The effect of targeting tolerance of children's negative emotions among anxious parents of children with anxiety disorders: a pilot randomised controlled trial
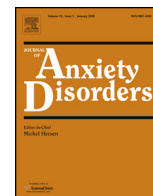
the End User Agreement.

www.reading.ac.uk/centaur

CentAUR

Central Archive at the University of Reading

Reading's research outputs online

The effect of targeting tolerance of children's negative emotions among anxious parents of children with anxiety disorders: A pilot randomised controlled trial

Rachel M Hiller [a], Adela Apetroaia [b], Kiri Clarke [b], Zoe Hughes [b], Faith Orchard [b], Monika Parkinson [b], Cathy Creswell [b,*]

[a] Department of Psychology, University of Bath, Claverton Down, Bath, BA2 7AY, UK
[b] School of Psychology and Clinical Language Science, University of Reading, Reading, RG6 6AY, UK

ABSTRACT

Following cognitive behavioural therapy for child anxiety a significant minority of children fail to lose their diagnosis status. One potential barrier is high parental anxiety. We designed a pilot RCT to test claims that parental intolerance of the child's negative emotions may impact treatment outcomes. Parents of 60 children with an anxiety disorder, who were themselves highly anxious, received either brief parent-delivered treatment for child anxiety or the same treatment with strategies specifically targeting parental tolerance of their child's negative emotions. Consistent with predictions, parental tolerance of the child's negative emotions significantly improved from pre- to post-treatment. However, there was no evidence to inform the direction of this association as improvements were substantial in both groups. Moreover, while there were significant improvements in child anxiety in both conditions, there was little evidence that this was associated with the improvement in parental tolerance. Nevertheless, findings provide important clinical insight, including that parent-led treatments are appropriate even when the parent is highly anxious and that it may not be necessary to adjust interventions for many families.

1. Introduction

Anxiety disorders are among the most common psychological disorders in childhood, affecting up to five percent of children under 12 years of age (Costello, Egger, & Angold, 2005; Ford, Goodman, & Meltzer, 2003). They are associated with numerous adverse consequences, including effects on the child's social and educational functioning (Essau, Conradt, & Petermann, 2000), are associated with the development of other disorders in childhood (e.g., depression, conduct disorder) and place children at increased risk for other psychiatric disorders in adolescence and adulthood (Bittner et al., 2007). As a result, these disorders carry a substantial health and social cost (Bodden, Dirksen, & Bogels, 2008).

Robust evidence has demonstrated the effectiveness of cognitive behaviour therapy (CBT) for a range of childhood anxiety disorders. While results vary between studies, findings typically demonstrate that 50–60% of children will lose their anxiety diagnosis status following CBT (e.g., James, James, Cowdrey, Soler, & Choke, 2013). However, this also means a significant proportion of children fail to lose their primary anxiety diagnosis following a course of CBT. Consequently, it has been suggested that research begins to focus on tailoring treatment to target groups where we may expect less successful outcomes (Compton et al., 2014). One subgroup identified as potentially being at greater risk of failing to make clinical gains through CBT is children of parents who are themselves highly anxious (Breinholst, Esbjørn, Reinholdt-Dunne, & Stallard, 2012; Reynolds, Wilson, Austin, & Hooper, 2012). Although findings are inconsistent when parental anxiety is considered as a continuous measure (e.g. Lundkvist-Houndoumadi, Hougaard, & Thastum, 2014), there is consistent evidence of poorer treatment outcomes for children whose parents report clinical levels of trait anxiety (at least in terms of the short term child outcomes, e.g. Cobham, Dadds, & Spence, 1998) or a current anxiety disorder (e.g. Bodden, Dirksen, & Bögels, 2008; Hudson et al., 2014). It has been hypothesised that this failure to make optimal treatment gains may be partially due to highly anxious parents responding to their child's anxiety in a manner that inadvertently maintains the disorder and runs contrary to the principles of CBT (Hudson & Rapee, 2001; Hudson,

Comer, & Kendall, 2008; Murray, Creswell, & Cooper, 2009; Storch et al., 2015). In support of this model, compared to non-anxious parents, highly anxious parents of children with anxiety disorders report more negative expectations of their child's responses (Cobham et al., 1998; Creswell, Apetroaia, Murray, & Cooper, 2012) and have been observed to be more intrusive, to express more anxiety and catastrophic comments, and to have a poorer quality relationship with their child, when interacting under stressful conditions (Creswell et al., 2012; Moore, Whaley, & Sigman, 2004); behaviours which are hypothesised to have potentially anxiogenic effects (e.g. Wood, McLeod, Sigman, Hwang, & Chu, 2003; Thirlwall & Creswell, 2010; Gerull & Rapee, 2002). These findings are consistent with the suggestion that parents who are highly anxious may have a limited ability to tolerate their child's distress, and that this may lead to anxiogenic parental behaviours that may interfere with treatment (Creswell et al., 2012; Tiwari et al., 2008).

The key aim of this research was to provide the first test of the directional relationship between tolerance of child distress, parent responses to children in anxiety-provoking situations and child treatment outcomes, in the context of child anxiety disorders and high parental anxiety. We did this by examining the effects of an adjunct intervention to target parental tolerance of children's negative emotions (i.e., anxiety) on changes in (i) parental behavioural responses to their child, and (ii) child anxiety disorder and symptoms.

A number of critical methodological factors were taken in to account. Parent responses change to some degree in response to child symptom change when children receive CBT (e.g. Silverman, Kurtines, Jaccard, & Pina, 2009; Creswell, Waite, & Cooper, 2014). We, therefore, used a brief parent-delivered treatment for child anxiety disorders as our basic treatment as, in this context, treatment delivery is entirely reliant on parents putting strategies in to place outside of treatment sessions (e.g. Thirlwall et al., 2013; Cobham, 2012; Lyneham & Rapee, 2006). Recent evidence suggests parent-delivered CBT is an effective treatment for child anxiety (Chavira et al., 2014; Lebowitz et al., 2014; Leong, Cobham, De Groot, & McDermott, 2009; Smith, Flannery-Schroeder, Gorman, & Cook, 2014) and some studies have reported similar outcomes to CBT programmes that are delivered directly to children and to both parents and/or children (e.g., Chavira et al., 2014; Nauta, Scholing, Emmelkamp, & Minderaa, 2003). However, it is generally hypothesised that parent-delivered programs are less suitable in the context of the parent themselves experiencing high anxiety (Chavira et al., 2014; Creswell et al., 2010). Therefore, by focussing solely on parent-delivered conditions we were able to examine outcomes from this approach in the context of high parent anxiety. Finally, we also included observational measures of parental behaviours pre- and post-treatment to overcome the potential impact of the intervention on *perceptions* of parental responses.

