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Early intervention for at risk children: three year follow up

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Child psychiatric disorders and their associated suffering, functional impairment and costs to society have become common in developed societies.<sup>1,2,3,4</sup> This has led to a search for effective prevention technologies, often now classified as universal and targeted.<sup>5</sup> The former focus on ‘all children in a geographic area or setting...’, the latter on those belonging to a high risk group such as children of families dependent on welfare (selective) or who have already developed symptoms (indicated).<sup>5</sup>

An example of an early ‘universal’ intervention comprised parent training, a behaviourally based classroom curriculum and work in small groups for 1<sup>st</sup> grade children from a poor area.<sup>6</sup> Compared to school as usual, this was associated with reduced externalizing scores on teacher scales a year later. A more recent example, the ‘LIFT’ program, evaluated a brief parenting and school based intervention conducted over ten weeks involving all children in 1<sup>st</sup> or 5<sup>th</sup> grade in schools drawn from areas of higher than average delinquency.<sup>7</sup> The authors reported reduced playground-observed aggression in the year after intervention. Both interventions showed effects that were most striking among those parents and children whose initial scores were most deviant.<sup>6,7,8,9</sup> Others have demonstrated a similar phenomenon.<sup>10,11,12</sup> Although often effective, universal interventions have the disadvantage that most children participating are low-risk and do not require intervention.

Targeted and especially indicated interventions have the advantage of excluding asymptomatic children and, in the evaluation phase, of focusing on smaller numbers. The Montreal Prevention Experiment is ‘a prime example’.<sup>13,14</sup> This study randomized 250 7-9 year old boys who were screen-positive for disruptiveness according to teacher ratings (drawn from 1161 screened boys) to a two year combined school-based group work and parent training intervention or to a no-intervention control.<sup>15, 16</sup> Intervention was associated with reduction in conduct disorder and delinquency five and seven years respectively following intervention, a greater likelihood of high school graduation and a lower rate of criminality fifteen years post intervention.<sup>17</sup> The similar Coping Power intervention deployed school-based children’s and parent’s groups, for boys screened positive for aggression over a 15 month period also showed promising results. At one year follow-up compared to no-intervention control intervention boys showed reduced behaviour problems at school, ‘covert delinquency’ and parent-reported substance use.<sup>18</sup> A larger, more elaborate intervention (additional school tutoring, group work, home visiting, parent-child sessions and a universal social and emotional curriculum sustained over five school years) was associated

with only a modest reduction in behavioural symptoms.<sup>19</sup> These and other data suggest that a limit could exist beyond which an intervention becomes too complex for some vulnerable populations.<sup>20</sup>

Whether as part of a universal or targeted intervention, the effectiveness of behavioural interventions, particularly in school, has been known for many years and has been replicated.<sup>21,22,23</sup> However, use of even the relatively simple techniques involved is not widespread or routine reflecting the difficult issue of non-dissemination of evidence-based techniques into everyday prevention practice.<sup>24</sup> This has been attributed to many factors that increasingly appear to be intractable.<sup>5, 24</sup> Focusing on the evaluation of interventions that are already routinely implemented should in principle avoid this problem. Adapting an insight from the treatment field, evaluating and identifying what interventionists actually do successfully may be an alternative route to building effective and sustainable interventions.<sup>25</sup> A major example from the UK is the nationally implemented Sure Start program which focused on enhancing the development of pre-school children from poor areas.<sup>26</sup> The program shares characteristics with other pre-school interventions that appear to have shown lasting benefits.<sup>27, 28</sup> However, the project as a whole proved difficult to evaluate as it lacked a control group and differed in content from centre to centre.<sup>26,29</sup> Further, such studies are rare: only 13% of the prevention studies in a meta-analysis were routine interventions among which the authors retrieved only one randomized trial.<sup>30</sup>

A further issue concerns what precisely is the active ingredient in interventions.<sup>24</sup> For instance, whether alone or within a more complex intervention group work is common to many intervention studies and is widely deployed in routine interventions.<sup>31, 32</sup> However, groups may use a variety of techniques, such as educational<sup>19</sup>, nurture or play<sup>23</sup>, behavioural<sup>11</sup> or cognitive-behavioural<sup>33,35,37</sup> that are rarely compared. Consequently, whether it is the precise theory-based content or the group intervention format that influences outcome is unknown.

