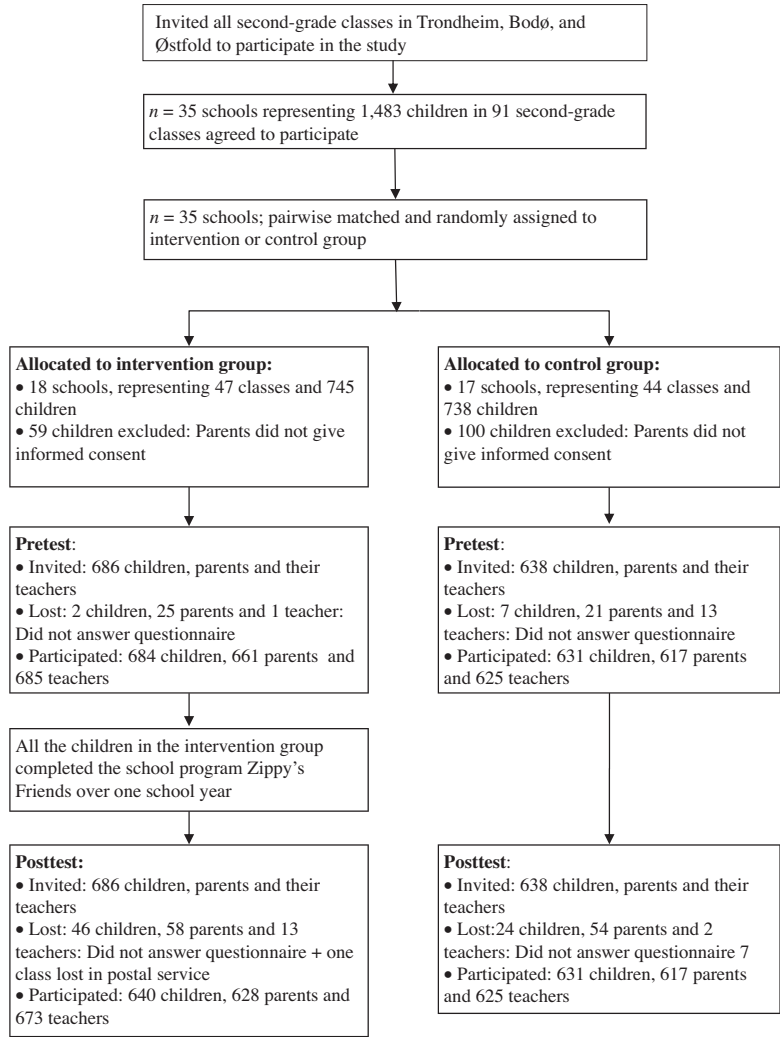


Figure 1. Flowchart showing selection and attrition of participants in accordance with the Consort guidelines.

25–49 years in Norway, about 74% had completed high school and about 35% had completed higher education according to Statistics Norway, 2007. The level of education in our study sample was based on the highest education in the household. Thus, the level of education seems representative for Norway, with the exception of a slightly higher proportion of families with higher education in our sample.

### *Procedures*

The teachers collected data for their classes, using similar measures at T1 and T2. Plans, questionnaires, information letters to parents and consent forms were circulated in advance of programme implementation. The teachers distributed the parents' information letter, collected the consent forms and subsequently collected the questionnaires from the parents whose children participated in the study. All children in each class received the programme but only data from those whose parents had consented were included in the effectiveness study.

Because of the additional work for teachers, schools were given funds to pay for a relief teacher. The study was approved by the Norwegian Data Inspectorate and the Regional Committee for Medical Research Ethics of Eastern and Southern Norway.

### *Intervention*

The non-profit organisation Voksne for Barn ('Adults for children'; [www.vfb.no](http://www.vfb.no)) conducts the Zippy's Friends programme in Norway. The implementation of the programme was funded by the Norwegian Directorate of Health. Before the programme started, teachers and the staff in each school's health and psychology services received two days of training. Participants learned about the programme's aims and principles and received training in how to teach their classes. Over the course of 24 weekly lessons, the children were stimulated to initiate their own activities, interactions and dialogue, and to share perceptions and experiences as described at pages 4–6. The programme was implemented by the teachers and was to have a central place in the children's lives over an extended period of time (minimum eight months). Three counselling sessions lasting one day each were scheduled for the teachers in the course of the programme. The school psychology service and the school health service also joined these meetings when possible.

### *Measures*

#### *Demographics*

Parents provided information about their education level and their child's sex and ethnicity. Because of the relatively low levels of social inequality in Norway, Statistics Norway recommended that the household's highest education level be used as a social and economic status (SES) variable. We coded this variable dichotomously, with 0 representing education up to and including high school, and 1 representing higher education levels.