The following hypotheses were examined among parent-child dyads in which all children met criteria for a current anxiety disorder and all parents were rated as 'highly anxious': (1) specifically targeting, and thus improving, parental tolerance of children's negative emotions will be associated with an increase in positive parent-child interactions (more positive relationship quality, less intrusiveness and expressed anxiety), and that (2) changes in tolerance will be associated with better child treatment outcomes.

2. Method

2.1. Participants

A power analysis was conducted to determine the number of participants needed to address the primary hypothesis based on a repeated measures ANOVA for within-between interaction with two groups. To achieve a power of 0.90 ($\alpha=0.05$) with a medium effect size ($f=0.25$), a total sample size of 46 was required to detect a significant effect. As such we recruited a total of 60 participants to allow for 20% drop out.

Two-hundred and seventy-two potential participants were assessed for eligibility, from consecutive referrals by health or educational professionals to the Berkshire Child Anxiety Clinic at the University of Reading. From these, 212 potential participants were excluded (78%), primarily because they were not deemed eligible ($n=186$; see Fig. 1), in most cases because the primary caregiving parent was not highly anxious ($n=136$). Sixty participants were randomised to a treatment condition. Forty-six of these participants were mothers, three were fathers and for 10 cases both the mother and father participated in at least some sessions (1 parent did not start treatment). Thirty-two participants were randomised in to the novel treatment condition and 28 were in the control treatment condition. Of these participants, 22 in the novel treatment condition and 23 in the control treatment condition completed the post-treatment assessment (see Fig. 1).

The parent was eligible if (a) they had a child who was aged between 7 and 12 years old who met criteria for a primary diagnosis of a DSM-IV-TR anxiety disorder; and (b) if they were the primary carer, and themselves experienced high anxiety. Exclusion criteria were (i) significant physical or intellectual impairment, (ii) current prescription of psychotropic medication for the child or parent that had not been at a stable dose for at least one month and without agreement to maintain that dose throughout the study, and (iii) the parent's anxiety disorder was at a severity level that required immediate treatment outside of this trial. High parental anxiety was determined on the basis that the parent either (i) scored at a moderate level or above (≥ 10) on the anxiety subscale of the 21-item version of the Depression, Anxiety and Stress Scale (DASS-A; Lovibond & Lovibond, 1995), or (ii) met criteria for a current anxiety disorder on the basis of the ADIS-Adult Interview (Brown, DiNardo, Barlow, & DiNardo, 1994). The ADIS was administered if parents did not score above the cut-off on the DASS-A but did endorse having significant difficulties relating to anxiety. Thirty-three parents were included on the basis of scoring above the clinical cut-off on the DASS-A and 27 parents were included on the basis of meeting diagnostic criteria for a current anxiety disorder.

2.2. Procedure

The study was approved by the University of Reading Research Ethics Committee and the National Research Ethics Service South Central Oxford B Committee. After confirmation of eligibility, parents were randomly allocated to: (i) Brief Guided Parent Delivered CBT (GPD-CBT) for child anxiety disorders, or (ii) GPD-CBT incorporating novel strategies designed to improve parental tolerance of children's emotions (TCNE). Randomisation was based on random number generation conducted independently at a 1:1 ratio.

Regardless of condition all parents received a self-help book (Creswell & Willets, 2012) and eight sessions of therapist support (six face-to-face treatment sessions [45–60 mins] and two telephone review sessions [approx. 15 mins]), delivered on a weekly or fortnightly basis. Treatment in both conditions was delivered by a trained therapist, primarily at the University clinic.[1] Each treatment condition used a highly structured manual, with frequent group supervision of recorded sessions to ensure treatment integrity. During the session parents were coached in delivering CBT strategies with their child to implement between sessions and review in subsequent sessions. Parents and children were assessed

---

[1] In rare one-off cases a session may have been delivered in the parent's home, if they were unable to attend the clinic.
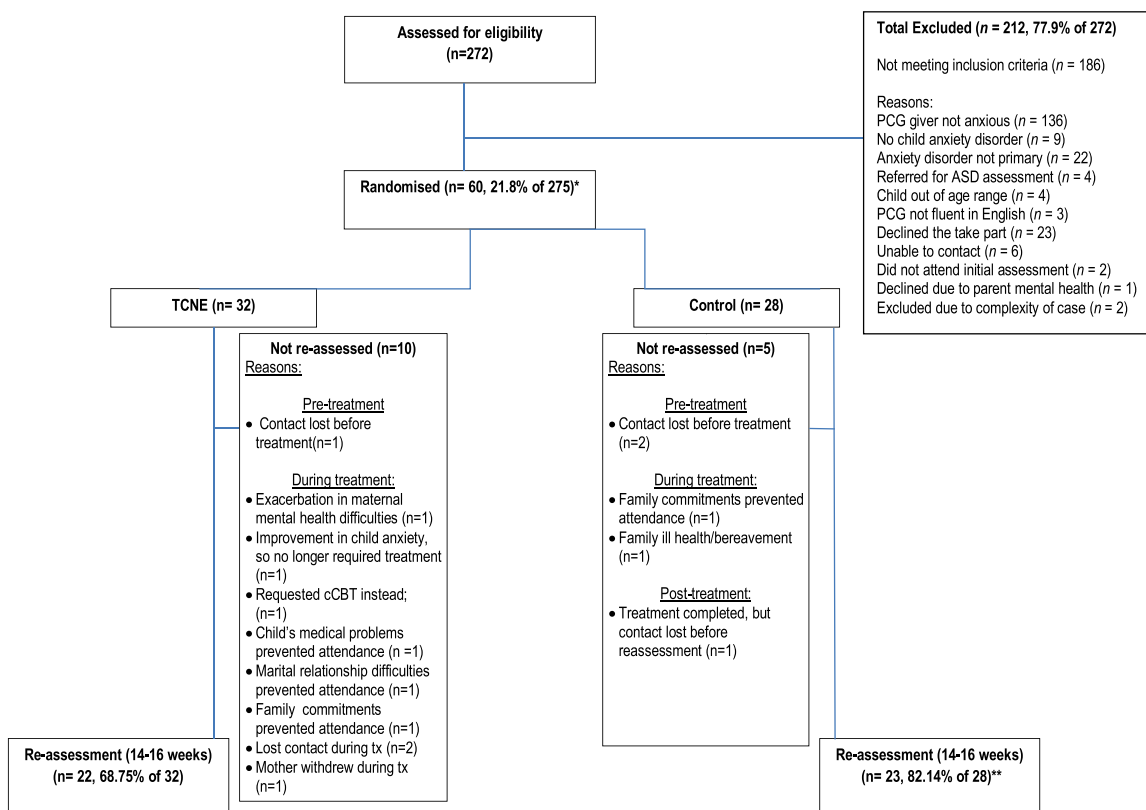
Fig. 1. Flow chart of recruitment.
Note: PCG (Primary caregiver); ASD (autism spectrum disorder); cCBT (child-led CBT).
[*]Of the 60 participants randomised, 59 (98.3%) completed the lab research assessment pre-treatment. The remaining participant consented but did not participate any further.
[**]Of the 23 control participants completing the re-assessment, 20 (87%) completed the additional lab research assessment post treatment.

on all measures at two time points: pre-treatment (time 1) and post-treatment (time 2; approximately 14–16 weeks after the initial assessment).