This paper reports the two and three-year outcomes of a randomized controlled trial of a routine school based targeted intervention and includes a reanalysis of the initial fifteen months of the study. The study compares two group interventions: drama group therapy (DGT) with small group teaching of mathematics and English (curriculum studies - CS) on the self-, parent- and teacher-ratings of adjustment of symptomatic boys and girls. A charitable organization based in the North-East of England (<http://www.learningchallenge.org.uk/>) developed and trained teachers in the DGT techniques for routine

use in a number of schools. In the evaluation, the DGT and CS interventions were delivered by a drama group therapy trained teacher. The study is therefore an evaluation of the effectiveness of existing routine practice. We hypothesized that compared to the CS intervention, the DGT would have a greater immediate and long term effect on behavioural and emotional symptoms as rated by teachers, parents and children. In the initial publication<sup>37</sup> at one year follow-up DGT was associated with a significantly greater decline in overall teacher-reported symptoms than waiting list or CS. Curriculum studies (CS) was initially conceived of simply as a control intervention but the data showed that it was more effective than waiting list control i.e. that it was a potentially active intervention.

## **Method**

### *Participant selection*

In order to identify children in mainstream schools at risk of emotional and behavioural problems, a series of criteria were agreed through discussion with teachers. These included one or more of the following criteria: (i) scholastic under-performance, (ii) known major family problems, (iii) ill-nourished or poorly cared for appearance, (iv) impaired peer relationships and (v) behavioural or emotional difficulties; a mixture of selective (i-iii) and indicated (iv-v) criteria.<sup>5</sup> The children attended primary, middle and high schools in a predominantly working class area in the North of England. Once identified, the schools approached parents to explain the intervention and the evaluation and to seek agreement for their children's participation. Contact was made by letter and included the offer of an interview with a designated member of staff. In addition meetings in each school provided forums for parents to hear more details and to discuss the project. None of the parents refused their child's initial participation. The Newcastle-upon-Tyne research ethics committee approved the project.

### *Numbers, randomisation and follow-up*

Teachers identified 122 children meeting the selection criteria, approximately 40% of the total population available, from three primary (up to year 6), one middle (spanning year 5 through 8), and one high school (from year 7). The children were allocated by the school-teacher who knew them (but who did not know to which intervention they would be allocated) on the basis of a broadly equivalent mix of

problems and severity of disturbance to blocks of eight. All groups included males and females. A member of the intervention team who did not know the children randomly allocated each block to DGT or CS. In order to ensure an adequate mix of problems or to avoid a particularly volatile grouping, in consultation with teaching staff, a total of eight children were exchanged post allocation between DGT and CS. The process of 'balancing' the groups was regarded by the research team as crucial in order to ensure viable groups. Both types of group occurred within each school. At the time of selection there were no significant differences between the problem scores of the two intervention groups (CS and DGT) according to teacher, parent or self-reports. The ages of the children in the CS (mean age 11.3 years, SD 1.3) and DGT groups (mean age 11.4 years, SD 1.1) were similar.

Over the course of the study the research team maintained links with the schools. Contact was maintained with parents through school meetings, letters and home visits. The interventions were presented as an additional optional service offered within the school. Parents were offered the opportunity to freely opt out which none did at the initial stage. Over the life of the project teachers were approached to complete questionnaires by key contacts in the schools, often the year head. The same process was used with the children who were approached discreetly to complete the questionnaire during the school day. Teachers were reimbursed for their time, parents and children received no incentives.

### *Blind ratings*

Since the same therapist was responsible for both interventions, it is likely that teachers and parents were blind to intervention status. By one year follow-up most children had changed school or had changed teachers. For the two and three year follow-up it is likely that all teachers were blind to intervention status.

### *Intervention*

The intervention was staggered in cohorts across three school terms. The DGT and CS groups each ran for an hour a week over a 12 week period. Groups were conducted during school hours. No child refused to participate in the groups. Interventions comprised drama group therapy - DGT 'essentially play, guided ... to ... the acquisition of personal and social skills',<sup>38</sup> comprising reflective discussion and role play