#### *Coping*

Spirito, Stark, and Williams (1988) developed the Kidcope questionnaire based on stress-coping theory for adults (Lazarus & Folkman, 1984). They prepared two



slightly different checklists to measure the same 10 coping strategies (distraction, social withdrawal, cognitive restructuring, self-criticism, blaming others, problem solving, emotional expression, wishful thinking, social support and resignation) in younger children and adolescents. The younger children's version (7–12 years) including 15 items was used by the children, whereas an adapted adolescent version including 12 items was used by their parents to report their child's coping. To examine test–retest reliability, Spirito and colleagues examined six normal samples (aged 10–18) using an optional stressor chosen by the child, and found test–retest reliabilities over a three- to seven-day period ranging from .41 to .83, and lower reliabilities over a 10-week period ( $r = .15-.43$ ). Because no factor structure was derived, internal consistency measures were not included.

Over the years, there have been several attempts to analyse Kidcope data using higher order factor structures, but the number of resulting categories varies depending both on the age group and on the stressful situation used to indicate response (Spirito, 1996). Spirito recommended an exploratory approach to determine the number of factors that best fit the data in each study.

We used the Norwegian (Bokmal) version of Kidcope, which was translated and back-translated by the Norwegian Institute of Public Health. This version was intended to be anchored to an optional stressor chosen by the researcher or the participant. We chose to administer the coping items to the same specific peer problem situation for both children and parents: What are you (or your child) likely to do if your (his/her) best friend does not want to play with you (him/her) during recess or lunch break, and you (he/she) are socially excluded in the playground? The children's answers were dichotomous, indicating whether they would use each coping strategy, whereas the parents had four response alternatives: *Not at all*, *Sometimes*, *A lot of the time*, *Almost all the time*. Because the fourth alternative was scarcely used (only four occurrences of a total of 15,600 responses), we recoded these occurrences to alternative three, *A lot of the time*.

Many of the participating children were not yet able to read. Therefore, the children's questionnaires contained only pictures, signs and numbers. Each teacher received a manual with explanations, examples and statements. After explaining the procedure to the children and giving them examples, the teacher read the statements aloud to the class. After each statement, the children were asked to indicate whether this was correct for him or her by ticking a 'thumbs-up' or 'thumbs-down' sign. The teacher explained orally to the children what the 'thumbs-up' and 'thumbs-down' signs meant. In addition, an assistant helped children who had any problems with the procedure. As far as we know, this format has not been tested in previous studies on Kidcope. It was adapted from a German questionnaire measuring social and emotional school experiences for 6- to 7-years-old children (Rauer & Schuck, 2003). We piloted the format in a second-grade class prior to the study to have an indication of whether the children understood the administration and were able to answer the questionnaire.

Children who were not participating in the study were given other tasks during data collection.

### *Mental health*

Mental health was assessed using the extended Norwegian version ([www.sdqinfo.com](http://www.sdqinfo.com)) of the Strengths and Difficulties Questionnaire (SDQ), parent and teacher



form (Goodman, 1997). The extended version is a multidimensional measure that covers five dimensions of mental health in children aged 3–16 years, as well as an impact score (Goodman, 1999). The SDQ is widely used as a brief psychiatric screening instrument for children and adolescents (Goodman, Ford, Simmons, Gatward, & Meltzer, 2003; Obel et al., 2004). It consists of 25 items representing five subscales: Emotional Symptoms, Conduct Problems, Hyperactivity/Inattention, Peer Problems and Prosocial Behaviour. The response scale has three alternatives: *Not True*, *Somewhat True* and *Certainly True*. The impact supplement asks the respondent if the child has had any problems over the last year, and if so, it enquires further about chronicity, distress, social impairment and burden to others. Reports indicate that the reliability of the English version has been generally satisfactory, when judged by internal consistency (mean Cronbach's: .73), cross-informant correlation (mean: .34) and retest stability after 4–6 months (mean: .62; [Goodman, 2001]).

### *Programme implementation*

The teachers in the intervention group filled out a short computer-based questionnaire after each lesson that allowed them to comment on the lesson noting any changes they may have made relative to the instructions in the programme manual. Furthermore, at T2, the teachers' questionnaire included questions about how many lessons they conducted, possible training prior to the programme and whether they received any guidance during implementation. They also indicated how satisfied they were with the programme and whether they believed the programme's intentions were fulfilled.

### *Analyses*

All analyses were performed with Mplus, version 6.11, which is a statistical tool for structural equation modelling (SEM) (Muthén & Muthén, 2010). Since the latent variable mean scores for categorical data in Mplus are standardised to zero, descriptive values (i.e. mean and standard deviation) were obtained from analysis in SPSS, version 18.

The robust weighted least squares (WLSMV) estimator with Delta parameterisation, which is recommended for analysis of skewed categorical data, was applied (Muthén, 1984). Missing data were identified and estimated using limited-information weighted least squares estimation, which is the default method in Mplus when using WLSMV estimators (Muthén & Muthén, 1998–2010).

We accounted for the hierarchical structure of the data by using complex sample analyses with two levels, individuals and classes. All current variables were on an individual level, including children, parents and teachers as responders. In order to establish the hierarchy in our data, we estimated the intraclass correlation coefficients (ICC) and design effects (DEFF) for classes and schools at pre-test, comprising each informant separately. Results from analyses indicated no need to control for the third level (school), as both the ICC and the DEFF for the scores at school level were below recommended standards ( $ICC < .05$ ; Muthén & Satorra, 1995;  $DEFF < 2.00$ ; Peugh, 2010).

