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The preventative effects of a brief, early intervention for preschool-aged children at risk for internalising: Follow-up into middle adolescence.

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The preventative effects of a brief, early intervention for preschool-aged children at risk for internalising: Follow-up into middle adolescence.

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Keywords:
Prevention; Early intervention; Internalising; Anxiety disorders; Depression
Abstract

**Background:** There are few evaluations of very early intervention for the prevention of internalising disorders and those that exist generally evaluate outcomes to a maximum of 12 months. The current study evaluated the very long term effects (11 years) of a brief internalising prevention program presented to parents of preschool aged children.

**Methods:** The original sample comprised 146 preschool-aged children who scored high on measures of inhibited temperament. Half of the parents were given a brief educational program (6-sessions) to assist them to help their children reduce anxiousness. Over 70% of the original sample was assessed for the current study, which occurred when the sample was approximately 15 years. They were assessed on current diagnoses of anxiety and depression, as well as symptoms of anxiety, depression, negative thoughts, and life interference.

**Results:** Compared with controls, girls whose parents had been through the early intervention program showed significantly fewer internalising disorders, maternally reported anxiety symptoms and self-reported life interference, and trends toward lower self-reported anxiety symptoms and self reported thoughts of loss and failure. Boys showed few differences.

**Conclusions:** A brief early intervention program delivered to parents of preschool-aged children who are at risk for later internalising distress shows lasting benefits for girls into the high-risk period of middle adolescence. Given the low costs associated with this program, these results show promise for strong public health benefits.
Over the past decade there has been a marked increase in childhood interventions aimed at prevention of internalising disorders. Several recent reviews, both qualitative and quantitative, have summarised the growing empirical database evaluating prevention programs for anxiety and depression (Cuijpers, Van Straten, Smit, Mihalopoulos, & Beekman, 2008; Fisak, Richard, & Mann, 2011; T. R. Gladstone & Beardslee, 2009; Horowitz & Garber, 2006; Neil & Christensen, 2009; Spence & Shortt, 2007; Stice, Shaw, Bohon, Marti, & Rohde, 2009; Teubert & Pinquart, 2011). The majority of reviews has concluded that prevention of internalising difficulties is both possible and promising.

Overall, the effects of prevention programs have typically been small. Controlled effect sizes for both anxiety symptoms and diagnoses of anxiety disorders have been around .2 s.d. (Fisak et al., 2011; Teubert & Pinquart, 2011). Prevention of depression has shown similar effect sizes (Horowitz & Garber, 2006; Merry et al., 2011; Stice et al., 2009). Small effects are not unexpected in the context of prevention. Across entire populations and with a potential lifetime impact, even small effects are very important. As expected given their marked comorbidity and common risks, programs aimed at prevention of one disorder (anxiety or depression) have typically been shown to also influence the other disorder. However, at least some evidence has indicated that the effects on the secondary disorder are less than those on the primary problem (Teubert & Pinquart, 2011), suggesting some specificity in prevention effects. Delivery of programs to entire populations (universal delivery) has generally been associated with smaller effects than delivery to children high on risk factors (selective) or showing symptoms of disorder (indicated) (T. R. Gladstone & Beardslee, 2009; Horowitz & Garber, 2006; Stice et al., 2009; Teubert & Pinquart, 2011).

The majority of prevention programs for internalising difficulties have been aimed at school-aged children, with many delivered in the school setting. Although this is likely to be an appropriate age to prevent the onset of depressive disorders, which have a mean onset in the
mid teens (Hankin, Abramson, Silva, McGee, & Moffitt, 1998), it may be a little late for
optimal prevention of anxiety disorders which are often first seen in childhood (Rapee,
Schniering, & Hudson, 2009). Some evidence has shown that programs for anxiety aimed at
younger children show stronger effects than those aimed at older children (Neil &
Christensen, 2009; Teubert & Pinquart, 2011), suggesting that prevention may be more
effectively targeted at earlier ages.