conducted by a drama therapy trained teacher. Role play was central to the drama therapy and involved mini-plays using themes suggested by the children themselves. These included disciplinary episodes involving teachers or police, family difficulties and peer issues, seeking alternative practicable solutions that appeared more satisfactory from the perspective mainly of the children themselves. Sessions were structured through activity designed to reflect the stages of group formation and the perceived needs of the children. Each group therefore had a slightly different content, but all were structured towards the therapeutic re-enactment of 'live' situations reflecting the experience of the group. These brief role-plays were usually preceded by exercises of controlled emotional expression and with the intention of creating a holding structure for experience. Following the role play, the group would reflect on its dramatic qualities and 'truth'. Finally, and importantly, the role play was re-enacted to establish positive alternative outcome scenarios. These alternative scenarios comprise the analysis and psychoeducation of the group. The curriculum studies (CS) also took place in school. The children were encouraged in the formation of a positive peer group that focused on developing skills in mathematics and English. During these sessions no attempt was made to investigate any emotional/behavioural issues, but the pedagogy was strongly inclusive and supportive, with clear expectations for conduct. The trained teacher used focused praise for achievement of task outcome and for collaborative behaviours shown by the group.

#### *Procedures for follow-up*

Three major outcome domains were identified:

- i. The Teacher Report Form (TRF) is a widely used questionnaire in child and youth mental health clinical practice and research, generating data across areas of positive as well as negative adjustment. Scores are generated on eight subscales within two broad areas of externalizing (e.g. 'delinquent' or 'aggressive behavior') and internalizing behaviors (e.g. 'withdrawn, anxious-depressed, somatic complaints').<sup>39</sup>
- ii. The Youth Self-Report (YSR) is similar to the TRF, focusing on child-report symptoms.<sup>39</sup>
- iii. The parent-completed Child Behavior Checklist (CBCL) identifies parent perceptions of child symptoms. These questionnaires show good reliability and validity in US and European populations.<sup>39, 40, 41</sup>

## Attrition

Figure 1. represents the numbers of children traced and for whom parent, teacher or self-report data were available. There were no significant differences in initial TRF, CBCL or YSR scores, caseness, gender, or school type between participants successfully traced at two and three years and those lost to follow-up. At two year and three year follow-up, some youths missing at an earlier phase were successfully re-traced. This meant that not all the cases seen at three-years had necessarily been involved in the two-year follow-up, and similarly for the two year follow-up data. If a parent refused to complete a follow-up questionnaire, we did not seek teacher or self reports, taking refusal to mean withdrawal from the trial. Of the 120 children initially entering the trial, 27 were lost to follow up due to moving away (8), leaving school (12) or refusing (7). Of those remaining, teacher data (the most complete) was available on 82% at two years and 69% at three years follow up. Table 1 shows the gender and age of the children at different follow-up points.

Place figure 1. here

Place table 1. here

Place table 2 here

## Analyses

The current paper presents an analysis of intervention and three year follow-up data using latent growth modelling of questionnaire data via AMOS 16.<sup>42</sup> In contrast to the traditional statistical approach - which compares group averages of an outcome at each time point - the latent growth model (LGM) focuses on an individual's trajectory over a period of time. It summarises this trajectory into two basic components; an individual's underlying baseline score at the beginning of the process - termed the intercept, and an individual's rate of increase or decrease in score over a period of time - termed the slope. Thus an individual's progress at any point can be summarized by knowing their initial intercept, slope (rate of change per unit of time) and the time since baseline assessment. Further, because these estimates are based on multiple measures at multiple time-points measurement error is reduced. More complicated LGMs can accommodate non-linearity in the slope component, for example it is possible to model exponential growth



or step changes in trajectory sometimes seen in developmental processes.

A LGM with no covariates is called an unconditional model. However, as with standard regression, variables can be added to explain the variability in both intercept and slope outcomes - termed a covariate LGM. For example, if being male was positively associated with the intercept this would indicate a higher score at initial assessment among males; if positively associated with the slope, this would indicate that males' scores increased over time at a faster rate than girls'.

An unconditional LGM was fitted initially in order to assess the trajectory of internalizing and externalizing problems over the 3-years of the trial. To assess the impact of the intervention a second model with intervention status and two other relevant covariates, gender and school-type, were entered as dummy variables. Separate analysis was conducted using the total, internalizing, externalizing and all other questionnaire subscores. However because the subscore results were so similar to the internalizing /externalizing findings they are not reported here, but are available upon request from one of the authors (RY). Several measures of fit were used to assess the models; including the chi-square and the comparative fit index (CFI).<sup>43</sup> Adjustments for missing data were incorporated by using the full information maximum likelihood procedure for estimation.<sup>42</sup>