2.3. Treatment

2.3.1. GPD-CBT

Parents randomised to the control condition received 8 sessions of guided parent-directed CBT for child anxiety based on Thirlwall et al. (2013), but delivered over two additional face-to-face sessions (to allow time to include additional elements in the TCNE condition). Key elements of this manualised treatment are understanding anxiety, identifying the child's anxious thoughts, exposure, and problem solving.[2]

2.3.2. TCNE

Parents randomised to the TCNE condition received the GPD-CBT intervention, with additional strategies that specifically aimed at promoting parental tolerance of the child's negative emotions. The GPD-CBT program was delivered in the same order as the control treatment, meaning key strategies (e.g., exposure) were delivered at the same sessions, but TCNE strategies were integrated throughout (in GPD-CBT the time was used for more extensive review of the application of the more limited set of strategies). Parents in the TCNE condition were encouraged to identify their own emotional responses to their child's distress and identify potential maintaining cycles, and to monitor and regulate those emotional

responses through a combination of cognitive and mindfulness based techniques based on existing interventions for adult anxiety disorders i.e., emotion regulation psychotherapy (Leahy, Tirch, & Napolitano, 2011), Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 2011) and mindfulness (Segal, Williams, & Teasdale, 2002).

2.4. Measures

2.4.1. Anxiety diagnosis

The child's anxiety disorder diagnosis was ascertained via the standardised semi-structured Anxiety Disorder Interview Schedule, child and parent versions (ADIS-C/P; Silverman & Albano, 1996). Diagnoses were determined based on the child meeting criteria on either child or parent report. Clinician severity ratings (CSR) were also assigned. If there was a discrepancy between CSR based on parent and child report, the higher of the two was taken, and only those with a CSR of four or more (moderate psychopathology) were considered to meet diagnostic criteria. The ADIS-C/P was delivered by research assistants trained to an acceptable level of reliability (Cohen's $k \geq 0.80$). Strong inter-rater agreement was established for all raters for both the parent-report and child-report ADIS ($k = 0.80$–1.00).

2.4.2. Clinical global impressions

Overall improvement in child anxiety was determined using the Clinical Global Impression – Improvement scale (CGI-I; Guy, 1976). The CGI-I is a seven point scale, from 1 (very much improved) to 7 (very much worse). Scores of 1 and 2 represent treatment success (i.e., much or very much improved). CGI-I scores were allocated by blind assessors on the basis of the ADIS-C/P interviews pre- and

---

[2] For more detailed information on this treatment program please contact the corresponding author.

post-treatment. There was adequate inter-rater agreement for CGI-I improvement status (k = 0.83).

2.4.3. Child anxiety symptoms and impact

The Spence Children's Anxiety Scale (SCAS-C/P; Nauta et al., 2004; Spence, 1998) was used to assess child and parent reported child anxiety symptoms. The respondent rates how often the child experiences each of 38 anxiety symptoms, presented alongside six filler items (child version). The impact of the child's anxiety on their everyday functioning was assessed via parent and child report using the Child Anxiety Impact Scale (CAIS-C/P; Langley et al., 2013). Both measures are standardised self/parent-report measures, with acceptable reliability and validity and are often used in clinical and research settings. Internal reliability was adequate across scales (SCAS-P, $\alpha = 0.81$; SCAS-C, $\alpha = 0.91$; CAIS-C, $\alpha = 0.91$; CAIS-P, $\alpha = 0.78$).

2.4.4. Parental responses to children's negative emotions

The primary measure of parent response to their child's negative emotions was their response when the child was engaged in a mildly stressful task, administered pre- and post-treatment at the University clinic. Parents were asked to rate how they felt when their child was giving the presentation on a 0 (not anxious at all) to 10 (very, very anxious) scale. That is, the parent was asked to rate their own anxiety in relation to their child engaging in the stress task. The task is a standard task used in clinical psychology research to induce a mild level of stress in the child (e.g., de Wilde & Rapee, 2008; Hudson, Kendall, Coles, Robin, & Webb, 2002; Thirlwall & Creswell, 2010). The parent and child were instructed that the child would be asked to prepare and deliver a speech, as if they were talking to their peers, and were then given 5 min alone to prepare for the speech. The parent was then asked to give a brief introduction before the child gave his/her presentation to the research assistant operating a video-camera. When the task was re-administered post-treatment it was expected that it would be somewhat less challenging when attempted for the second time. Consequently, the task was modified so that a stranger (confederate) observed and live-rated the speech. The aim of this was to elicit similar levels of anxiety during the task at both time points.

The secondary measure of parents' responses to their child's negative emotions was the 15-item standardised Parental Acceptance and Action Questionnaire (PAAQ; Cheron, Ehrenreich, & Pincus, 2009). The PAAQ assesses parental need for emotional and cognitive control of their child's behaviour, as well as avoidance of their child's negative private events. Example items include "It is OK for my child to feel depressed or anxious" and "I am not afraid of my child's feelings". Internal reliability for this measure was only moderate ($\alpha = 0.60$).

2.4.5. Parental and child behaviours

Parent-child interactions during the speech task were video recorded for later coding. Parents were instructed that 'if help is needed we will leave it to you [parent] to decide what is appropriate'. The following behaviours were coded using the scheme developed by Murray et al. (2012) and adapted by Creswell et al. (2012) for children in this age group. The presence or absence of a particular behaviour was coded for each minute of the interaction on a 1 (behaviour not present) to 5 (behaviour very much present) scale. An average behaviour rating was then taken based on the average score across the five minutes. Behaviours of interest were: (1) expressed anxiety (i.e., modelling of anxiety, including anxiety expressed in facial expressions, body movement and speech); (2) over-protection (i.e., initiates emotional and/or practical support that is not required, such as offering unnecessary help while the child manages independently); (3) intrusiveness (i.e., interferes verbally or physically, such as cutting across child behaviour or

attempts to take over); (4) encouragement (i.e., provides positive motivation for the child to engage in the task, shows enthusiasm regarding child's capacity or efforts); (5) warmth (i.e., affectionate, expresses positive regard for the child); and (6) quality of relationship (an overall sense of relatedness and mutual relatedness between parent and child). Child behaviours were also coded for expressed anxiety (rated on the same 1–5 scale). Videotapes of parent and child behaviours were scored blind to parental group. Intra-class correlations showed good agreement (ICC = 0.73–1.00).