Probably the main limitation within the mental health prevention literature, identified
by a number of authors, is the lack of extensive follow-up data (Fisak et al., 2011; Gillham,
Shatte, & Reivich, 2001; Greenberg, Domitrovich, & Bumbarger, 2001; Teubert & Pinquart,
2011). Theoretically, it may be predicted that the effects of prevention programs will actually
increase over time (sleeper effects) due to interactions between agent and environment in the
development of disorder (Garber, 2006; Perez-Edgar & Fox, 2005; Rapee et al., 2009).
Empirically, some evidence has supported increased effects over time, although this has
primarily been shown for externalising disorders (Greenberg et al., 2001). Effects following
interventions for internalising disorders have been shown at best to maintain, or in some
cases to decrease, over the following 6 to 12 months (Fisak et al., 2011; Merry et al., 2011;
Teubert & Pinquart, 2011). Most importantly, where follow-up of prevention for anxiety and
depression has been evaluated, it has typically been up to 12 months. Follow-up data
spanning several years is almost non-existent. In the only study to date examining the effects
of a program delivered at a very young age on depression in early adulthood, evidence was
found for a preventative effect (McLaughlin, Campbell, Pungello, & Skinner, 2007).
Therefore it is possible that early programs aimed at preventing internalising disorders may
have very long term effects.

Several years ago, we developed a program aimed at preventing the development of
internalising disorders (especially anxiety) beginning with children from a very young
(preschool) age in order to precede the development of most anxiety disorders (Rapee, Kennedy, Ingram, Edwards, & Sweeney, 2005). The program, *Cool Little Kids*, was one of the few utilising indicated delivery (i.e. aimed at risk for disorder). Children were selected for inclusion if they showed high levels of inhibited and withdrawn behaviours since childhood inhibition has been shown to be a key risk for both later anxiety and mood disorders (G. L. Gladstone & Parker, 2006; Perez-Edgar & Fox, 2005; Rapee et al., 2009). Given the very young age of the children and evidence for the importance of parents in the development of anxiety and depression (Garber, 2005; Rapee et al., 2009), the program was delivered to parents. In order to minimise costs and increase the likelihood of uptake by both parents and policy makers, the program was designed to be especially brief (6 sessions) and sessions were delivered in groups.

Initial results were promising, with significantly fewer anxiety disorders at 12 months follow-up among children whose parents received the intervention than those in an assessment-only control group (Rapee et al., 2005). Over the following two years, children whose parents had received the intervention continued to demonstrate fewer anxiety disorders and also showed lower levels of anxiety symptomatology (Rapee, Kennedy, Ingram, Edwards, & Sweeney, 2010).

The results of these early evaluations were very promising. An evaluation showed that the effects to age 7 were highly cost effective (Mihalopoulos, Vos, Rapee, Pirkis, & Carter, 2012). However, given that children with anxiety disorders continue to remain at high risk for further anxiety disorders and for the development of depressive disorders (Costello, Egger, & Angold, 2005; Pine, Cohen, Gurley, Brook, & Ma, 1998), evaluation of preventive effects into adolescence is of particular importance. The current report describes the results of an 11-year follow-up of this sample who were initially assessed at preschool age. This represents by far the longest follow-up of a prevention program for anxiety to date. The children in this
cohort now average around 15 years of age and this places them above the mean ages of onset for social phobia and generalised anxiety disorder (Kessler, Berglund, Demler, Jin, & Walters, 2005) and around the age when the dramatic increase in prevalence of depression is typically noted (Hankin et al., 1998).

Method

Participants

Participants for the study were 103 adolescents whose parents had originally been involved in an early intervention for children at risk for internalising distress (Rapee et al., 2005). Children were initially selected for the trial if they were aged between 3 and 5 years, screened high on a maternal report measure of temperamental inhibition, and demonstrated behavioural inhibition on a laboratory observation. The current assessment was conducted approximately 11 years after initial recruitment.

Recruitment for the current study was a key priority and all attempts were made to contact the original families. Addresses for a relative had been obtained in the initial trial and regular contact had been maintained with most families for three years (see Rapee et al., 2010). For those families who were not located from these sources, a number of strategies were used to locate them including searching electoral rolls, searching telephone directories across Australia, calling the original daycare, contacting fathers' work addresses, and contacting neighbours. These strategies allowed us to locate 116 of the original 146 participants (79%). Of the located participants, 12 refused participation or did not return data and one was deceased. This left a total of 103 participants (71% of the original sample) who returned data for the current study.

The sample comprised 49 participants from those whose parents had initially been allocated to the parent education condition (intervention) and 54 whose parents had been
allocated to a no intervention condition (control). The sample had a mean age of 15.4 years (s.d. = 0.6) and there were 62 girls and 41 boys.