The TRF data were the most complete and analysis focused on this outcome. In LGMs, loadings (regression paths) from each TRF measurement to the intercept are fixed to 1; this provides an estimate of the underlying baseline TRF score. The paths between TRF measures and the slope are used to model the expected trajectory over time. Conventionally in a linear LGM these paths are fixed at intervals which reflect the passage of time. For example, the time-gap between the 2<sup>nd</sup> and 5<sup>th</sup> wave is 1-year and that between 2<sup>nd</sup> and 6<sup>th</sup> wave 2-years, typically we would fix these paths to 1 and 2 respectively in order to scale the slope to represent the expected change over a year; a relatively easy to interpret scale. Time-1 (beginning of waiting list) and time-2 (immediately pre-intervention) slope paths (also called loadings) should be fixed at zero, since both measures took place before the intervention, and were taken only a month apart. This approach suggests the most appropriate fixed slope loadings for t1 to t7 would be, 0, 0, 0.25, 0.5, 1, 2, 3 respectively. However, initial modelling of the TRF trajectories using these fixed parameters produced poor results, indicating that children's internalizing and externalizing problems followed a distinctly non-linear trajectory.

In order to incorporate this non-linearity the slope parameter estimates for loadings at year-one and slope were fixed at 1 and pre-intervention time-points loadings fixed at zero, and the remaining slope loading parameters freely estimated. Thus, the overall slope estimate remained interpretable on a change-per-year scale. The discrepancy between the obtained values of the freely estimated path loadings and their expected linear values can be used to evaluate the shape of the trajectory, or more specifically how it differs from a linear course. For example, the loading for 6-months should be approximately 0.5 on a linear trajectory - to indicate half a year's passage of time: if the estimate obtained is 0.75, this indicates an accelerated trajectory roughly 50% faster than that predicted from a linear course.

Unconditional LGM's produced models only trivially short of conventional acceptability (CFI, 0.88-0.89). Given the small sample, multiple time-points, non-linearity and missing data, this was deemed acceptable. A generic path diagram with conventional LGM notation for the unconditional and covariate LGM is shown in fig. 2a and 2b respectively.

Place figure 2a, 2b. here

## RESULTS

### Unconditional Growth model

Total TRF score: The results for the unconditional LGM are reported in table 2. In relation to baseline scores a mean (SD) intercept of 36.84 (2.64) TRF points was estimated, with the slope indicating that scores significantly decreased over time by approximately -17.59 (0.65) points per year. Caution must be used when interpreting these results because the decline over time is distinctly non-linear, with an accelerated decline from time zero to three months (from beginning to end of the intervention) equivalent to that expected from half-a-year's linear trajectory (i.e. a slope parameter estimate of 0.45 vs. 0.25 expected for a 3 months linear decline, table 2, 2<sup>nd</sup> column, last row). The slope begins to level out at one year with no further substantive change. Thus, a more accurate description of the model would be a rapid decline of -17.59 points over the first year which stabilizes so that after year-one the trajectory is relatively flat. This is illustrated clearly in fig-3, which shows the average TRF t-score over time for both DGT and CS groups. There was a strong negative correlation ( $r=-0.79$ ) between slope and intercept, indicating that individuals

with higher baseline TRF scores demonstrated a more rapid reduction in mental health problems over the following years.

Place table 3 (if included) and figure 3 here

#### Covariate Growth Model

Total TRF score: adjusting for covariates (see table 2) explained a significant amount of the variation in baseline TRF scores, reducing the variance of the intercept from 791.07 (109.42) to 549.06 (77.61). Including covariates reduced the mean TRF intercept to 23.28 (4.32) points, which is interpretable as the baseline TRF score for girls in elementary school who did not take part in DGT. Results suggest that being male and in high school was associated with a significant increase in baseline score of 13.36 (4.45) and 27.31 (5.26) TRF points respectively, while being in middle school significantly lowered baseline scores by -12.12 (5.03) points. As would be expected if assignment were random, intervention status was not associated with baseline scores.

