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A randomized-controlled examination of the effect of cognitive reappraisal instruction on maternal accommodation of child anxiety symptoms

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ABSTRACT

Parental accommodation plays a key role in the maintenance of child anxiety, yet much of the research to date has been correlational, making it difficult to draw conclusions about underlying mechanisms. Given preliminary evidence that parental beliefs play a role in parental accommodation, the present study sought to experimentally reduce accommodation by targeting parental attitudes about child anxiety. Mothers of children ages 4–9 (N = 47) were randomly assigned to either receive brief instruction in cognitive reappraisal (EXP) or to a control intervention in which they received no instruction (CON). At pre- and post-intervention mothers were presented with bogus information that their child was experiencing varying levels of distress while completing a task in a nearby room. Maternal distress, negative affect and perceived likelihood of accommodation in the context of child distress were measured pre- and post-intervention. EXP mothers reported greater pre- to post-intervention decreases in distress and perceived likelihood of accommodation, compared to CON mothers. EXP and CON mothers showed similar changes in negative affect. Findings from this study provide preliminary experimental evidence that targeting maternal beliefs about child anxiety can result in changes in maternal distress and behavior following exposure to child distress. Implications for prevention and treatment are discussed.

1. Introduction

Parental accommodation—referring to the involvement of caregivers in facilitating youth avoidance of anxiety-provoking stimuli or in alleviating youth distress caused by anxiety (Calvocoressi et al., 1995; Jones, Lebowitz, Marin, & Stark, 2015; Thompson-Hollands, Kerns, Pincus, & Comer, 2014)—has been observed to play a key role in the maintenance and burdens of youth anxiety and obsessive compulsive disorder (OCD) (Benito et al., 2015; Kagan, Peterman, Carper, & Kendall, 2016; Lebowitz, Omer, Hermes, & Scahill, 2014; Thompson-Hollands, Kerns et al., 2014). Although experimental work can meaningfully improve our understanding of factors that contribute to the likelihood of accommodation, to date research on family accommodation has been largely correlational. Such research fits within an experimental therapeutics framework (Insel & Gogtay, 2014), providing a greater understanding of targetable factors that relate to family accommodation and its reduction.

Research finds the majority of parents of youth with anxiety disorders report engaging in accommodation in response to anxious behavior (Benito et al., 2015; Thompson-Hollands, Kerns et al., 2014). This most commonly takes the forms of providing reassurance, facilitating avoidance (Benito et al., 2015), modifying family routines, and adhering to child-assigned rules around anxiety stimuli (Lebowitz, Panza, Su, & Bloch, 2012; Thompson-Hollands, Kerns et al., 2014). Greater frequency of accommodation is associated with severity of child anxiety, maternal anxiety and distress (Thompson-Hollands, Kerns et al., 2014), parent-rated impairment in school and home functioning, and child-rated school impairment (Benito et al., 2015). Anxious mothers and mothers high on experiential avoidance are more likely to accommodate than less anxious and avoidant mothers (Feinberg, Kerns, Pincus, & Comer, 2018; Jones et al., 2015), and there is preliminary evidence that maternal accommodation may mediate the relationship between maternal anxiety and child anxiety (Jones et al., 2015).

Family accommodation has the potential to maintain child anxiety via negative reinforcement of avoidance of anxious stimuli, and thus is at odds with the goals of exposure therapy, a key component in evidence-based treatment of child anxiety (Kendall et al., 2005; Tiwari, Kendall, Hoff, Harrison, & Fizur, 2013). Indeed, accommodation has consistently been found to predict poorer treatment response in exposure-based cognitive behavioral therapy in youth with anxiety and

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OCD (Garcia et al., 2010; Kagan et al., 2016). Accommodation decreases over the course of successful treatment (Kagan et al., 2016; Lebowitz, Omer et al., 2014; Merlo, Lehmkuhl, Geffken, & Storch, 2009), with some evidence suggesting that decreases in accommodation precede symptom improvement (Piacentini et al., 2011). Several recent modifications of anxiety treatments aim to target accommodation more directly, whether through parent training alone or in conjunction with more traditional child-focused CBT (Comer et al., 2012; Comer, Hong, Poznanski, Silva, & Wilson, 2019; Freeman et al., 2014; Kagan et al., 2016; Lebowitz, Omer et al., 2014; Rudy, Zavrou, Johnco, Storch, & Lewin, 2017; Thompson-Hollands, Edson, Tompson, & Comer, 2014). Moreover, several more traditional CBT's for child anxiety with empirical support have briefly incorporated content related to parental accommodation (e.g., Kendall, Hudson, Gosch, Flannery-Schroeder, & Suveg, 2008). However, given the broad, multicomponent nature of these interventions, the precise mechanism(s) through which they may reduce accommodation and/or child anxiety remains unclear.