We assessed model fit using the comparative fit index (CFI), the Tucker–Lewis index (TLI) and the root mean square error of approximation (RMSEA). Cut-off

values close to .95 for CFI and TLI, and RMSEA close to .06 are interpreted as indications of good fit (Browne & Cudeck, 1993). More specifically, they suggest that RMSEA values below .05 reflect a close fit, while values between .05 and .08 reflect a reasonable fit to the data.

To see whether the latent constructs could be interpreted in the same way across both time and groups, we tested for strong measurement invariance (invariance of both factor loadings and thresholds). Furthermore, as the sample size was large, we followed Cheung and Rensvold (2002) and used  $CFI \leq .01$  as an indication of invariance.

Effect sizes are reported using standardised (STD) values, where the latent variables are standardised while the original metric is retained in the observed (control/intervention) variables (Brown, 2006). Based on this understanding, STD values can be interpreted similarly to Cohen's *d* (Cohen, 1988). An effect size around 0.2 is traditionally considered 'small', 0.5 'medium' and 0.8 'large'. The standardised beta's represent the stability of the measurement.

To investigate possible effects of the school programme, we first performed factor analysis on each scale using two different approaches. Based on previous investigations of the Kidcope scale (Holen, Lervåg, Waaktaar, & Ystgaard, 2012) and because this scale seems to lack a clear theoretical factor structure (Spirito, 1996), we chose exploratory factor analysis (EFA) as the analytic tool to examine the children's and parents' data.

The SDQ questionnaires were analysed using a confirmatory factor analysis (CFA) approach, to confirm the adequacy of the five-factor structure for the present sample (Goodman, 2001; Sanne, Torsheim, Heiervang, & Stormark, 2009).

After having established measurement invariance over time, we examined the effects on coping and mental health by one regression model for each scale and informant, combining similar factor structures from T1 and T2 using control/intervention as a covariate. The effect on coping (Kidcope scale) was analysed using latent variable regression models including exploratory structural equation model (ESEM) analysis, children and parents form (see Figure 2; Marsh et al., 2010). In addition to freely allowing cross-loadings between factors and observed variables, the ESEM procedure gives access to typical SEM parameters, such as standard errors, goodness of fit statistics and other statistical advances normally associated with CFA analysis (Asparouhov & Muthén, 2009).

The effect on mental health (the SDQ scale) was examined through two latent factor regression models using the CFA approach. One model included the parents' data whereas the other included the teachers' data (see Figure 3).

The impact score was a part of the SDQ scale, and was a continuous measure based on whether the respondent thought the child had any problem, and if so, ratings of the chronicity, distress, social impairment and burden to others were included. Possible effects on impact scores were analysed in separate models for parents and teachers.

Through these analyses, we were able to investigate whether the school-based programme Zippy's Friends had any effects on coping or mental health outcomes as reported by multiple informants. Furthermore, we investigated subgroup effects across two different groups: Sex (*male/female*) and SES (*high/low*).

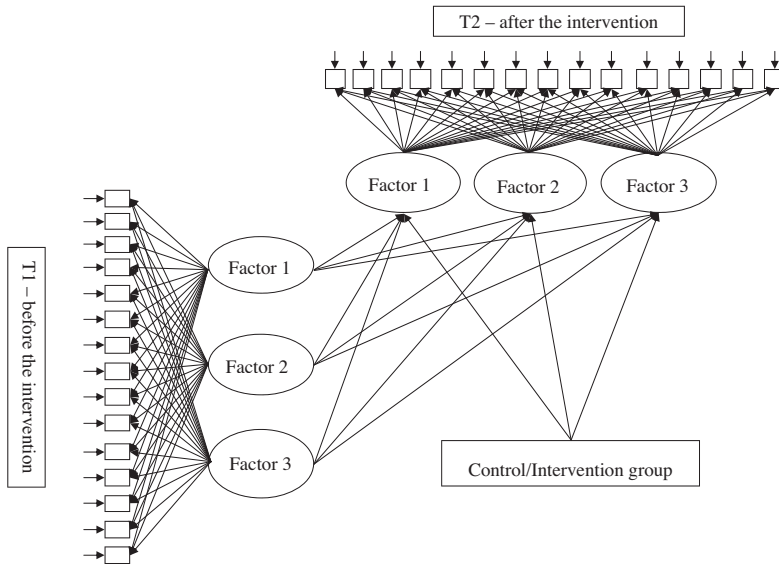


Figure 2. Exploratory latent variable (ESEM) regression models, Kidcope (parent model and child model). Note: Due to the complexity of the models, only factor loadings and regressions (but no correlations) are indicated. See Tables 2, 3 and 5 for numerical values.