Including the covariates in the LGM explained much (but not all), of the change in TRF score over time, reducing the variance of the slope from 661.12 (114.19) to 413.45 (78.45) and the mean slope from to -17.59 (0.65) to -11.15 (4.17) points decline per year. This suggests a significant proportion of the decline in TRF scores over time can be explained by age, since gender was unrelated to the slope. In comparison to primary school, beginning the intervention in middle school was associated with a significant increase in slope of 21.16 (4.90) TRF points, whereas starting in high school resulted in a significant decrease of -19.05 (5.10) points. In other words, during middle school teachers report children show worsening, while those in high school show improving mental health, independent of any intervention effects. The DGT intervention had a significant effect on the slope, reducing it by -9.67 (4.26) points. Again almost all of this reduction took place over the first year then stabilized over the following two years. When the analyses were repeated for externalizing and internalizing subscores, the effect of DGT intervention significantly reduced only externalizing scores by -3.96 (1.74) points over the first year. The intervention findings from analysis of parent and self-report questionnaires were not statistically significant.

## DISCUSSION

A previous paper described this randomized controlled trial and presented waiting list, intervention and 12 month follow-up data. The current paper presents a reanalysis and includes the two and three years follow up data. This trial contrasted two targeted routine small-group group interventions: a drama group therapy (DGT) intervention and a curriculum studies group (CS) both led by a drama group trained teacher. The format (small groups conducted in schools) and the dose (weekly sessions over a school term) were similar and both were conducted by the same teacher but the group work content differed. Our hypothesis that DGT would have a greater immediate and long term effect on behavioural and emotional symptoms was only partially proved.

Analyses show a decline in TRF scores during and immediately after intervention for the sample as a whole and that low scores were maintained through follow-up. They also confirm a more rapid decline in TRF scores in the DGT compared with CS groups. These findings show that this routine DGT intervention was effective in rapidly improving behavioural adjustment in schools. In contrast to subject teaching, the DGT emphasis on structured interaction, problem solving and role play initiated by the participants, characteristics similar to those of 'cognitively-oriented programs', was a primary difference between the two interventions and may have contributed to this accelerated change.<sup>30</sup> Also, consistent with an intervention effect, the DGT effect appeared only subsequent to the waiting list control period. In addition, natural history studies show that externalizing problems follow a chronic or gradually declining course and not the relatively abrupt desistence reported here.<sup>44, 45, 46</sup>

The data show that after their initial decline from just below the clinical cut-off (t-score 70), scores for both groups remained within the non-clinical range throughout follow-up. This common long term outcome suggests that the effects were partly attributable to aspects that were shared by the interventions. These shared group processes are likely to include routine meetings of a diverse group of young people that might not otherwise have repeatedly met, structured supervised interaction, limited elements of self-expression, befriending facilitated by an interested adult with characteristics previously shown to be of therapeutic value, empathy but also assertiveness.<sup>23</sup> Although it was not detected by the instruments used, it is possible some enhancement of social skills may have contributed.<sup>47, 48</sup> However, long term reductions of externalizing symptoms following group interventions have also been attributed to sustained change in peer

networks, that post-intervention include non-disruptive peers, mediating sustained reduction of externalizing behavior.<sup>15</sup> This peer group process could explain the greater group work effect on externalizing than internalizing behavior reported here and elsewhere.<sup>23</sup>

The data also showed that the higher the initial problem score, the steeper was the decline, consistent with findings elsewhere.<sup>6, 7, 8,9,49</sup> This may be attributable to so-called ‘discrepancy proportional peer influence’ so that the behaviour of those at the extremes is drawn toward the group mean.<sup>50</sup> If this is true, it requires the presence of some less overtly deviant peers in the therapeutic group. Their absence could explain the failure of an intervention involving a group of children all of whom scored at or above the 95<sup>th</sup> centile for teacher-rated aggression.<sup>51</sup> Indeed, if association with non-deviant peers is important in sustaining change, it seems crucial that all the participants do not show a high level of aggression.

Irrespective of which type of intervention received, starting the trial in high school was associated with a larger (but still negative) slope i.e. a more rapid decline in symptoms. In light of meta-analytic data showing that older children and especially older higher risk children showed lessened effects of preventive intervention,<sup>30</sup> this is surprising and could represent unmeasured differences between schools.<sup>52</sup> In keeping with meta-analyses, there was no effect of gender on outcome.<sup>31</sup>

No effect was found on parent or self-report. This may be in part because parent- and self-report data were less complete so that statistical power was less. It may also mean that the teacher-reported effect was not strongly mediated by changes in home-life or in subjective-well being. This fits with the view that effects of intervention tend to be ‘domain specific’ and that more complex, intensive or sustained intervention may be required to effect change elsewhere than at school.<sup>19</sup> It is consistent too with the possibility that early-adolescence is not the optimal time for intervention if it is to have widespread effects, unlike action taken pre-school.<sup>27</sup> Nevertheless, as peer associations appear central to so many adverse outcomes, if alterable by group interventions, multiple benefits beyond the school could potentially accrue, even at a relatively late age and even if not detected in this small trial.