Current theoretical models of accommodation may offer insight into possible mechanisms and strategies for targeting accommodation in a treatment context. Youth who have come to rely on parental assistance in their avoidance may react negatively to changes in parental behavior, resulting in an increase in both child and parent distress. To understand how best to aid parents in reducing accommodation of their child's anxiety, it is necessary to understand the internal processes that may underlie parental distress in the face of child negative affect. Compared to parents of non-anxious youth, parents of anxious youth typically experience increased distress when faced with child negative emotion (Aschenbrand & Kendall, 2012; Turner, Beidel, Roberson-Nay, & Tervo, 2003). Parent cognitive and emotional responses in the context of child distress may increase the parent's own distress and impact the likelihood they will work to reduce their child's distress, even in normative developmental challenges (Kerns, Pincus, McLaughlin, & Comer, 2017).

Parent emotions, attitudes, and behaviors may increase their engagement in accommodating behavior, and thus identifying these processes may inform appropriate ways of targeting accommodation. Parental tolerance of youth distress may hinge on the parent's ability to utilize adaptive emotion regulation strategies to manage their own distress, particularly when directly confronted with their child's distress. Emotion regulation difficulties are associated with anxiety symptoms in adults (Mennin, Heimberg, Turk, & Fresco, 2005; Wirtz, Hofmann, Riper, & Berking, 2014) and given the higher prevalence of parental anxiety in samples of anxious youth (Cooper, Fearn, Willetts, Seabrook, & Parkinson, 2006), it is not surprising that many parents of anxious youth struggle with emotion regulation themselves. This anxiety and associated experiential avoidance may lead to ineffective emotion regulation strategy use in the context of child distress, resulting in greater likelihood of accommodation and child anxiety (Feinberg et al., 2018; Kerns et al., 2017). Preliminary correlational research supports the notion that parents who report using reappraisal to manage their own emotions are more likely to utilize supportive responses with distressed youth (Remmes & Ehrenreich-May, 2014). Parental use of reappraisal in the context of youth distress may aid in not only regulating their own emotional experience, but potentially altering maladaptive beliefs about child anxiety. However, in the context of family-based treatment for youth anxiety, little research exists examining ways in which parental use of emotion regulation strategies to manage their own distress can be altered to aid in reduction of parental accommodation of child anxiety symptoms.

In addition to parents' emotional experience when facing their child's anxiety, specific parental beliefs regarding child anxiety and their own child's ability to cope with anxiety also have implications for the ways in which parents behaviorally respond to their child's distress. As noted above, parental use of reappraisal relates to supportive parenting responses in the context of youth distress (Remmes & Ehrenreich-May, 2014), potentially via belief change. Moreover, elevated parental beliefs about responsibility for protecting their child from harm have predicted more intrusive parenting behaviors during a stressor task (Apetroaia, Hill, & Creswell, 2015), and mothers who hold negative beliefs about their child's experience of anxiety have reported higher levels of accommodation (Feinberg et al., 2018; Settipani & Kendall, 2017). Additionally, parents who believe that accommodation prevents youth from losing behavioral and emotional control engage in more frequent accommodation (Meyer et al., 2018).

The current study employed an experimental approach with families with varying levels of youth anxiety in order to directly target maternal emotion regulation in the context of child distress, with the hope this could have secondary benefit of reducing maternal accommodation. Given preliminary evidence that parental attitudes and emotion regulation play an important role in parental accommodation of youth symptoms, the present study sought to experimentally reduce accommodation by targeting maternal attributions. Specifically, this study aimed to reduce mothers' distress and their perceived likelihood of accommodation in the context of child anxiety using a brief cognitive reappraisal intervention aimed at bolstering maternal emotion regulation skills during child distress. This study used a child distress task in which all mothers were presented with standardized information about child distress, but in contrast to accommodation paradigms used in previous studies (Aschenbrand & Kendall, 2012; Kerns et al., 2017; Settipani & Kendall, 2017), to increase ecological validity mothers in this study were led to believe the information they received about child distress was about their own child.

We hypothesized that mothers who received the brief cognitive reappraisal intervention, relative to control mothers, would report lower subjective personal distress when presented with information their child was in distress. We also anticipated that mothers' perceived likelihood of engaging in accommodation when their child completed a distressing task would decrease more among mothers who received the brief cognitive reappraisal intervention relative to mothers receiving the control intervention.