**Intervention**

The original parent intervention involved 6, 90-minute, group sessions that were conducted by clinical psychologists with experience in running treatments for anxious children. The program, called *Cool Little Kids*, primarily focussed on the following strategies: 1. Psychoeducation about the nature, development and risks for internalising disorders, 2. Reduction of parental overprotection and anxiety and encouragement of child independence, 3. Systematic techniques to encourage in vivo exposure for the child. Parents were encouraged to continue to apply these techniques as the child matured and especially during "high risk" times (such as the start of school).

**Measures**

**Diagnoses:** Current diagnoses were assigned by clinical psychologists following structured interview with the Anxiety Disorders Interview Schedule for DSM-IV, Parent and Child versions (ADIS-C)(Silverman & Albano, 1996). Interviewers received training to criterion and research from our clinic has demonstrated inter-rater agreement of kappa = 1.00 for an overall diagnosis of anxiety disorder, and ranging from .68 to .93 across the major anxiety disorders (Lyneham, Abbott, & Rapee, 2007). Diagnoses were based on composite parent and child report. For the current study current diagnoses of any of the anxiety disorders and depressive disorders were relevant.

All interviews were recorded and a subset (N=20, 19%) rated by a second clinician. Diagnostic agreement for identification of an anxiety or depressive disorder was kappa = .79, and the correlation between raters on the total number of identified internalising disorders was .90.
In the original sample (aged 3-5 years) diagnostic interviews had also been made based on the ADIS-C according to interviews with mothers. Kappas at that stage ranged from .77 to .86 for the specific anxiety disorders. The total number of anxiety disorders at baseline was used in the current analyses as a covariate.

Assessment of symptoms: Symptoms of anxiety were measured with the Spence Children’s Anxiety Scale, child and parent versions (SCAS; SCASp) (Nauta, Scholing, Rapee, Abbott, & Spence, 2004; Spence, 1998). Symptoms of depression were measured with the Short Moods and Feelings Questionnaire, child and parent versions (SMFQ, SMFQp) (Angold et al., 1995).

Negative thinking: Adolescents completed the Children’s Automatic Thoughts Scale (CATS) (Schniering & Rapee, 2002), a measure of children’s negative thoughts and beliefs. This measure incorporates four subscales assessing thoughts related to social threat, physical threat, failure/loss, and hostility. For the current study a composite scale of negative threat beliefs was created by summing items on the physical threat and social threat subscales, which correlated strongly in this sample (r = .69). The hostility subscale is not relevant to this study and is not reported.

Life interference: Interference in life as a function of anxiety symptoms was assessed using the Child Anxiety Life Interference Scale (CALIS) parent and child versions (Lyneham, Abbott, Rapee, Tolin, & Carlson, 2012). The CALIS contains nine items that assess the extent to which symptoms of anxiety affect a child's life across a variety of domains such as school, social life, and family functioning. Parents and children complete parallel items relevant to interference in the child's life.

Inhibition at age 4: At initial entry to the study (ages 3-5), children were assessed with a measure of temperamental inhibition, the Social Inhibition scale of the Temperament Assessment Battery for Children Revised (TABCR) (Presley & Martin, 1994).
Prior Treatment: Parents were asked to indicate whether their child had seen any of a list of 6 professionals for a mental health issue (e.g., psychologist, psychiatrist, paediatrician). They were also asked whether their child currently takes any medication for anxiety or depression. Only one child (a boy in the control group) was on medication and therefore this variable will not be reported further.

Procedure

Participants were contacted and asked for their willingness to engage in a single assessment session of approximately 2-3 hours involving personal interviews and completion of questionnaires. Participation was sought from the target adolescent and their mother who were offered $A100 as reimbursement for their time. Mothers were selected to maintain consistent parent gender and since they were more likely than fathers to provide data and to have been the primary caregiver. Where mothers were not available, a father or alternate caregiver would have been acceptable, but this was not required for any family.

Families who agreed to participate were sent a secure weblink to complete the questionnaires online and an appointment was made at the university for diagnostic assessment. The assessing clinicians were blind to the condition to which the parent had originally been assigned. Where diagnoses were identified or marked distress was apparent, families were offered referral options. This study was approved by the Macquarie University Human Research Ethics Committee.