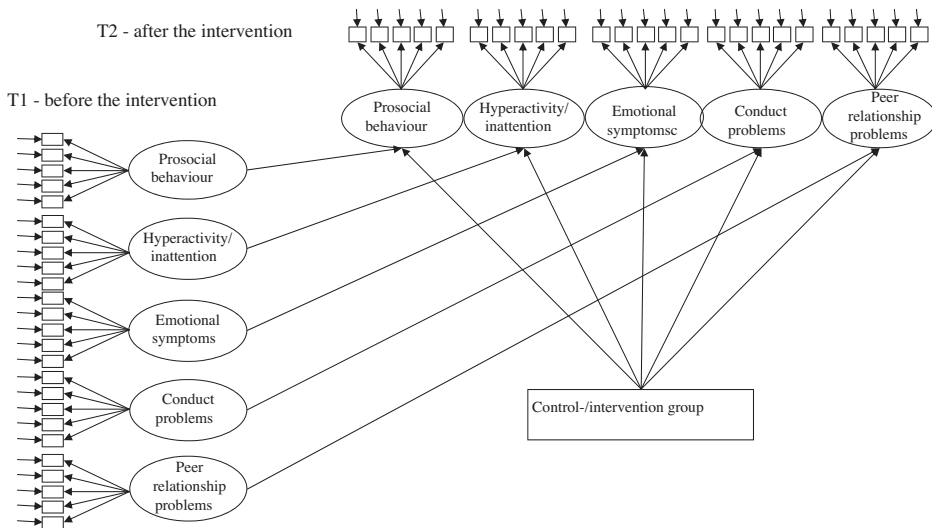


Figure 3. Confirmatory latent variable (CFA) regression models, SDQ (parent model and teacher model). Note: Due to the complexity of the models, only factor loadings and regressions (but no correlations) are indicated. See Appendix A and B and Table 5 for numerical values.

## Results

### Implementation

The intervention was conducted mainly as planned. Nearly 85% of the teachers reported that they completed all 24 lessons. Most of those who did not complete all

sessions only dropped one or two. Teachers of 4.3% had missing data. Only 13.4% of teachers reported minor deviations from the programme manual (e.g. finished the lesson earlier or used current examples instead of manual). The majority of teachers (93.5%) completed the necessary training before they started the Zippy’s Friends programme. Around half of the teachers (45.7%) received support during implementation. As assessed on a five-point likert scale (1=not at all, 5=in high degree), teachers reported high satisfaction (median=4) with the programme, and they were confident that the programme fulfilled its objective (median=4).

**Factorial structures**

First, we established the most suitable number of factors for Kidcope using EFA allowing for one to five factors (see Table 1). By examining the eigenvalues, model-fit parsimony and interpreting the factors, we chose a three-factor solution for both the children’s and the parents’ models.

Further, using longitudinal ESEM, we established that the three-factor solution was invariant over time ( $\Delta\text{CFI} = -.008$ ). The overall model fit was acceptable ( $\text{RMSEA} = .014$ ,  $\text{CFI} = .941$ ,  $\text{TLI} = .929$ ). Based on the salient item loadings from the children’s form, we labelled these factors Active/Emotional Regulation (Factor 1), Withdrawal (Factor 2) and Oppositional (Factor 3). Variable details are provided in Table 2.

The parent’s coping assessment was analysed using the similar approach. The overall model fit for the longitudinal, three-factor ESEM model was good ( $\text{RMSEA} = .022$ ,  $\text{CFI} = .965$ ,  $\text{TLI} = .955$ ). Furthermore, measurement invariance over time was established ( $\Delta\text{CFI} = -.005$ ). The items included in the latent variables provided by the parents’ model were dissimilar from the children’s version. This indicated a stable interpretation of the factors over time, but a somewhat different interpretation between groups of informants. Based on the item content of the factors, we labelled them Support-seeking (Factor 1), Active (Factor 2) and Withdrawal/Oppositional (Factor 3). See Table 3 for details.

CFA analyses of the SDQ scale, teacher form confirmed the theoretical five-factor structure (Goodman, 2001). Longitudinal CFA analysis indicated that the factor structures were conceptually the same (see Appendix A) and overall model fit indi-

Table 1. Model fit and eigenvalues for EFA of Kidcope (1–5 factors), child and parent forms.

Number of factors	Children’s model			Parents’ model		
	RMSEA	CFI	Eigenvalues	RMSEA	CFI	Eigenvalues
1	.050	.695	3.687	.120	.358	2.537
2	.032	.894	2.033	.089	.720	2.272
3	.027	.938	1.378	.047	.940	1.681
4	.018	.977	1.199	.037	.974	.889
5	.007	.998	1.030	n.a.		

Notes: Rotation GEOMIN/OBLIQUE; n.a. = not available; analyses performed on data obtained from the first data-collection.

Table 2. Latent variable regression model – ESEM analysis of the Kidcope scale, children form.