Finally, group work can use a variety of techniques and, as demonstrated here, young people can benefit from quite disparate group techniques. As long as attention is paid to fundamentals such as group mix, the capacity of a reliable group leader to engage young people, and perhaps dose (i.e. the number of sessions), this means that effective group interventions may be a particularly accessible and flexible means

of targeted intervention. In an era of great difficulty for young people, they should be more widely deployed.

#### Limitations of the study

This study identified approximately 40% of the population as at-risk, reflecting our hybrid selective and indicated criteria. Because of the difficulty maintaining teachers blind to interventions, especially in small primary schools, it is possible that teachers were not blind to intervention status at initial one year follow-up. However, since the same therapist had conducted both interventions, it is likely that teachers were blind even at this stage. Nevertheless, we repeated the analyses for the last cohort who received their intervention during the final term of the school year. For this cohort the six months follow-up evaluation was conducted by their following year teacher who was likely to have been blind to whether the child had received DGT or CS or indeed any intervention. The findings remained essentially unchanged. It is very unlikely that by two and three year follow-up teachers were aware of intervention status. Change could also be partly attributable to regression to the mean. However, the absence of significant change over the waiting list period (McArdle et al 2002) suggests that this is unlikely to have made a significant contribution.

#### Conclusions

This study shows that a routine intervention achieved significant and sustained change in behavioural adjustment in school and that the greatest effect was evident for those with the most abnormal initial scores. It showed that a comparison group intervention with different content and process was associated with a slower onset of action but convergent outcomes three years post intervention. The findings are consistent with the possibility that, irrespective of differences in group process, sustained change following group therapy is partly or largely due to aspects of group intervention that are shared. Nevertheless, in the short term, the DGT exerted a more rapid onset of effect, suggesting that a more explicitly empathic, problem-solving and interactive process facilitates more rapid change. The findings suggest that professional-led school-based brief group work is an important public health technique.

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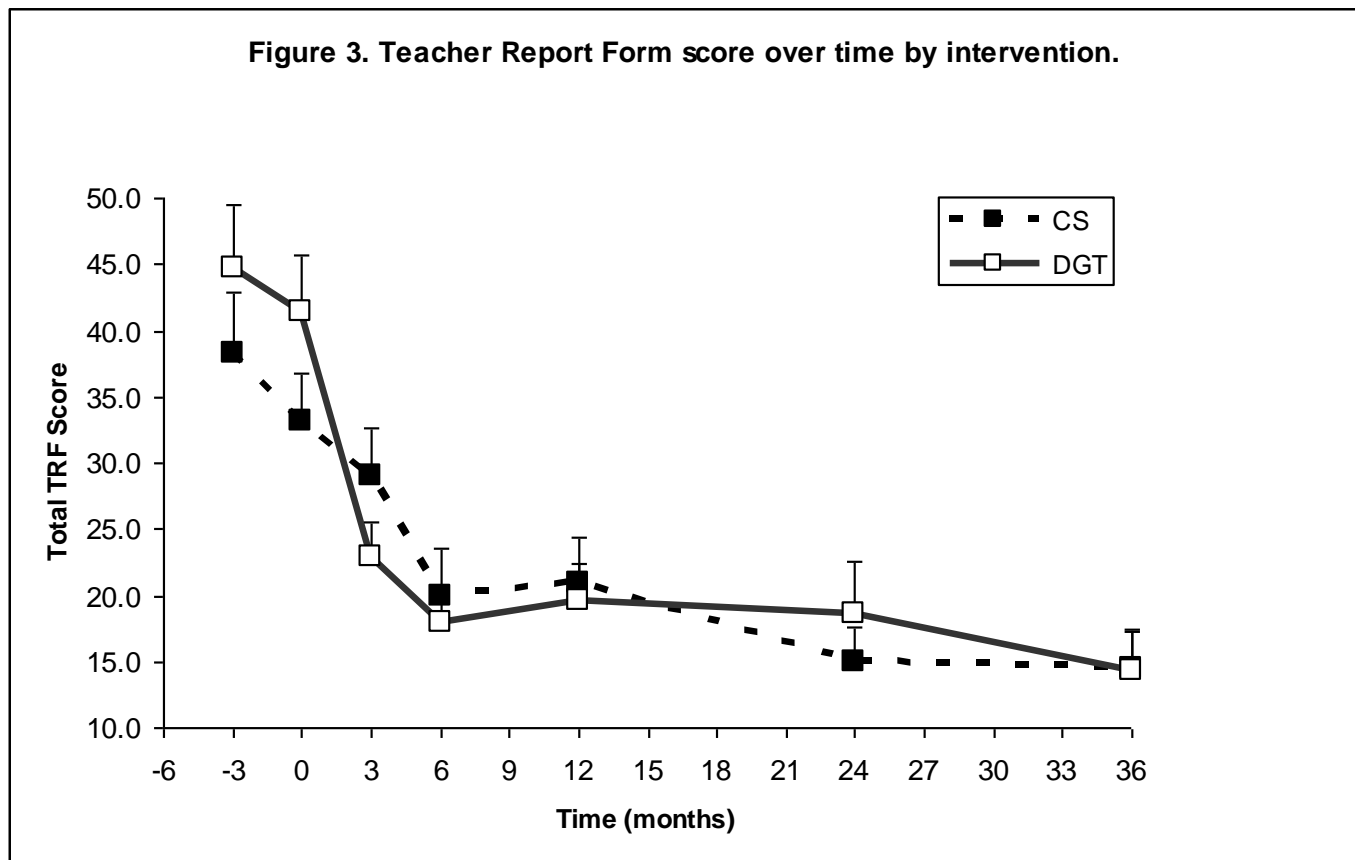
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Gender and ages of children at commencement and follow-up