2.5. Analytic strategy

Data were analysed using SPSS version 22. Results were analysed based both on the completer-only sample and on the intent-to treat sample (using multiple imputations). For the primary analyses, repeated measures ANOVAs were used to explore the main effect of time and time*condition interaction for (i) parental tolerance (manipulation check), (ii) parental behaviours, and (iii) child anxiety ratings (scores on the SCAS-C/P and CAIS-C/P). For group differences in dichotomous outcomes (loss of child's primary diagnosis and global improvement) we used chi-square analyses. Bivariate correlations were used to explore whether change (post-treatment score − pre-treatment score) in parental tolerance was associated with change in anxiety rating scores or behaviour, while point-biserial correlations were used to explore whether change in parent tolerance was associated with the dichotomous outcomes (e.g., loss of primary diagnosis).

For the sensitivity analysis, using the intent-to-treat sample, multiple imputation was used with 50 iterations and predictive mean matching, to account for the 15 participants who did not complete the post-treatment assessment. From this data independent samples t-tests were used to check whether differences between conditions for *change* in outcomes of interest (i.e., parental tolerance, behaviours, child anxiety) followed the pattern of results from the Repeated Measures ANOVA, while paired-samples t-tests explored the main effect of time (i.e., change from pre- to post-treatment). Chi-square and correlational analyses were used as described above, to compare pooled intent-to-treat results to the completer-only sample. The pattern of results for the main analyses was the same regardless of whether the completers or intent-to-treat sample was used. Thus, results are presented as completer-only data and any discrepancies noted in text.

3. Results

3.1. Data reduction and preliminary analyses

The preparation phase of the speech task was used to assess parental behaviours as this was the time the parent was most involved, and thus when most variance was observed. Parental overprotection was rarely evidenced during the speech task and was thus dropped from the analyses. Parent's expressions of warmth and encouragement were highly correlated at both time points ($r = 0.68$–0.71 $p < 0.001$) so were combined to form a 'positive parenting' variable. Consequently, the parent behaviours that were examined were positivity, quality of relationship, expressed anxiety and intrusiveness.

To determine whether there was a need to control for child anxiety during the speech task we explored the child's expressed anxiety, along with their self-reported anxiety (rated on a 0 [not at all anxious] to 10 [very, very anxious] scale). On average, children expressed behaviour consistent with mild levels of anxiety at pre-treatment (TCNE: $M = 1.77$, $SE = 0.09$; Control: $M = 1.80$, $SE = 0.11$, $p = 0.85$, $d = 0.05$) and post-treatment (TCNE: $M = 1.75$, $SE = 0.11$; Control: $M = 1.82$, $SE = 0.11$, $p = 0.65$, $d = 0.12$), with no significant dif-

Table 1
Sample demographics.

	TCNE	Control
Demographics		
Child age in years M (SD)	9.78 (1.62)	9.32 (1.77)
% White British	87.5	85.7
% Parent Employed	87.4	89.3
% Marital status (Two-parent household)	56.2	60.7
Primary Diagnosis % (n)		
Separation Anxiety	25.0 (8)	35.7 (10)
Social Phobia	21.9 (7)	21.4 (6)
Specific Phobia Blood	0.0 (0)	3.6 (1)
Specific Phobia Other	6.2 (2)	3.6 (1)
Panic Disorder (PD) without Agoraphobia	0.0 (0)	3.6 (1)
Agoraphobia without PD	3.1 (1)	0.0 (0)
GAD	43.8 (14)	28.6 (8)
Anxiety NoS	0.0 (0)	3.6 (1)
Any Diagnosis % (n)		
Separation Anxiety	68.8 (22)	57.1 (16)
Social Phobia	53.1 (17)	67.9 (19)
Specific Phobia Blood	6.5 (2)	0.0 (0)
Specific Phobia Other	[a]	[a]
Panic Disorder (PD) without Agoraphobia	0.0 (0)	3.6 (1)
Agoraphobia without PD	6.2 (2)	0.0 (0)
GAD	75.0 (24)	75.0 (21)
Anxiety NoS	0.0 (0)	3.6 (1)

Notes: [a] Other specific phobias considered secondary diagnoses were: animal (TCNE: 37.5%, n = 12; Control: 39.3%, n = 11), natural environment (TCNE: 12.5%, n = 4; Control: 14.3%, n = 4), situational (nil for each condition). Other secondary diagnoses were major depression, obsessive compulsive disorder, attention deficit hyperactivity disorder, conduct disorder, oppositional defiance disorder (ODD), selective mutism. With the exception of ODD, no more than three children met any of these criteria as a secondary diagnosis. Six children in both TCNE (18.8%) and Control (21.4%) met criteria for ODD as a secondary diagnosis.

ference between conditions. Similarly, after completing the task children rated their overall anxiety during the task as in the mild to moderate range at pre-treatment (TCNE: M = 4.42, SD = 3.33; Control: M = 5.25, SD = 2.70; p = 0.30, d = 0.27) and post-treatment (TCNE: M = 4.13, SD = 3.19; Control: M = 5.07, SD = 3.09; p = 0.26, d = 0.30), again with no significant difference between conditions. Consequently, child anxiety was not controlled for in later analyses.

There were no significant group differences in demographic variables (p = 0.30 − 0.86; see Table 1) and the child's primary or secondary diagnosis (see Table 1 for percentages). However, baseline differences were apparent for child anxiety symptoms based on parent report (SCAS-P: p = 0.01, d = 0.67; CAIS-P: p = 0.02, d = 0.65) but not child report (SCAS-C: p = 0.93, d = 0.02; CAIS-C: p = 0.21, d = 0.32). In both cases parent-reported child anxiety symptoms were higher in the control condition (see Table 2). There were no significant baseline differences between groups for parent anxiety symptom levels (TCNE: M = 10.84, SD = 9.32; Control: M = 13.19, SD = 10.26; p = 0.37, d = 0.24).