Items	Pre-test			Post-test		
	Act/ Emreg	Withdr	Oppos	Act/ Emreg	Withdr	Oppos
Try to see the good side of things	<b>.698</b>	.001	–.367	<b>.719</b>	.001	–.427
Try to feel better by spending time with others like family or friends	<b>.693</b>	–.157	.003	<b>.718</b>	–.187	.004
Try to calm yourself down.	<b>.667</b>	.001	–.196	<b>.690</b>	.001	–.229
Try to sort out the problem by thinking of answers	<b>.655</b>	–.242	–.004	<b>.679</b>	–.288	–.004
Wish the problem had never happened	<b>.574</b>	–.006	<b>.318</b>	<b>.595</b>	–.007	<b>.372</b>
Wish you could make things different	<b>.524</b>	.006	<b>.313</b>	<b>.542</b>	.007	<b>.366</b>
Do something else	<b>.493</b>	.119	–.189	<b>.510</b>	.142	–.221
Try to sort it out by doing something or talking to someone about it	<b>.650</b>	–.356	.013	<b>.673</b>	–.424	.015
Try to forget it	.216	<b>.413</b>	–.016	.224	<b>.492</b>	–.019
Blame yourself for causing the problem	–.050	<b>.382</b>	.018	–.051	<b>.455</b>	.021
Stay on your own	–.045	<b>.470</b>	.087	–.047	<b>.560</b>	.102
Keep quiet about the problem	.045	<b>.462</b>	.097	.047	<b>.549</b>	.114
Do nothing because the problem could not be sorted anyway	.013	<b>.485</b>	.078	.014	<b>.577</b>	.092
Blame someone else for causing the problem	.089	.017	<b>.435</b>	.091	.020	<b>.508</b>
Shout, scream or get angry	–.007	.246	<b>.319</b>	–.007	.292	<b>.373</b>

Notes: Standardized factor loadings; Factor loadings > .30 are in boldface;  $n = 1328$ ; Pre-test = before the intervention, Post-test = after the intervention; Act/Emreg = Active/Emotional Regulation, Withdr = Withdrawal, Oppos = Oppositional.

ces were good (RMSEA = .028, CFI = .969, TLI = .966). Strong measurement invariance over time was established ( $\Delta\text{CFI} = -.004$ ).

In accordance with earlier examinations of the parent's SDQ forms (Holen et al., 2012), our CFA analysis of pre-test data indicated that the theoretical five-factor structure did not have an exact fit to the data. This is consistent with previous CFA studies that suggest a somewhat unclear construct and meaning of the Prosocial Behaviour subscale (VanRoy, Veenstra, & Clench-Aas, 2008). Thus, the model was modified to include the items that cross-loaded saliently on the factor Prosocial Behaviour, and new CFA analysis was performed. Acceptable model fit for the modified longitudinal model was obtained (RMSEA = .021, CFI = .953, TLI = .949), and furthermore, measurement invariance over time was confirmed ( $\Delta\text{CFI} = -.002$ ). See Appendix B for more details.

### Overall effects

Overall, the mean values of the factors, when analysed as composite scores, indicated that both children in the control and the intervention groups improved their coping skills and mental health outcomes (see Table 4). However, there are some exceptions. As measured by the parents, Active coping strategies were slightly reduced in the control group. Furthermore, as assessed by the teachers, Hyperactivity/Inattention and Impact scores were reduced in the Intervention

Table 3. Latent variable regression model – ESEM analysis of the Kidcope scale, parent form.

Items	Pre-test			Post-test		
	Emreg	Active	With/ Opp	Emreg	Active	With/ Opp
Tried to see the good side of things and/or concentrated on something good that could come out of the situation	<b>.723</b>	.141	.018	<b>.749</b>	.143	.020
Thought about something else; tried to forget it; and/or went and did something else to get it off his/her mind	<b>.555</b>	-.027	-.079	<b>.575</b>	-.027	-.089
Realised that someone else caused the problem and blaming them for making him/her go through it	<b>-.420</b>	.061	.252	<b>-.435</b>	.062	.283
Yelled, screamed or hit something.	<b>-.391</b>	-.012	<b>.391</b>	<b>-.404</b>	-.012	<b>.439</b>
Tried to calm him-/herself down by talking to him-/herself, praying, taking a walk or just trying to relax	<b>.363</b>	.035	<b>.425</b>	<b>.376</b>	.036	<b>.477</b>
Thought of ways to understand the problem and tried to actually solve it	<b>.464</b>	<b>.459</b>	-.018	<b>.480</b>	<b>.465</b>	-.020
He/she just accepted the problem because he/she knew he/she could not do anything about it	<b>.450</b>	<b>-.323</b>	.090	<b>.466</b>	<b>-.327</b>	.101
Turned to his/her family, friends or other adults to help him/her feel better	-.181	<b>.638</b>	.065	-.187	<b>.646</b>	.073
Talked about how he/she was feeling	.009	<b>.723</b>	.112	.010	<b>.731</b>	.126
Stayed away from people, kept the feelings to him-/herself and just handled the situation on his/her own	-.003	<b>-.501</b>	<b>.393</b>	-.003	<b>-.508</b>	<b>.442</b>
Kept thinking and wishing this had never happened; and/or that he/she could change what had happened	.115	-.221	<b>.605</b>	.119	-.223	<b>.680</b>
Realized that he/she brought the problem on him-/herself and blamed him-/herself for causing it	-.030	-.236	<b>.539</b>	-.031	-.239	<b>.605</b>

Notes: Standardized factor loadings; Factor loadings > .30 are in boldface;  $n = 1300$ ; Pre-test = before the intervention, Post-test = after the intervention; Emreg = Emotional Regulation, Active = Active, With/Opp = Withdrawal/Oppositional.

group only. Further analyses indicated that there were no significant differences between the intervention and the control groups at pre-test on any of the outcome measures.