Data analysis

Categorical data were compared using chi-square and continuous data were compared using analyses of covariance (ANCOVA). Because of the marked gender differences in anxiety and depression by the teenage years and some evidence indicating gender differences
in response to prevention for depression (Horowitz & Garber, 2006; Stice et al., 2009),
gender was included as an additional factor in all analyses. Because of the low numbers,
especially of males, group by gender interactions were followed up if they fell below \( p=.1 \).
Finally, in order to account for any minor pre-existing differences, the total number of
anxiety disorders at baseline (age 3-5) and maternal reported inhibition at baseline (age 3-5)
were entered as covariates into all analyses.

Results

Representativeness of obtained sample

Because it was not possible to obtain current data from all original participants,
participants who provided data at this 11 year follow-up were compared with participants
who did not provide data on features when they originally entered the study (age 3-5).
Twenty-three of the original 73 participants (32%) in the intervention group could not be
assessed and 20 of the original 73 participants (27%) in the control group could not be
assessed. This difference was not significant, \( \chi^2 (1, N=146) = 0.43, p=.515 \).

Comparisons were made on two key variables at baseline (age 3-5): inhibition as
reported by mothers on the TABCR and number of anxiety disorders based on structured
diagnostic interview. There was no significant difference on baseline inhibition between
those who were followed up and those who were not, \( F(1,125) = 0.25, p=.621, \mu_p^2 = .002 \),
and neither were there significant interactions between follow-up and group, \( F(1,125) = 0.16, p=.693, \mu_p^2 = .001 \), follow-up and gender, \( F(1,125) = 1.92, p=.168, \mu_p^2 = .015 \), or follow-up,
group and gender, \( F(1,125) = 0.29, p=.590, \mu_p^2 = .002 \). Similarly there was no significant
main effect of follow-up access on the total number of anxiety disorders at baseline, \( F(1,136) = 0.97, p=.328, \mu_p^2 = .007 \), nor were there significant interactions between follow-up and
group, $F(1,136) = 0.34, p=.563, \mu_p^2 = .002$, follow-up and gender, $F(1,136) = 0.15, p=.695$, 
$\mu_p^2 = .001$, or follow-up, group and gender, $F(1,136) = 0.09, p=.761, \mu_p^2 = .001$.

Those who attended the 11-year follow-up also did not differ significantly from those who did not on age at baseline, $F(1,138) = 0.72, p=.399, \mu_p^2 = .005$, and neither were there significant interactions between follow-up and group, $F(1,138) = 0.11, p=.737, \mu_p^2 = .001$, follow-up and gender, $F(1,138) = 0.26, p=.610, \mu_p^2 = .002$, or follow-up, group and gender, $F(1,138) = 1.09, p=.299, \mu_p^2 = .008$. However, girls were more likely to attend follow-up than were boys (78% girls followed-up vs 62% boys), $\chi^2 (1, N=146) = 4.12, p=.042$. This difference was significant within the control condition (84% girls followed-up vs 62% boys), $\chi^2 (1, N=74) = 4.39, p=.036$, but not within the intervention condition (72% girls followed-up vs 62% boys), $\chi^2 (1, N=72) = 0.80, p=.371$.

Demographic comparison

The two groups were compared on current demographic factors (see table 1). There were 31 females (63.3%) in the intervention group and 31 (57.4%) in the control group, a non-significant difference, $\chi^2 (1, N=103) = 0.37, p=.544$. The groups differed significantly on age - children in the intervention group were slightly older than children in the control, $F(1,99) = 5.45, p=.022, \mu_p^2 = .052$, although there was no significant group by gender interaction, $F(1,99) = 0.16, p=.686, \mu_p^2 = .002$. Other demographic factors did not differ significantly, although there were some trends approaching significance. Importantly, where differences were indicated, these were consistently in the direction suggesting worse demographic factors for children whose parents had gone through the intervention (i.e. they should predict more psychopathology) and hence were conservative with respect to hypotheses. Interestingly, the groups did not differ significantly on use of mental health professionals.
Effects on internalising problems at age 15

The two groups (by gender) were compared on the total number of anxiety and depressive (internalising) disorders at age 15 as assessed by structured diagnostic interview.

There was no significant difference between groups in the total number of internalising disorders, $F(1,97) = 1.96, p=.165, \mu^2 = .020$, however, the gender by group interaction approached traditional levels of significance, $F(1,97) = 3.27, p=.074, \mu^2 = .033$ (see table 2). Because of the marginally significant group by gender interaction, the two groups were compared within each gender separately. For boys, the group difference did not reach significance, $F(1,37) = 0.05, p=.818, \mu^2 = .001$. However, girls whose parents had been through the intervention showed significantly fewer internalising disorders than girls in the control condition, $F(1,58) = 4.42, p=.040, \mu^2 = .071$.