	% female	Age in months	
		DGT	CS
Start intervention	43	140	138
end intervention	44	143	142
6 months	44	149	147
1 year	45	155	153
2 years	46	170	169
3 years	45	180	179

Table 2. Growth curve results for teachers report form, total score for full sample, N= 122.

Predictors	Total score			
	Unconditional		Covariates	
	Mean	SE	Mean	SE
<u>Intercept (Baseline score)</u>	36.84***	2.64	23.28***	4.32
Trial			6.45	4.43
Sex (male)			13.36**	4.45
School type				
(Primary)			-	-
Middle			-12.12**	5.03
High school			27.31***	5.26
<u>Slope (Change per year)</u>	-17.59***	0.65	-11.15**	4.17
Trial			-9.69*	4.26
Sex (Male)			-5.08	4.27
School type				
(Primary)			-	-
Middle			21.16***	4.90
High school			-19.05***	5.10

<u>Variances</u>				
Intercept	791.07***	109.42	549.06***	77.61
Slope	661.12***	114.19	413.45***	78.45
Slope/Intercept	-0.79***		-0.73***	
corr				
<u>Goodness of fit</u>	19		45	
(df)				
$\chi^2$	70.89		131.86	
CFI	0.88		0.83	
<u>Slope parameter</u>				
<u>estimates</u>	0, 0, 0.45, 1.00, 1, 1.00, 0.90		0, 0, 0.47, 0.98, 1, 0.97, 0.93	
(Time 1-7) <sup>1</sup>				

<sup>1</sup> Expected linear slope estimates for t1 to t7 (0, 0, 0.1, 0.25, 0.5, 1, 2, 3). Note: Bold fixed values, other parameters are estimated. CFI

= Comparative fit index.

\* p ≤ .05, \*\* p ≤ .01, \*\*\* p ≤ .001

Table 3. Growth curve results for TRF, externalising and internalising score for full sample, N= 122.