2. Methods

2.1. Participants

Participants included 47 youth ages 4–9, and their mothers, with varied levels of maternal and child anxiety (ranging from non-clinical to clinical). This particular age range of youth was targeted in order to address the fact that most correlational studies of family accommodation in child anxiety include large child age ranges (Jones et al., 2015; Lebowitz, Scharfstein, & Jones, 2014; Thompson-Hollands, Kerns et al., 2014). Use of a broadly aged sample presents a confound when incorporating a standardized child distress task (i.e., age-appropriate distress and parental intervention varies across development). A younger age range was selected for the current study due to findings that parents of younger children engage in a greater range of accommodation (Thompson-Hollands, Kerns et al., 2014), the fact that parents of younger children may be less aware of developmentally inappropriate accommodation due to lower expectations for independence relative to older children (Kagan, Frank, & Kendall, 2017), the importance of family-based intervention strategies when treating younger anxious children (Comer et al., 2019), and for consistency with prior research that has used standardized child distress tasks to assess parental accommodation (Kerns et al., 2017).

Participants were recruited from a variety of sources in order to ensure mother and child anxiety variability. Recruitment sources included online advertisements, community recruitment flyers and a mental health clinic. Youth between the ages of 4–9 (inclusive) were eligible and mothers were required to be English speaking and capable of using a computer. Youth were excluded if they had mother-reported developmental delay. Fifty-six participants were deemed eligible and invited to participate. Participants were randomized into 1 of 2 groups:

Table 1
Sample demographic characteristics.

	Total Sample (N = 47)	
	M	*SD*
Child Age, years	6.43	1.9
Mother Age	39.19	6.2
	N	%
Gender		
Female	24	51.1
Male	23	48.9
Race		
White	29	61.7
Asian/Asian American	6	12.8
Black/African American	5	10.6
Bi-Racial	6	12.8
Other	1	2.1
Ethnicity		
Non-Hispanic	45	95.7
Hispanic	2	4.3
Annual Household Income		
0-25,000	6	12.8
25,001–50,000	3	6.4
50,001–75,000	7	14.9
75,001–100,000	7	14.9
100,001–150,000	5	10.6
150,001–200,000	7	14.9
> 200,000	11	23.4
Parent Marital Status		
Married	37	78.7
Not married	10	21.3
Parent Highest Level of Education		
Completed college	41	87.2
Did not complete college	6	12.8

experimental group (EXP, n = 30) and control group (CON, n = 26). See procedures section for details on the EXP and CON groups. Randomization was assigned prior to study appointment, although subjects were not informed of their randomization prior to attending their appointment. Of these 56 participants, 9 participants did not attend the study appointment, resulting in a total of 47 participants who were included in analyses (EXP, n = 25; CON, n = 22). One participant in the EXP group did not complete full study procedures and is not included in some analyses (see Table 2). Table 1 presents the socio-demographic characteristics of the sample. Approximately half of youth participants were female, and three-fifths of the participating children were identified by their mother as white/Caucasian. The majority of participating mothers had completed college and most of the youth in the study had parents who were married. Total household annual income varied, with roughly half of the sample earning less than $100,000/year and roughly half of the sample more than $100,000/year.

2.2. Procedures

This study was conducted at a large university in a major metropolitan region in New England, and study procedures were approved by the Boston University Campus Institutional review board. Families were recruited via community recruitment flyers and online advertisements, as well as from a child mental health clinic in order to ensure variability across families in child and parent anxiety. Informed consent was obtained in person at the time of each family's lab visit.

During a family's laboratory visit, following initial introduction and general overview of study procedures, the mother was taken to a separate room from her child and she rated her current distress level and negative affect. A modified version of the Maternal Intervention During child Anxiety and Stress (MIDAS) task (Comer & Dick, 2014) was used to evaluate maternal response to child distress and their perceived likelihood of accommodating their child's anxiety. While separated, the mother was told that for a ten-minute period they would sit in front of a monitor while their child in a separate room participated in a trivia task asking a series of questions of varying difficulty levels. The mother was then shown a fingertip pulse monitor, informed that her child would be wearing this fingertip pulse monitor during the trivia task, and was led to believe that this fingertip pulse monitor would capture how stressed the child was in response to each question in the trivia task. The mother was also informed that on their monitor she would be able to view in real time the difficulty level of each question as it was being presented to her child ("*easy*" versus "*difficult*") as well as how stressed her child was by that question. As part of the adapted MIDAS trivia task, the mother was told that the number of questions her child answered correctly would determine how large of a prize her child would get at the end, with difficult questions worth more points.