From a different perspective, among boys, 11 (47.8%) in the control condition met criteria for one or more anxiety disorders compared to 10 (55.6%) in the intervention condition, $\chi^2 (1, N=41) = 0.24, p=.623$, and 1 (4.3%) boy in the control condition met criteria for one or more depressive disorders compared to 2 (11.1%) in the intervention condition, $\chi^2 (1, N=41) = 0.68, p=.409$. In contrast, 19 (61.3%) girls in the control condition met criteria for one or more anxiety disorders compared to 12 (38.7%) girls in the intervention condition, $\chi^2 (1, N=62) = 3.16, p=.075$, and 5 (16.1%) girls in the control condition met criteria for one or more depressive disorders compared to none in the intervention condition, $\chi^2 (1, N=62) = 5.44, p=.020$. Data are presented in Figures 1 and 2.

The two groups were compared on both maternal and child reported symptoms of anxiety based on the SCAS (table 2). According to the SCASp (maternal report), adolescents in the intervention showed fewer symptoms of anxiety than those in the control, $F(1,97) = 5.83, p=.018, \mu^2 = .057$, and this group difference was qualified by a trend toward a
significant group by gender interaction, $F(1,97) = 2.80, p=.098, \mu_p^2 = .028$. Separate analyses for boys and girls failed to show a significant group difference for boys, $F(1,37) = 0.44, p=.511, \mu_p^2 = .012$, but showed a significant difference between groups for girls, $F(1,58) = 9.12, p=.004, \mu_p^2 = .136$.

According to adolescents' reports, those whose parents had received the intervention showed a trend to report fewer symptoms of anxiety than did those in the control, $F(1,97) = 3.80, p=.054, \mu_p^2 = .038$. The group by gender interaction was not significant, $F(1,97) = 1.08, p=.301, \mu_p^2 = .011$.

In contrast to anxiety, symptoms of depression did not show significant differences between groups according to either parent, $F(1,97) = 1.47, p=.228, \mu_p^2 = .015$, or adolescent, $F(1,97) = 1.03, p=.312, \mu_p^2 = .011$, report. Neither group by gender interaction was significant.

**Negative Thinking**

The groups were compared on their total scores on the CATS threat items. The groups did not differ significantly, $F(1,97) = 0.69, p=.408, \mu_p^2 = .007$, and there was no significant group by gender interaction, $F(1,97) = 0.87, p=.355, \mu_p^2 = .009$. On the CATS failure and loss subscale, there was a trend that approached traditional levels of significance for a lower score among adolescents whose parents had been through the intervention, $F(1, 97) = 3.52, p=.064, \mu_p^2 = .035$. The group by gender interaction was not significant, $F(1,97) = 1.44, p=.233, \mu_p^2 = .015$.

**Life interference**

According to maternal reports of life interference in the child's life, the groups did not differ significantly, $F(1,97) = 2.36, p=.128, \mu_p^2 = .024$ and the group by gender interaction
was also not significant, \( F(1,97) = 0.12, p=.726, \mu^2_p = .001 \). Similarly, the main effect difference between groups on life interference according to adolescents' self reports did not reach significance, \( F(1,97) = 1.26, p=.264, \mu^2_p = .013 \). However, there was a significant group by gender interaction, \( F(1,97) = 4.28, p=.041, \mu^2_p = .042 \). When boys in the two groups were compared on their self reported life interference, there was no significant group difference, \( F(1,37) = 0.17, p=.683, \mu^2_p = .005 \). However, girls whose parents had been through the intervention reported significantly lower life interference from anxiety than did girls in the control group, \( F(1,58) = 5.38, p=.024, \mu^2_p = .085 \).

**Discussion**

One of the key limitations to this study is the restricted sample size, especially when looking at each gender. Even though the sample was no smaller than many studies examining treatment outcomes, in the context of prevention, the sample allows limited firm conclusions of public health relevance. Hence the results need to be interpreted with this limitation in mind.