Results from the latent variable regression models investigating whether children who participated in the Zippy's Friends' programme improved coping skills or mental health outcomes suggested that the programme had a positive impact on some, but not all of the outcome measures (see Table 5).

While the children reported a significant reduction (Cohen's  $d = -.380$ ) in oppositional coping strategies, their parents reported a significant increase in active strategies (Cohen's  $d = .186$ ; see Table 4). No significant effects were discovered in the mental health subscales as assessed by the SDQ. However, teachers reported a significant decrease in impact score (Cohen's  $d = -.146$ ).

Table 4. Descriptive statistics of composite scores for each factor as measured by Kidcope (children and parent form) and SDQ (parent and teacher form).

Informant	Scale	Factor	Pre-test				Post-test			
			Intervention		Control		Intervention		Control	
			Mean	SD	Mean	SD	Mean	SD	Mean	SD
Children	Kidcope	Active/Emotional Regulation	.844	.194	.838	.204	.882	.165	.869	.192
		Withdrawal	.330	.257	.310	.243	.282	.251	.290	.245
		Oppositional	.561	.226	.566	.236	.511	.203	.552	.211
Parents	Kidcope	Emotional Regulation	1.14	.354	1.14	.330	1.18	.322	1.19	.336
		Active	1.30	.372	1.29	.389	1.31	.338	1.27	.356
		Withdrawal/oppositional	.59	.343	.58	.369	.61	.352	.59	.359
Teachers	SDQ	Emotional symptoms	1.48	1.74	1.52	1.89	1.36	1.61	1.31	1.80
		Conduct problems	1.12	1.23	1.15	1.36	.95	1.16	.96	1.25
		Hyperactivity/inattention	2.88	2.14	2.92	2.23	2.71	2.05	2.83	2.19
		Peer relationship Problems	.96	1.41	1.09	1.64	.96	1.40	1.09	1.50
		Prosocial behaviour	8.04	1.27	8.07	1.30	8.20	1.27	8.23	1.23
Teachers	SDQ	Impact score	.244	.832	.305	1.12	.256	.887	.354	1.19
		Emotional symptoms	.89	1.60	.82	1.46	.91	1.53	.80	1.47
		Conduct problems	.67	1.34	.71	1.36	.60	1.29	.66	1.29
		Hyperactivity/inattention	2.45	2.50	2.50	2.70	2.22	2.70	2.51	2.67
		Peer relationship problems	.85	1.50	.90	1.53	.76	1.26	.81	1.45
Teachers	SDQ	Prosocial behaviour	7.87	2.21	7.71	2.25	8.12	2.10	7.78	2.21
		Impact score	.436	1.12	.378	1.03	.347	.961	.464	1.19

Notes: Pre-test = before intervention; Post-test = after intervention; Children's scores range from 0 to 1; Parents' Kidcope scores range from 0 to 2; Teachers' and Parents' SDQ scores range from 0 to 10, whereas the impact scores range from 0 to 6 for teachers and 0 to 10 for parents.



Table 5. Regressions (Std  $\beta$ ) between latent variables and main effects (Cohen's  $d$ ) of intervention, as measured by Kidcope (children and parent form) and SDQ (parent and teacher form).

	Children			Parents							Teachers							
	Kidcope		Act/ emreg	Kidcope			SDQ				SDQ							
	Withdr	Oppos		Emreg	Active	Withdr/ opp	PRO	HIN	EMO	CON	PPR	Impact	PRO	HIN	EMO	CON	PPR	Impact
Std. $\beta$	.411	.500	.403	.676	.689	.581	.806	.813	.777	.772	.801	.629	.762	.839	.801	.817	.801	.626
Cohen's $d$	.084	-.010	-.380*	-.058	.186**	.144	-.031	-.032	.025	-.024	-.040	-.034	.176	-.098	.117	-.057	-.047	-.146*
$n$		1328			1300				1301			1155			1322			1211

Notes: Act/Emreg = Active/Emotional Regulation; Withdr = Withdrawal; Oppos = Oppositional; Emreg = Emotional Regulation; Withdr/Opp = Withdrawal/Oppositional; PRO = Prosocial Behaviour; HIN = Hyperactivity/Inattention; EMO = Emotional Symptoms; CON = Conduct Problems; PPR = Peer Relationship Problems; n = number of participants included in the analyses.