In actuality, the child was not being asked these questions in the next room (the child was playing games with a research assistant), was not wearing a fingertip pulse monitor, and the information presented to the mother on the monitor regarding the difficulty level of each question and her child's in the moment stress levels were randomly predetermined and generated by a computer program. Questions identified to the mother as having higher difficulty were co-presented to the mother with information that her child was experiencing higher child stress/anxiety. With each question, the mother was provided (bogus) information about her child's stress/anxiety level in the form of a thermometer-shaped visual analogue scale. Temperature levels (continuous) were presented alongside facial expression drawings (low/happy; middle/neutral, high/sad). Following this task, the mother again rated her own distress and affect.

Next, the mother was informed that after a break, her child would repeat the task with a different set of questions of varying levels of difficulty, and that she would again be able to view the difficulty of each "presented" question and the extent to which each question "stressed" her child. Each mother was then randomly assigned to one of two conditions (see "Intervention Conditions," below), after which she again viewed her child's computer simulated "performance" during a second trivia task identical to the first trivia task.

After completion of the task, the mother was debriefed about the actual nature of the task (e.g., the data she was told reflected her child's anxiety/stress was computer generated). The mothers then re-joined her child and both the mother and child were compensated for their participation ($40 given to mother, $20 given to child).

2.2.1. Intervention conditions

2.2.1.1. Experimental group (EXP). Mothers randomized into EXP viewed a 15-minute automated presentation in which cognitive reappraisal was defined and its use as an emotion regulation strategy in the presence of child distress was explained. Examples of using cognitive reappraisal as related to child anxiety were presented (e.g., guiding mothers to adjust thoughts such as "my child cannot handle feeling anxious" to thoughts such as "anxiety is not harmful and their anxiety will only last for a short amount of time"). Other more positive attitudes mothers were encouraged to adopt in place of more maladaptive thoughts included "my child's distress will only last a short amount of time," "anxiety is not harmful to my child," "even though it is hard, it is better for my child to work through the distress." After viewing the presentation, mothers role-played reappraisal strategies with the experimenter in order to practice using this strategy. Mothers were instructed to practice using cognitive reappraisal during the next child trivia task, during which they again would view in real time their child's "distress" level and the difficulty level associated with each question.

2.2.1.2. Control Group (CON). Mothers in the CON group participated in a 15-minute activity in which they received no instructions on how to use any specific strategies to tolerate their own distress in the face of

Table 2
Demographic characteristics and pre-intervention phase variables across experimental and control groups.

	EXP (n = 25*)		CON (n = 22)		Significance Tests
	N	%	*N*	%	
Gender					
Female	12	48.0	12	54.5	χ^2 (1) = .20, p = .65, phi = -.07
Male	13	52.0	10	45.5	
Race					
White	15	60.0	14	63.6	χ^2 (4) = 1.72, p = .79, phi = .19
Asian/Asian American	4	16.0	2	9.1	
Black/African American	2	8.0	3	13.6	
Bi-Racial	3	12.0	3	13.6	
Ethnicity					
Non-Hispanic	24	96.0	21	85.7	χ^2 (1) = .009, p = .93, phi = .01
Hispanic	1	4.0	1	14.3	Fisher's exact test: p = 1.00
Annual Household Income					
0-25,000	4	16.0	2	9.1	
25,001–50,000	1	4.0	2	9.1	χ^2 (6) = 4.14, p = .66
50,001–75,000	2	8.0	5	22.7	phi = .30
75,001–100,000	4	16.0	3	13.6	
100,001–150,000	4	16.0	1	4.5	
150,001–200,000	4	16.0	3	13.6	
> 200,000	6	24.0	5	22.7	
Parent Marital Status					
Married	21	84.0	16	72.7	χ^2 (1) = .89, p = .35, phi = .14
Not married	4	16.0	6	27.3	Fisher's exact test: p = .48
Parent Highest Level of Education					
Completed College	21	84.0	20	90.9	χ^2 (1) = 0.50, p = .48, phi = -.10
Did not complete college	4	16.0	2	9.1	Fisher's exact test: p = .67