With this caveat in mind, it was impressive to note that adolescents whose parents had received a brief early intervention program when their children were in preschool continued to show better functioning on several variables some 11 years later compared with a control group who received no intervention. Interestingly, this difference was most readily apparent among girls. The group means for girls consistently suggested better functioning among those whose parents received the intervention with mostly moderate to large effects. Statistically, girls in the intervention group were less likely to demonstrate internalising disorders and reported fewer symptoms of anxiety and life interference caused by anxiety. Although some variables (such as maternal reports of anxiety symptoms and adolescents' reports of negative beliefs related to failure and loss) showed main effect differences between groups and failed
to show significant interactions with gender, overall, boys showed a more inconsistent pattern of results and did not independently demonstrate any significant group differences. Clearly, power to detect significance was especially low for boys and this may be one reason for the lack of statistical significance. However, the pattern of means for boys and girls was different and group difference effect sizes among boys were consistently smaller than they were for girls. Research has consistently supported a gender imbalance among internalising disorders, and the female preponderance in depression in particular becomes marked around puberty (Hankin et al., 1998). Therefore it is possible that prevention effects following puberty are more readily demonstrable among girls due to their greater variability in internalising. Once again, the pattern of means supports this interpretation since boys failed to show especially high scores on most measures whereas it was girls in the control condition who showed clear elevations. This pattern is consistent with a prevention effect.

Of particular interest was the suggestion among the data that the program was able to prevent depression among girls in the adolescent years. As mentioned above, the onset of depression increases most typically following puberty. Hence our earlier evaluations of this sample did not evaluate depression and it is very unlikely that any of the children would have been depressed when they entered the study at age 4. Although the absolute number of depressed adolescents in the current sample was not large, girls in the control condition were more likely to develop a depressive disorder than girls whose parents received the intervention. The sample also showed a trend to report fewer depression-relevant negative thoughts (Schniering & Rapee, 2002). Prevention of teenage depression has been especially difficult (Spence & Shortt, 2007) and although the effects of school-based interventions for older children show some promise, effects are not large. The potential to prevent both anxiety and depression using a very brief and very early intervention has tremendous importance
given the continuing nature of teenage depression and the high personal and societal impact of depressive disorders across the lifespan (Pine et al., 1998).

As a prevention program, the core aim is to reduce the frequency of clinical diagnoses along the life course. As mentioned, girls whose parents had been through the early program were significantly less likely to demonstrate a current internalising disorder than were controls. We decided to assess only a snapshot of current psychological functioning both due to its greater accuracy and to minimise time burden on participants and maximise participation. Had we retrospectively assessed internalising disorders from age 7 (the previous assessment of this sample) to age 15, it is very possible that effects would have been stronger. Nevertheless, the lack of information on disorders between the ages of 7 and 15 is a limitation that needs to be acknowledged. Nonetheless, based on the current clinical status data, the number needed to treat to prevent an internalising disorder among girls was less than 4. In other words, relative to girls whose parents do not participate in an educational program, for every 4 girls whose parents participate in this brief early intervention, one additional girl will be free of anxiety or depressive disorders by age 15. This effect compares extremely favourably with the average number needed to treat for the prevention of cases of depression using programs delivered at later ages (N=22) (Cuijpers et al., 2008).

Although the groups did not differ significantly on the number of professionals seen it is not clear how to interpret the lack of difference. On the one hand, seeking treatment implies that the young people were having significant difficulties and had not been prevented from disorder. On the other hand, an important outcome of early intervention may be to increase awareness, decrease stigma, and improve pathways to care - in other words, increased treatment-seeking may be a positive outcome. In addition to these contradictory predictions, this effect is further complicated by the knowledge that seeking treatment is only minimally related to the existence of a clinical disorder (Angold, Costello, Farmer, Burns, &
Erkanli, 1999; Sawyer & Patton, 2000). Thus, it is not clear what to make of the lack of significant difference in treatment-seeking. In addition the measurement of this variable was probably relatively imprecise since it was based on retrospective maternal reports. Treatment-seeking has important implications for the cost-effectiveness of prevention programs and future evaluations would be improved by including a more objective assessment of this variable by accessing health records.

A limitation related to the original study is that the participants were likely to be more highly motivated than would be found in a typical cross-section of the population. A proportion of the original parents volunteered for the study after hearing about it through word of mouth and even those who were recruited through screening had more personal attention than would be found in community settings. In a current extension of the Cool Little Kids program to community delivery (Bayer et al., 2011), recruitment rates do not appear to be as high as they were in the original sample and it is possible that effects will be smaller. The implications are that the effects demonstrated here may be restricted to a highly motivated subsample of parents. This does not undermine the effects for this group, but may indicate limitations to the generalisation of results.