\* $p < .05$ .

\*\* $p < .01$ .

### Subgroup effects

When we investigated whether Zippy's Friends had any positive effects on subgroups, only assessments with significant overall effects were included: Kidcope, children and parent form and the impact score as assessed by teachers (see Table 6). Preliminary analyses indicated no subgroup effects on the SDQ subscales.

Based on the children's reports, *girls* who were exposed to the intervention used significantly less oppositional coping (Cohen's  $d = -.551$ ) relative to their control counterparts (see Table 5). Similarly, the parents reported a significant increase in active coping strategies (Cohen's  $d = .258$ ). Low SES children in the intervention group reported less oppositional coping than children in the respective control group (Cohen's  $d = -.443$ ). Teachers reported that behavioural and emotional difficulties had reduced impact on intervention group *boys* compared to controls (Cohen's  $d = -.224$ ).

Except for the Kidcope parental assessments and the SES subgroups, all scales were invariant across subgroups. The number of participants in the control and intervention groups was approximately equal for all subgroups.

## Discussion

### Overall effects

The main objective for Zippy's Friends is to improve children's coping skills. As hypothesised, both children and parents in the intervention group reported positive effects in several coping strategies compared to controls. However, the coping pattern and direction of change differed somewhat between informants. Whereas the children's assessments indicated that their oppositional strategies were reduced, parents reported an increase in active and support-seeking coping strategies in the intervention group compared with the controls. This may suggest that, as judged by parental scores, the children attending Zippy's Friends were more active and support seeking when being rejected by peers. The self-reported reduction in oppositional strategies may indicate that the children had learned alternative strategies instead of screaming and blaming others when handling peer rejection at school. On the other

Table 6. Effects (Cohen's  $d$ ) grouped by sex and SES, as measured by Kidcope (child and parent form) and SDQ (teacher's impact score).

Informant	Scale		Sex		SES	
			Boy	Girl	Low	High
Children	Kidcope	$n$	672	656	454	818
		Active/Emotional Regulation	.122	.025	.143	.025
		Withdrawal	.011	-.040	-.068	.072
		Oppositional	-.166	-.551**	-.443*	-.352
Parents	Kidcope	$n$	658	642		
		Emotional Regulation	-.066	-.038	n.i.	
		Active	.088	.258*		
		Withdrawal/Oppositional	.090	.215		
Teachers	SDQ	$n$	619	592	411	756
		Impact	-.224**	.001	-.110	-.055

Notes: n.i. = not invariant over subgroups; SES = social and economic status;  $n$  = number of participants included in the analyses.

\* $p < .05$ .

\*\* $p < .01$ .

hand, the mean value of the children's coping factor Active/Emotional Regulation was close to its maximum value (see Table 4), suggesting that possible enhancements in these strategies might be difficult to detect. One may also question whether the positive effects on oppositional strategies as assessed by children were partly a reflection of the words and concepts they learned in the programme or rather than an actual improvement in their coping skills. However, an increase in active coping strategies was reported by parents observing their child outside the school environment.

Neither the teachers nor the parents reported improvement in mental health outcomes compared with controls as measured immediately after the programme was completed. It may be of interest to notice that several mental health problem and the impact scores of SDQ were close to the minimum values in addition to having large standard deviations, indicating that the measurement may not be sufficiently sensitive to change (see Table 4). This may be due to the population-based sample of the study, where psychological problems usually are relatively scarce. However, preliminary analysis selecting only children above cut-off values on problem scores confirmed the absence of findings, and indicated that the programme had no short-time effects on mental health problems. To our knowledge, no previous studies investigating the effects of universal programme on mental health outcomes have described similar 'floor-effects'. Furthermore, the absence of results on mental health problems matches findings from previous studies of universal programmes targeting depression and anxiety (Sawyer et al., 2010; Spence, Sheffield, & Donovan, 2005).

In the present study, teachers reported that the impact of the total symptom load on children and their surroundings was significantly reduced in the intervention group. The demonstrated reduction in the impact of mental health difficulties may be of significance, because the impact score may constitute a better guide to psychiatric caseness than symptom scores (Goodman, 1999). Nevertheless, one may question whether it was the children's difficulties or the teachers' perceptions of those difficulties that improved. If we assume it was the latter, previous research underlines the importance of positive attitudes among teachers when it comes to promoting a child's success (Hamre & Pianta, 2005; Pianta & Stuhlman, 2004).