3.2. Manipulation check: parent tolerance of child's negative emotions

As shown in Table 2, parent's anxiety when supporting their child in the task and their self-reported tolerance based on the PAAQ, both significantly reduced from pre- to post-treatment. However, this reduction was true for both conditions, with no evidence of a significant time*condition interaction. Consequently, while parent tolerance of their child's anxiety significantly improved, there was no evidence that the TCNE condition had any further benefit for improving tolerance than the control condition.

3.3. Parental behaviours

Pre- and post-treatment parent behaviours are presented in Table 3. There were no significant main effects of time for positivity, overall quality of the relationship or parents' expressed anxiety, but there was a significant increase in intrusive behaviours, when the confederate was added at post-treatment. While intrusiveness increased, on average it remained mild. There were no significant time*condition interactions on the negative parenting domains (intrusiveness, expressed anxiety). However, a significant interaction was evident on the positive domains (positive parenting: p = 0.02, partial n^2 = 0.13; quality of relationship: p = 0.03, partial n^2 = 0.12). This stemmed from a slight (non-significant) increase in the behaviour for the TCNE condition (positive: p = 0.07, d = 0.52; quality: p = 0.21, d = 0.40) and a slight decrease in the control condition (positive: p = 0.14, d = 0.41; quality: p = 0.04, d = 0.50), which was significant for quality of relationship only. When using intent-to-treat data (from multiple imputations) change in behaviour between conditions was only significant for quality of relationship (p = 0.04, d = 0.54), favouring the TCNE condition, with no significant difference between conditions for change in positive parenting (p = 0.18, d = 0.34).

3.4. Associations between change in tolerance of children's negative emotions and change in parent behaviour

Using the combined sample, we explored whether changes in parental tolerance were associated with changes in parent behaviours during the speech task. From the bivariate correlations change in tolerance based on the parent's anxiety rating was significantly associated with change in intrusiveness (r = 0.45, p = 0.004), with greater improvement in tolerance (i.e., reduction in ratings of anxiety during task) associated with greater improvements in intrusiveness (i.e., less intrusive behaviour). Tolerance from this measure was not associated with change in any other behaviour (positive parenting: r = 0.02, p = 0.89; quality: r = −0.10, p = 0.51; expressed anxiety: r = 0.03, p = 0.86). Change in parental tolerance based on scores on the PAAQ were not significantly associated with change on any behaviour domain (positive: r = 0.09, p = 0.60; quality: r = 0.08, p = 0.63; intrusive: r = 0.20, p = 0.22; anxiety: r = −0.06, p = 0.71).

3.5. Child anxiety outcomes

Of those children whose parents completed treatment 55% of children in the TCNE treatment (12 of 22 children) no longer met diagnostic criteria for their primary diagnosis and 77% (n = 17) were rated as much or very much improved. Similarly, in the control condition, 61% (14 of 23) of children no longer met criteria for their primary diagnosis post-treatment, while 70% (n = 16) were rated as much or very much improved. There was no evidence that the TCNE treatment condition had a significant benefit over the control condition (diagnosis status: p = 0.67, phi = 0.06; clinical improvement: p = 0.56, phi = 0.09).

There were significant main effects of time across all parent- and child-report measures of child anxiety (see Table 2). There were no time*condition interactions for the child-reported anxiety symptoms (SCAS-C, CAIS-C) but significant interactions were evident on parent-report of child anxiety symptoms and impact. In both cases this reflected a significant difference in baseline ratings (SCAS-P p = 0.01, d = 0.67; CAIS-P p = 0.02, d = 0.65) but no significant difference in post-treatment ratings (SCAS-P p = 0.86, d = 0.05; CAIS-P p = 0.84, d = 0.06).

Table 2
Means (standard deviation) and results of repeated measures ANOVAs for parent tolerance and child outcomes.

	TCNE		Control		Main Effect of Time			Time*Condition		
	Pre	Post	Pre	Post	F	p	partial n^2	F	p	partial n^2
Parent Measures										
Tolerance of child'sanxiety	5.00 (2.58)	4.06 (1.86)	6.25 (2.22)	5.41 (2.72)	7.74	0.01	0.12	0.07	0.80	0.001
PAAQ	56.29 (12.81)	46.33 (13.94)	60.54 (11.14)	44.00 (11.73)	53.52	<0.001	0.58	2.05	0.16	0.05
Child Measures										
ADIS CSR	5.53 (0.88)	2.77 (2.25)	5.18 (0.86)	2.57 (2.02)	74.18	<0.001	0.63	0.001	0.98	<0.001
SCAS (child report)	43.19 (18.67)	37.71 (17.68)	43.61 (15.98)	34.15 (11.22)	14.66	<0.001	0.27	0.23	0.63	0.01
SCAS (parent report)	36.47 (13.72)	31.29 (13.13)	45.67 (13.71)	31.95 (11.52)	20.42	<0.001	0.34	4.98	0.03	0.11
CAIS (child report)	27.06 (16.59)	19.19 (14.56)	22.37 (11.97)	17.63 (9.26)	6.78	0.01	0.15	0.003	0.96	<0.001
CAIS (parent report)	19.52 (13.87)	16.95 (12.62)	28.04 (11.97)	16.15 (13.00)	11.75	0.001	0.23	5.34	0.03	0.12

Note: Tolerance (parent rating of their own anxiety during their child's participation in the speech task, rated on a 0–10 scale); PAAQ (Parental Acceptance and Action Questionnaire); ADIS CSR (clinical severity rating on the Anxiety Disorder Interview Schedule), SCAS (Spence Children's Anxiety Scale), CAIS (Child Anxiety Impact Scale).

Table 3
Means (standard deviations) and results of repeated measures ANOVAs for parental behaviours.

	TCNE		Control		Main Effect of Time			Time*Condition		
	Pre	Post	Pre	Post	F	p	partial n^2	F	p	partial n^2
Positive parenting	2.87 (0.31)	3.13 (0.64)	3.12 (0.35)	2.93 (0.55)	0.15	0.70	0.004	5.67	0.02	0.13
Quality of interaction	3.32 (0.33)	3.54 (0.71)	3.37 (0.37)	3.11 (0.63)	0.05	0.83	0.001	5.14	0.03	0.12
Intrusiveness	1.64 (0.55)	2.06 (0.79)	1.39 (0.37)	2.19 (0.84)	27.09	<0.001	0.41	2.50	0.12	0.06
Expressed Anxiety	1.47 (0.48)	1.60 (0.55)	1.53 (0.56)	1.58 (0.52)	0.79	0.38	0.02	0.14	0.71	0.003

Note: All behaviours were rated on a 0 [behaviour not present] to 5 [behaviour very much present] scale. Effect of Time represents results of paired-samples *t*-tests.