In summary, this program which represents one of the longest evaluations of an early intervention program for internalising distress has shown some very promising effects. Girls whose parents received the early intervention continued to show marked benefits during their middle adolescent years. These benefits should continue to stand them in good stead as they enter early adulthood. The effects were less clear for boys who showed relatively low distress regardless of intervention. It is possible that early intervention for internalising is not effective for boys, that different programs are needed, or that effects are smaller and require larger samples. Given the brevity and the very low costs of this intervention, even quite small effects will have major benefits to public health.
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Key Points:

- Withdrawn and inhibited behaviours in early childhood are one of the most consistent risk factors for later anxiety and depression.

- Some earlier research has shown that it is possible to intervene with shy and withdrawn preschool-aged children to prevent later internalising disorders.

- The current study showed that a brief educational intervention delivered to the parents of preschool-aged inhibited children could reduce anxiety and depression in the teenage years.

- However, this preventative effect was only apparent for girls and not for boys.

- These results show that building coping skills in young, withdrawn children can have long-term positive effects on later distress, especially for girls.
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Table 1. Comparison between groups and genders on demographic and baseline factors.

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<tr>
<td>Age in years (mean &amp; s.d.)</td>
<td>15.6 (0.8)</td>
<td>15.6 (0.4)</td>
<td>15.3 (0.7)</td>
</tr>
<tr>
<td>Maternal education (% tertiary)</td>
<td>38.9</td>
<td>53.8</td>
<td>56.5</td>
</tr>
<tr>
<td>Mothers not married (%)</td>
<td>16.7</td>
<td>25.9</td>
<td>8.7</td>
</tr>
<tr>
<td>Two-parent family (%)</td>
<td>83.3</td>
<td>74.1</td>
<td>91.3</td>
</tr>
<tr>
<td>N of anxiety disorders at baseline (mean &amp; s.d.)</td>
<td>1.8 (0.9)</td>
<td>2.1 (1.2)</td>
<td>1.9 (1.1)</td>
</tr>
<tr>
<td>Maternal reported inhibition at baseline (mean &amp; s.d.)</td>
<td>47.4 (4.3)</td>
<td>48.4 (6.0)</td>
<td>45.4 (7.2)</td>
</tr>
<tr>
<td>Number of mental health professionals seen (mean &amp; s.d.)</td>
<td>0.68 (.27)</td>
<td>0.43 (.20)</td>
<td>1.17 (.24)</td>
</tr>
</tbody>
</table>
Table 2: Comparison between adolescents in the intervention and control conditions on outcome variables.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Boys</th>
<th>Intervention</th>
<th>Control</th>
<th>Effect size&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Girls</th>
<th>Intervention</th>
<th>Control</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of internalising disorders</td>
<td></td>
<td>0.85 (0.32)</td>
<td>0.77 (0.28)</td>
<td>-0.06</td>
<td>0.79 (0.24)</td>
<td>1.53 (0.24)</td>
<td>0.55</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.94 (1.06)</td>
<td>0.83 (1.07)</td>
<td>-0.19</td>
<td>0.84 (1.46)</td>
<td>1.68 (1.89)</td>
<td>0.50</td>
<td></td>
</tr>
<tr>
<td>Spence Children's Anxiety Scale - maternal report</td>
<td></td>
<td>10.06 (2.36)</td>
<td>11.62 (2.10)</td>
<td>0.15</td>
<td>9.96 (1.82)</td>
<td>18.32 (1.81)</td>
<td>0.83</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10.11 (5.77)</td>
<td>11.39 (10.20)</td>
<td>0.20</td>
<td>10.55 (8.93)</td>
<td>17.87 (12.89)</td>
<td>0.67</td>
<td></td>
</tr>
<tr>
<td>Spence Children's Anxiety Scale - child report</td>
<td></td>
<td>14.55 (2.90)</td>
<td>16.87 (2.58)</td>
<td>0.19</td>
<td>16.50 (2.23)</td>
<td>24.02 (2.22)</td>
<td>0.61</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>14.67 (12.13)</td>
<td>16.57 (6.11)</td>
<td>0.21</td>
<td>16.97 (11.92)</td>
<td>23.71 (15.64)</td>
<td>0.49</td>
<td></td>
</tr>
<tr>
<td>Short Moods and Feelings Questionnaire - maternal report</td>
<td></td>
<td>2.66 (0.93)</td>
<td>2.83 (0.83)</td>
<td>0.04</td>
<td>1.72 (0.71)</td>
<td>3.51 (0.71)</td>
<td>0.45</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.67 (4.65)</td>
<td>2.78 (4.26)</td>
<td>0.03</td>
<td>1.90 (3.08)</td>
<td>3.35 (4.12)</td>
<td>0.40</td>
<td></td>
</tr>
<tr>
<td>Short Moods and Feelings Questionnaire - child report</td>
<td></td>
<td>3.84 (1.23)</td>
<td>3.48 (1.09)</td>
<td>-0.07</td>
<td>3.97 (0.95)</td>
<td>6.51 (0.94)</td>
<td>0.48</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.83 (5.14)</td>
<td>3.48 (3.74)</td>
<td>-0.08</td>
<td>4.06 (5.49)</td>
<td>6.42 (5.76)</td>
<td>0.42</td>
<td></td>
</tr>
<tr>
<td>Child Anxiety Life Interference Scale - maternal report</td>
<td></td>
<td>7.09 (1.76)</td>
<td>8.92 (1.57)</td>
<td>0.24</td>
<td>4.66 (1.36)</td>
<td>7.55 (1.35)</td>
<td>0.38</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.11 (6.22)</td>
<td>8.83 (9.70)</td>
<td>0.22</td>
<td>4.90 (6.67)</td>
<td>7.35 (6.70)</td>
<td>0.37</td>
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</tr>
</tbody>
</table>
### Child Anxiety Life Interference Scale - child report