According to standards stated by Cohen (1988), the overall effect sizes were small. However, equal effect sizes may not be interpreted similarly in different studies (Sun, Pan, & Wang, 2010). Therefore, Sun and colleagues recommended that one should compare effect sizes between similar studies when interpreting the size of the effects. Previous universal intervention studies aiming at positive mental health promotion support our findings, and report small to moderate effect sizes, ranging from .15 to .37 (Adi et al., 2007). Still, they are not necessarily unimportant. Even statistically small effects can have major public health implications if they influence a universally important outcome, such as children's well-being (Weisz, Sandler, Durlak, & Anton, 2005). Previous studies indicate that if young children have a repertoire of effective coping strategies, it can serve as a 'buffer' or 'moderator' of the effects of negative stressors on the development of psychological problems (Pincus & Friedman, 2004; Valiente et al., 2009). Furthermore, instituting protective factors that promote mental health has the potential to reduce the burden of later problems associated with poor mental health (Greenberg, 2010). Long-term follow-ups are required to document if unwanted development has been prevented, especially when it comes to more persistent problems such as mental health difficul-

ties (Weisz et al., 2005). It is also important to evaluate whether the positive short-term effects persist, including the possible positive reinforcement effects of improved coping and teachers' attitudes.

### ***Subgroup effects***

For parental reports, subgroup analyses based on different levels of the SES variable was not possible due to lack of invariance in factor structure (see Table 4). This may indicate that parents from a low socio-economic background would interpret coping differently from parents in the high socio-economic subgroup. All other grouping variables were invariant, thus a common interpretation of latent constructs across subgroups was confirmed.

Subgroup analyses comparing those attending the Zippy's Friends programme with controls indicated somewhat divergent results. As rated by the children, oppositional strategies were reduced in girls and children in the low socio-economic status subgroup. Assessed by parents, active and support-seeking coping strategies increased in girls. As rated by the teachers, the impact of having mental health problems was reduced in boys.

The absence of positive findings on coping skills in boys as assessed by the children should be noted. A programme such as Zippy's Friends, which requires a certain level of cognitive and oral skills, may be easier to adapt for girls. It may also be more convenient for the teachers to concentrate on 'clever girls' during the lessons, because they often give desired reactions and answers. Whether the reduction in oppositional strategies reported by children is an unconditionally positive finding for girls may also be questioned, especially when it comes to the item 'blaming others'. One may conceive that girls often blame themselves for the problems they experience, and blaming others may sometimes be appropriate. Furthermore, girls may already use relatively few oppositional strategies. Nevertheless, this picture is unclear because, in contrast to the children, parents indicated an increase in active and support-seeking coping strategies in girls. Furthermore, less oppositional behaviour and an increase in both giving and receiving peer support, even in girls, may lead to a better classroom atmosphere, which also may have a positive long-term influence on children at risk. The diversity of subgroup results indicates that the picture is complex and needs further investigation.

### ***Strengths and limitations***

Since all participating schools were recruited from geographical target areas administratively chosen for disseminating the Zippy programme, they may not be representative for the country as a whole. However, analyses showed that schools from both urban and rural areas from the northern, middle and southern part of Norway were included. Norway has a rather egalitarian society, which also was reflected in the low level of variance between schools on outcome variables.

Although the schools were randomly assigned into intervention and control groups, they were not randomly selected to take part in the study. Participating schools from the target areas were voluntary enrolled to the programme, and may therefore be slightly more typical of schools that are positive to this kind of intervention. However, since this would apply to all schools that enrolled in the programme, differential motivation at the school level cannot explain the difference between the intervention and the control groups that was observed in the study.

Another issue is that the teachers reported that they made some minor changes in the programme during implementation. This being an effectiveness and not an efficiency study, one may expect (and even encourage) minor local adaptations in the programme, for example, based on incidents at the individual school. However, additional neutral observations during programme implementation would have been valuable in order to assess the treatment fidelity and other challenges to the implementation process further.

The lack of a theoretical factor structure and the presence of salient cross-loadings on Kidcope (see Tables 1 and 2) may call the validity of the factors into question. Still, the factor structures for both sets of informants were invariant over time, indicating stable latent constructs.

The overall effect sizes were small, which may be expected based on previous studies (Adi et al., 2007). However, as an effectiveness study conducted under real-world conditions, other factors may have influenced the effect size. There is a strong component of social skills training in most Norwegian primary schools, exemplified with 25% of the control schools running another social skills programme. In addition, schools were initially selected based on an expression of interest. Thus, it is possible that the selected schools were improving prior to selection (Sawyer et al., 2010).

As far as we know, this is the first randomised, controlled trial of a universal programme to promote coping skills in young children that has accounted for the clustering of school data. Other strengths of this study were the large sample size, multiple informants and a low rate of missing data. All analyses were adjusted for baseline levels of coping and mental health. In addition, the teachers' reports indicate that they administered the programme with reasonable fidelity to the programme guidelines.

## Conclusion

The aim of the present study was to explore possible individual effects of Zippy's Friends, which is a school programme implemented by teachers in regular classes. The programme's main objective is to prevent mental problems by broadening children's coping repertoire. Analyses suggested that Zippy's Friends had a small but positive effect on the children's coping skills as well as on the impact that possible difficulties might have in class. The results from subgroup analyses, however, were less clear. Even though they imply positive findings in children who came from families categorised as low in socio-economic status, the improvement in coping strategies in girls and not in boys need further exploration. It may also be important to consider possible adjustments in the programme to meet the needs of boys better. Furthermore, studies to explore possible long-term effects are recommended.

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