Predictors	Externalising score				Internalising score			
	Unconditional		Covariates		Unconditional		Covariates	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE
<u>Intercept</u>	12.36***	1.18	8.06***	2.16	10.20***	0.94	6.83***	1.51
Trial			2.87	2.22			1.82	1.55
Sex (male)			6.33**	2.23			1.25	1.56
School			-	-			-	-
(Primary)								
Middle			-5.02*	2.52			-3.76*	1.76
High			3.79	2.64			11.86***	1.84
<u>Slope</u>	-4.92***	1.07	-3.98*	1.70	-6.37***	0.90	-3.63*	1.41
Trial			-3.96*	1.74			-2.19	1.45
Male			-1.18	1.73			-1.91	1.45
School			-	-			-	-
(Primary)								
Middle			9.32***	2.03			5.94***	1.65
High			-3.44	2.06			-9.31***	1.74
<u>Variances</u>								
Intercept	155.39***	21.9	138.4***	19.4	100.82**	13.8	68.50***	9.62
					*	7		
Slope	93.84***	19.5	59.40***	14.0	83.58***	13.0	54.40***	8.90
						2		
	-0.70***				-0.96***			
Slope/Interc			-0.72***				-0.94***	
ept corr								
<u>Goodness of</u>	19		45		19		45	
<u>fit</u> (df)								
$\chi^2$	69.48		121.29		55.81		110.97	
CFI	0.88		0.84		0.89		0.84	
<u>Slope</u>								
<u>parameter</u>	0, 0, 0.50, 1.04, 1,		0, 0, 0.57, 1.05,		0, 0, 0.33, 0.99,		0, 0, 0.34, 0.98, 1,	
<u>estimates</u>	0.87, 1.07		1, 0.86, 1.11		1, 1.20, 1.03		1.18, 1.02	

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(Time 1-7)<sup>1</sup>

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<sup>1</sup>Expected linear slope estimates for t1 to t7 (**0, 0**, 0.1, 0.25, 0.5, **1**, 2, 3). Note: Bold fixed values, other parameters are estimated. CFI = Comparative fit index.

\*  $p \leq .05$ , \*\*  $p \leq .01$ , \*\*\*  $p \leq .001$



Figure 1. Intervention flow diagram

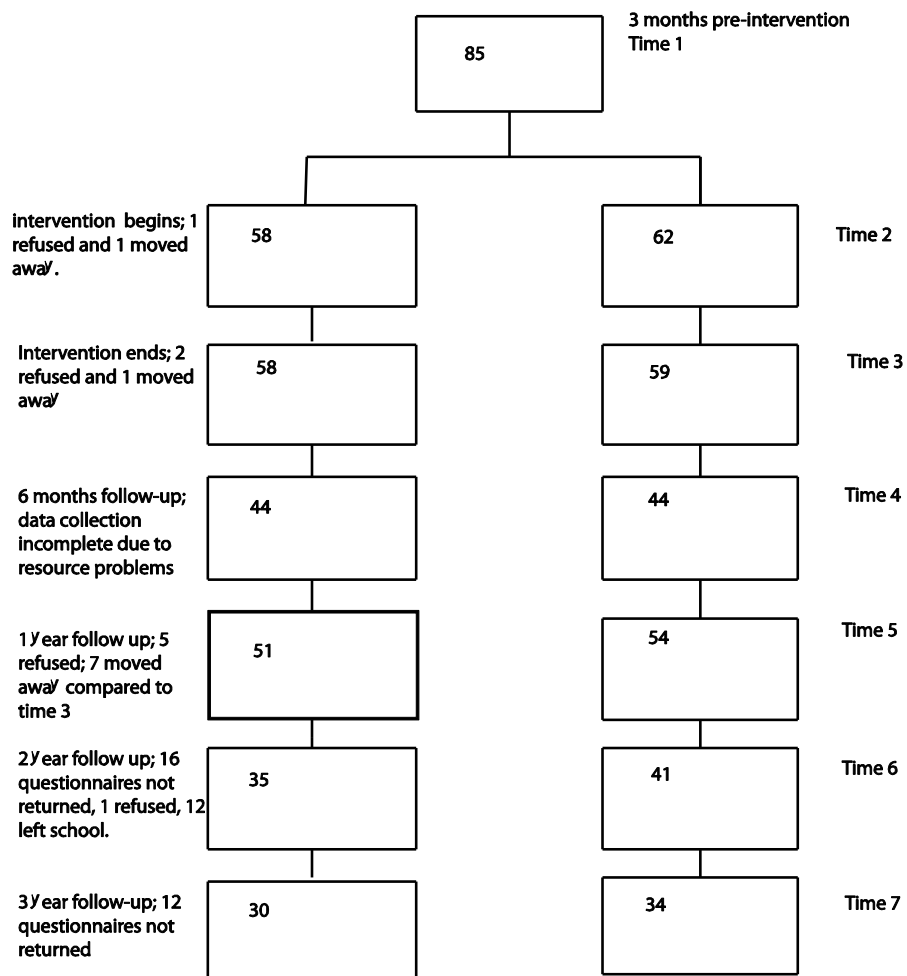


Figure 2. TRF total t-scores pre-intervention to three year follow-up.