<table>
<thead>
<tr>
<th></th>
<th>Mean (SD)</th>
<th>Mean (SD)</th>
<th>Effect Size</th>
<th>Mean (SD)</th>
<th>Mean (SD)</th>
<th>Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6.20 (1.46)</td>
<td>5.03 (1.30)</td>
<td>-.19</td>
<td>4.84 (1.12)</td>
<td>8.86 (1.12)</td>
<td>.64</td>
</tr>
<tr>
<td></td>
<td>6.22 (7.42)</td>
<td>4.96 (4.56)</td>
<td>-.21</td>
<td>5.03 (5.69)</td>
<td>8.71 (6.80)</td>
<td>.59</td>
</tr>
</tbody>
</table>

### Children's Automatic Thoughts Scale - threat

<table>
<thead>
<tr>
<th></th>
<th>Mean (SD)</th>
<th>Mean (SD)</th>
<th>Effect Size</th>
<th>Mean (SD)</th>
<th>Mean (SD)</th>
<th>Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5.12 (3.19)</td>
<td>4.88 (2.84)</td>
<td>-.02</td>
<td>9.05 (2.45)</td>
<td>13.91 (2.44)</td>
<td>.36</td>
</tr>
<tr>
<td></td>
<td>5.17 (7.80)</td>
<td>4.74 (6.64)</td>
<td>-.06</td>
<td>9.32 (13.12)</td>
<td>13.71 (18.76)</td>
<td>.28</td>
</tr>
</tbody>
</table>

### Children's Automatic Thoughts Scale - failure/loss

<table>
<thead>
<tr>
<th></th>
<th>Mean (SD)</th>
<th>Mean (SD)</th>
<th>Effect Size</th>
<th>Mean (SD)</th>
<th>Mean (SD)</th>
<th>Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.58 (1.68)</td>
<td>2.59 (1.50)</td>
<td>.14</td>
<td>2.92 (1.29)</td>
<td>7.40 (1.29)</td>
<td>.63</td>
</tr>
<tr>
<td></td>
<td>1.61 (3.53)</td>
<td>2.52 (4.40)</td>
<td>.23</td>
<td>2.97 (4.81)</td>
<td>7.39 (10.95)</td>
<td>.56</td>
</tr>
</tbody>
</table>

Note: Top line for each variable reports estimated marginal means (and standard errors in parentheses) including baseline anxiety disorders and inhibition as covariates. Lower line within each variable reports raw means (and standard deviations).

a: Effect sizes reflect the difference between the two groups within each gender, expressed as Cohen’s d.
Figure 1: Percentage of adolescents with a current anxiety disorder in the two groups.
Figure 2: Percentage of adolescents with a current depressive disorder in the two groups.