3.6. Associations between change in tolerance of children's negative emotions and child treatment outcomes

Change in tolerance of child's emotions (based on parents' self-reported anxiety during the speech task) was not associated with whether or not the child lost their primary diagnosis or their clinical improvement status (diagnosis: $r_{pb} = 0.02$, $p = 0.88$; improvement: $r_{pb} = -0.01$, $p = 0.94$). A similar pattern of results was found based on change in scores on the PAAQ (diagnosis: $r_{pb} = 0.14$, $p = 0.40$; improvement: $r_{pb} = 0.13$, $p = 0.42$). Change in tolerance (from parent anxiety rating) was not significantly associated with change on any child anxiety measures (SCAS-C: $r = 0.26$, $p = 0.10$; SCAS-P: $r = 0.16$, $p = 0.31$; CAIS-C: $r = 0.08$, $p = 0.64$; CAIS-P: $r = -0.03$, $p = 0.88$). Change in tolerance based on the PAAQ was only significantly associated with change in child ratings on the CAIS-C ($r = 0.40$, $p = 0.01$) but not any other measure (SCAS-C: $r = 0.21$, $p = 0.20$; SCAS-P: $r = 0.29$, $p = 0.07$; CAIS-P: $r = 0.29$, $p = 0.07$). From the intent-to-treat sample change in tolerance on either measure was not significantly associated with change on any child anxiety measure.

4. Discussion

CBT is considered to be an efficacious treatment for childhood anxiety disorders, however it is less effective if the parent also experiences high levels of anxiety (e.g., Hudson et al., 2014). It has been hypothesised that this may be due to the parent finding it more difficult to manage their child's negative or anxious emotions, leading them to engage in behaviours that are potentially detrimental to the therapy process, particularly in anxiety-provoking situations. In this pilot study we used an RCT design to test the directional relationship between parent's tolerance of their child's negative emotions, their behaviour when engaged in a stressful task with the child, and ultimately, treatment outcomes for child anxiety, using a novel parent-delivered treatment. While the novel treatment did successfully improve parental tolerance of their child's anxiety, this improvement was also found in the comparison treatment condition. Furthermore, there was little evidence that altering parental tolerance was associated with changes in behaviour or

treatment outcomes. The only exceptions to this was the finding that improved tolerance of the child's anxiety during the speech task was associated with less intrusive behaviour and improvements in the child's report on the impact of their anxiety (although the latter did not hold true using intent-to-treat data).

Contrary to expectations, the novel adjunct treatment that specifically targeted the parent's tolerance of their child's negative emotions did not improve tolerance of children's negative affect beyond that seen in the comparison treatment (where tolerance was not targeted). As tolerance improved equally in both conditions we were unable to test the directional hypothesis. Nevertheless, these findings demonstrate that although parents who are highly anxious may respond in potentially maladaptive ways to their child's anxiety (Creswell et al., 2012), these responses will change in response to successful treatment of the child's anxiety. Findings provide support for a reciprocal relationship between parent and child responses to treatment, where parent anxiety when their child is under stress may lead to more negative or intrusive responses to child anxiety, but reducing children's anxious responses to potential stressors via treatment will also reduce these parent responses (e.g., Murray et al., 2009; Rapee, Schniering, & Hudson, 2009).

Contrary to hypotheses that parent-delivered programs may be less suitable in the context of high parental anxiety (e.g., Chavira et al., 2014), our results suggest that parent-delivered CBT for child anxiety is a potential treatment option, even when the parent is experiencing high anxiety. In line with previous research (see James et al., 2013), at post-treatment approximately 55–60% of children no longer met their primary anxiety disorder diagnosis, while over 70% showed clinically significant improvements. Thus, it may in fact be that a parent-delivered approach provides anxious parents with an opportunity to build their confidence and sense of control in managing their child's anxiety. Through the parent-delivered treatment, the parent can be supported to develop skills and confidence that result in less accommodating or maladaptive responses to the child's own anxiety (Storch et al., 2015) and/or reduced modelling of potentially maladaptive anxiety-driven behaviours (e.g., avoidance; Lebowitz, Omer, Hermes, & Scahill, 2014). Thus, findings add to the growing body of work demonstrating the clinical utility of

parent-delivered CBT for child anxiety. Importantly, such studies provide therapists with a treatment option outside of child-led CBT, allowing child anxiety to be targeted even in the event of child non-compliance (Lebowitz et al., 2014), and now, even where the parent themselves may be experiencing heightened anxiety. Comparing change in parental responses to child anxiety in parent-led versus child-focussed CBT would be a particularly interesting avenue for future research.

In contrast to predictions, there was little evidence that the improvement in parent tolerance was associated with treatment gains or improvements in the parent's behaviour when engaged in a stress-inducing task. Notably the task that we employed to measure parent tolerance of child negative emotions elicited only mild levels of stress, and whether the results would have differed if the child experienced more intense anxiety (for example, when completing a behavioural experiment) is not known. It is also important to note that the inclusion of the stress tasks was not designed to examine main effects over time, due to the more challenging procedure at the post-treatment assessment (i.e., addition of a confederate).

Overall, findings are in contrast to models of the maintenance of anxiety disorders that suggest that targeting and changing parental anxiety should enhance treatment outcomes (e.g., Hudson & Rapee, 2001; Murray et al., 2009). It is possible that the reduced treatment outcomes found among children with anxiety disorders who have highly anxious parents might be better explained by other factors, such as genetics, characteristics of general family functioning or family stress (e.g. Schleider et al., 2015). Such factors may result in a reduced capacity to generalise the use of strategies learnt in treatment to situations outside of the treatment room. Moreover, it may be that other parent-driven factors, not covered in this pilot study, mediate the change in child anxiety. For example, parent-led treatments may lead to reductions in family accommodation of the child's anxiety (e.g., Storch et al., 2015) or reductions in modelling of potentially anxiogenic behaviours in daily life (e.g., Lebowitz, Shic, Campbell, MacLeod, & Silverman, 2015); factors not specifically addressed in the current pilot study. Further research on these areas is warranted, particularly larger scale research that can provide comparisons between different potential parent-driven mediators to treatment change.

4.1. Limitations

RCT designs provide a novel way of exploring directional relationships between potentially important variables that may impact treatment outcomes (Hudson et al., 2002). However, as this research was primarily designed to test hypotheses about mechanisms of change during treatment we did not include a follow-up phase and, consequently, we were unable to explore the maintenance of treatment gains. Moreover, as this was a pilot study the sample was small which may have affected our ability to detect associations. Issues such as participant drop-out, homogenous ethnicity, and the predominant involvement of mothers in treatment, also impact on the generalizability of the findings. We were also unable to explore finer-grain questions around whether particular types of parent or child anxiety (e.g., generalised anxiety vs. social anxiety) may have impacted on treatment outcomes. Further, we cannot rule out that a more intense adjunct intervention may have successfully changed parental tolerance, beyond that in the comparison condition. These remain important areas for future research.

4.2. Summary and implications

The finding that the TCNE adjunct failed to improve parental tolerance or treatment outcomes above that observed in the comparison treatment has important implications. First, they provide preliminary evidence that specifically targeting parental responses to their child's anxiety does not have added benefit in terms of both parental responses and child outcomes, over and above what happens in guided parent-delivered CBT. We have also shown preliminary evidence that a relatively brief parent-delivered intervention can be effective even when parents themselves are high in anxiety. Finally, in contrast with current models of the maintenance of child anxiety, we found no evidence that improving parent tolerance of children's negative emotions was associated with child treatment benefits. Consequently, there is a clear need to continue to explore these relationships further, to ascertain the appropriateness of current models of child anxiety and ultimately how we can improve treatments.

Conflicts of interest

All authors confirm no conflicts of interest.

Acknowledgements

References

Bittner, A., Egger, H. L., Erkanli, A., Jane Costello, E., Foley, D. L., & Angold, A. (2007). What do childhood anxiety disorders predict? *Journal of Child Psychology and Psychiatry, 48*(12), 1174–1183.

Bodden, D. H., Dirksen, C. D., & Bögels, S. M. (2008). Societal burden of clinically anxious youth referred for treatment: a cost-of-illness study. *Journal of Abnormal Child Psychology, 36*(4), 487–497.

Breinholst, S., Esbjørn, B. H., Reinholdt-Dunne, M. L., & Stallard, P. (2012). CBT for the treatment of child anxiety disorders: a review of why parental involvement has not enhanced outcomes. *Journal of Anxiety Disorders, 26*(3), 416–424.

Brown, T. A., DiNardo, P., Barlow, D. H., & DiNardo, P. A. (1994). *Anxiety disorders interview schedule for DSM-IV: client interview schedule.* Oxford University Press.

Chavira, D. A., Drahota, A., Garland, A. F., Roesch, S., Garcia, M., & Stein, M. B. (2014). Feasibility of two modes of treatment delivery for child anxiety in primary care. *Behaviour Research and Therapy, 60*, 60–66.

Cheron, D. M., Ehrenreich, J. T., & Pincus, D. B. (2009). Assessment of parental experiential avoidance in a clinical sample of children with anxiety disorders. *Child Psychiatry and Human Development, 40*(3), 383–403.

Cobham, V. E., Dadds, M. R., & Spence, S. H. (1998). The role of parental anxiety in the treatment of childhood anxiety. *Journal of Consulting and Clinical Psychology, 66*(6), 893.

Cobham, V. E. (2012). Do anxiety-disordered children need to come into the clinic for efficacious treatment? *Journal of Consulting and Clinical Psychology, 80*(3), 465–476.

Compton, S. N., Peris, T. S., Almirall, D., Birmaher, B., Sherrill, J., Kendall, P. C., . . . & Albano, A. M. (2014). Predictors and moderators of treatment response in childhood anxiety disorders: results from the CAMS trial. *Journal of Consulting and Clinical, 82*, 212–224.

Costello, E. J., Egger, H., & Angold, A. (2005). 10-year research update review: the epidemiology of child and adolescent psychiatric disorders: I. Methods and public health burden. *Journal of the American Academy of Child & Adolescent Psychiatry, 44*(10), 972–986.

Creswell, C., Apetroaia, A., Murray, L., & Cooper, P. (2012). Cognitive, affective, and behavioral characteristics of mothers with anxiety disorders in the context of child anxiety disorder. *Journal of Abnormal Psychology, 122*(1), 26–38.

Creswell, C., Hentges, F., Parkinson, M., Sheffield, P., Willetts, L., & Cooper, P. (2010). Feasibility of guided cognitive behaviour therapy (CBT) self-help for childhood anxiety disorders in primary care. *Mental Health in Family Medicine, 7*(1), 49–57.

Creswell, C., Waite, P., & Cooper, P. J. (2014). Assessment and management of anxiety disorders in children and adolescents. *Archives of Disease in Childhood, 99*(7), 674–678.

Creswell, C., & Willets, L. (2012). *Overcoming your child's fears and worries.* London: Constable & Robinson.

de Wilde, A., & Rapee, R. M. (2008). Do controlling maternal behaviours increase state anxiety in children's responses to a social threat? A pilot study. *Journal of Behavior Therapy and Experimental Psychiatry, 39*(4), 526–537.

Essau, C. A., Conradt, J., & Petermann, F. (2000). Frequency, comorbidity, and psychosocial impairment of anxiety disorders in German adolescents. *Journal of Anxiety Disorders, 14*(3), 263–279.

Ford, T., Goodman, R., & Meltzer, H. (2003). The British child and adolescent mental health survey 1999: the prevalence of DSM-IV disorders. *Journal of the American Academy of Child & Adolescent Psychiatry, 40*(10), 1203–1211.

Gerull, F. C., & Rapee, R. M. (2002). Mother knows best: effects of maternal modelling on the acquisition of fear and avoidance behaviour in toddlers. *Behaviour Research and Therapy, 40*(3), 279–287.

Guy, W. (1976). Clinical global impression scale. *The ECDEU Assessment Manual for Psychopharmacology-Revised. Volume DHEW Publ No ADM 76*, Rockville, MD:U.S. Department of Health, Education, and Welfare, Public Health Service, Alcohol, Drug Abuse, and Mental Health Administration, NIMH Psychopharmacolgy Research Branch, Division of Extramural Research Program, 338, 218–222.

Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (2011). *Acceptance and commitment therapy: the process and practice of mindful change.* Guilford Press.

Hudson, J. L., Comer, J. S., & Kendall, P. C. (2008). Parental responses to positive and negative emotions in anxious and nonanxious children. *Journal of Clinical Child & Adolescent Psychology, 37*(2), 303–313.

Hudson, J. L., Kendall, P. C., Coles, M. E., Robin, J. A., & Webb, A. (2002). The other side of the coin: using intervention research in child anxiety disorders to inform developmental psychopathology. *Development and Psychopathology, 14*(04), 819–841.

Hudson, J. L., Newall, C., Rapee, R. M., Lyneham, H. J., Schniering, C. C., . . . Wuthrich, V. M., . . . & Gar, N. S. (2014). The impact of brief parental anxiety management on child anxiety treatment outcomes: a controlled trial. *Journal of Clinical Child & Adolescent Psychology, 43*(3), 370–380.

Hudson, J. L., & Rapee, R. M. (2001). Parent–child interactions and anxiety disorders: an observational study. *Behaviour Research and Therapy, 39*(12), 1411–1427.

James, A. C., James, G., Cowdrey, F. A., Soler, A., & Choke, A. (2013). Cognitive behavioural therapy for anxiety disorders in children and adolescents. *Cochrane Database of Systematic Reviews, 6.*

Langley, A. K., Falk, A., Peris, T., Wiley, J. F., Kendall, P. C., Ginsburg, G., . . . & Piacentini, J. (2013). The child anxiety impact scale: examining parent-and child-reported impairment in child anxiety disorders. *Journal of Clinical Child & Adolescent Psychology*, 1–13.

Leahy, R. L., Tirch, D., & Napolitano, L. A. (2011). *Emotion regulation in psychotherapy.* New York: Guilford Press.

Lebowitz, E. R., Omer, H., Hermes, H., & Scahill, L. (2014). Parent training for childhood anxiety disorders: the SPACE program. *Cognitive and Behavioral Practice, 21*(4), 456–469.

Lebowitz, E. R., Shic, F., Campbell, D., MacLeod, J., & Silverman, W. K. (2015). Avoidance moderates the association between mothers' and children's fears: findings from a novel motion-tracking behavioural assessment. *Depression and Anxiety, 32*(2), 91–98.

Leong, J., Cobham, V. E., De Groot, J., & McDermott, B. (2009). Comparing different modes of delivery. *European Child & Adolescent Psychiatry, 18*(4), 231–239.

Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: comparison of the depression anxiety stress scales (DASS) with the beck depression and anxiety inventories. *Behaviour Research and Therapy, 33*(3), 335–343.

Lundkvist-Houndoumadi, I., Hougaard, E., & Thastum, M. (2014). Pre-treatment child and family characteristics as predictors of outcome in cognitive behavioural therapy for youth anxiety disorders. *Nordic Journal of Psychiatry, 68*(8), 524–535.

Lyneham, H. J., & Rapee, R. M. (2006). Evaluation of therapist-supported parent-implemented CBT for anxiety disorders in rural children. *Behaviour Research and Therapy, 44*(9), 1287–1300.

Moore, P. S., Whaley, S. E., & Sigman, M. (2004). Interactions between mothers and children: impacts of maternal and child anxiety. *Journal of Abnormal Psychology, 113*(3), 471.

Murray, L., Creswell, C., & Cooper, P. J. (2009). The development of anxiety disorders in childhood: an integrative review. *Psychological Medicine, 39*(09), 1413–1423.

Murray, L., Lau, P. Y., Arteche, A., Creswell, C., Russ, S., Zoppa, L. D., . . . & Cooper, P. (2012). Parenting by anxious mothers: effects of disorder subtype, context and child characteristics. *Journal of Child Psychology and Psychiatry, 53*(2), 188–196.

Nauta, M. H., Scholing, A., Emmelkamp, P. M., & Minderaa, R. B. (2003). Cognitive-behavioral therapy for children with anxiety disorders in a clinical setting: no additional effect of a cognitive parent training. *Journal of the American Academy of Child & Adolescent Psychiatry, 42*(11), 1270–1278.

Nauta, M. H., Scholing, A., Rapee, R. M., Abbott, M., Spence, S. H., & Waters, A. (2004). A parent-report measure of children's anxiety: psychometric properties and comparison with child-report in a clinic and normal sample. *Behaviour Research and Therapy, 42*(7), 813–839.

Rapee, R. M., Schniering, C. A., & Hudson, J. L. (2009). Anxiety disorders during childhood and adolescence: origins and treatment. *Annual Review of Clinical Psychology, 5*(1), 311–341.

Reynolds, S., Wilson, C., Austin, J., & Hooper, L. (2012). Effects of psychotherapy for anxiety in children and adolescents: a meta-analytic review. *Clinical Psychology Review, 32*(4), 251–262.

Schleider, J. L., Ginsburg, G. S., Keeton, C. P., Weisz, J. R., Birmaher, B., Kendall, P. C., . . . & Walkup, J. T. (2015). Parental psychopathology and treatment outcome for anxious youth: roles of family functioning and caregiver strain. *Journal of Consulting and Clinical Psychology*, http://dx.doi.org/10.1037/a0037935. Advance online publication

Segal, Z. V., Williams, J. M. G., & Teasdale, J. D. (2002). *Mindfulness-based cognitive therapy for depression: a new approach to relapse prevention.* New York: The Guildford Press.

Silverman, W. K., & Albano, A. M. (1996). *. Anxiety disorders interview schedule for DSM-IV: parent interview schedule* (vol. 1) Oxford: University Press.

Silverman, W. K., Kurtines, W. M., Jaccard, J., & Pina, A. A. (2009). Directionality of change in youth anxiety treatment involving parents: an initial examination. *Journal of Consulting and Clinical Psychology, 77*(3), 474.

Smith, A. M., Flannery-Schroeder, E. C., Gorman, K. S., & Cook, N. (2014). Parent cognitive-behavioral intervention for the treatment of childhood anxiety disorders: a pilot study. *Behaviour Research and Therapy, 61*, 156–161.

Spence, S. H. (1998). A measure of anxiety symptoms among children. *Behaviour Research and Therapy, 36*(5), 545–566.

Storch, E. A., Salloum, A., Johnco, C., Dane, B. F., Crawford, E. A., King, M. A., . . . & Lewin, A. B. (2015). Phenomenology and clinical correlates of family accommodation in pediatric anxiety disorders. *Journal of Anxiety Disorders, 35*, 75–81.

Thirlwall, K., & Creswell, C. (2010). The impact of maternal control on children's anxious cognitions, behaviours and affect: an experimental study. *Behaviour Research and Therapy, 48*(10), 1041–1046.

Thirlwall, K., Cooper, P. J., Karalus, J., Voysey, M., Willetts, L., & Creswell, C. (2013). Treatment of child anxiety disorders via guided parent-delivered cognitive-behavioural therapy: randomised controlled trial. *The British Journal of Psychiatry, 203*(6), 436–444.

Tiwari, S., Podell, J. C., Martin, E. D., Mychailyszyn, M. P., Furr, J. M., & Kendall, P. C. (2008). Experiential avoidance in the parenting of anxious youth: theory, research, and future directions. *Cognition and Rmotion, 22*(3), 480–496.

Wood, J. J., McLeod, B. D., Sigman, M., Hwang, W. C., & Chu, B. C. (2003). Parenting and childhood anxiety: theory, empirical findings, and future directions. *Journal of Child Psychology and Psychiatry, 44*(1), 134–151.