	EXP (n = 25*)		CON (n = 22)		*T*-tests
	M	*SD*	*M*	*SD*	
Child Age, years	6.36	1.9	6.50	1.9	$t(45)$ = 0.25, p = .80, d = .07
Mother Age, years	40.00	7.1	38.27	5.1	$t(45)$ = −0.95, p = .35, d = .28
Child Anxiety	53.79	13.3	50.23	10.6	$t(44)$ = −0.99, p = .32, d = .30
Pre-Intervention Accommodation[a]	2.08	1.9	1.86	1.8	$t(44)$ = −0.54, p = .59, d = .12
Baseline NA	11.08	2.0	11.41	1.7	$t(44)$ = 0.60, p = .55, d = .18
Baseline SUDS[a]	1.08	1.5	1.77	1.5	$t(44)$ = 2.00, p = .05, d = .46
Pre-NA	12.29	4.0	11.41	1.7	$t(44)$ = −0.85, p = .40, d = .29
Pre-SUDS[a]	1.88	2.1	1.77	1.8	$t(44)$ = −0.18, p = .86, d = .06

NA = Negative Affect; SUDS = Subjective Units of Distress Scale.
[a] Comparisons conducted on log transformed data (see data analysis). Non-transformed means are presented for ease of interpretability. All other comparisons conducted using raw scores.
* One mother in the experimental group did not complete the intervention.

their child's distress. Rather, in the presentation they were provided a handout on a number of activities which children typically enjoy doing. Mothers were asked to reflect on and write about the types of activities in which their child engages.

2.3. Measures

2.3.1. Sociodemographics

Mothers provided information on parent and child ages, family composition, family demographic variables, and family socioeconomic status (SES).

2.3.2. Child anxiety

For children seven years and above, child anxiety was measured using the total score of the Spence Children's Anxiety Scale for Parents (SCAS-P; Spence, 1999). The SCAS-P is a 39-item parent-report of child anxiety that has demonstrated good internal consistency, convergent validity, and discriminant validity (Nauta et al., 2004). For children younger than seven years, child anxiety was measured using the total score of the Preschool Anxiety Scale-Revised (PAS-R; Spence, Rapee, McDonald, & Ingram, 2001). The PAS-R, a downward extension of the SCAS-P, is a 34-item parent-report of anxiety among preschoolers and has demonstrated good construct reliability and validity (Spence et al., 2001). Internal consistency was strong for both the SCAS-P (Cronbach α = .93) and the PAS-R (Cronbach α = .93). As in previous research using the SCAS-P and the PAS-R for older and younger age groups in a pooled sample (e.g., Kerns et al., 2017), in order to compare child anxiety across the entire sample, SCAS-P and PAS-R scores were converted to standardized scores using published norms, as in previous research (e.g. Kerns et al., 2017).

2.3.3. Maternal perceived likelihood of accommodation of child anxiety

Following each of the two trivia tasks, mothers were asked whether they would, if given the chance, decrease the difficulty level of the questions during the next trivia game, which could decrease their child's stress level, but would also limit the number of points their child could potentially earn. Mothers rated the likelihood that they would decrease the difficulty using a Likert-type scale (0 "not at all" to 7 "very likely).

2.3.4. Maternal affect

Mothers' negative affect (NA) during the child distress task was measured using the NA subscale of the Positive and Negative Affect Schedule (PANAS) (Watson, Clark, & Tellegen, 1988). The PANAS is a widely used 20-item self-report measure designed to assess affect changes in response to mood inductions. The PANAS has demonstrated adequate internal consistency and convergent and divergent validity (Watson et al., 1988). Maternal NA (10 items) was measured at baseline (Baseline NA), immediately following the initial trivia task (Pre-NA), and immediately following the second trivia task (Post-NA). Internal consistency in the current sample was adequate for Baseline NA (Cronbach α = .68), Pre-NA (Cronbach α = .83), and Post-NA (Cronbach α = .70).

Maternal subjective distress was assessed by the Subjective Units of Distress Scale (SUDS) (Wolpe, 1990). SUDS was collected at baseline (Baseline SUDS), following the first trivia task (i.e., pre-intervention; Pre-SUDS) and following the second trivia task (Post-SUDS). SUDS ratings are taken from a scale ranging from 0 (no anxiety) to 10 (extreme anxiety) and have been used in a number of community and clinical settings (Johnco, Wuthrich, & Rapee, 2014; Zvolensky, Lejuez, & Eifert, 1998).

2.3.5. Maternal perceived success in cognitive reappraisal

Mothers in the EXP group were asked to rate how successful they believed they were in using the reappraisal strategy following the second trivia task (scale from 1 to 5, with 1 being "not successful at all" and 5 being "extremely successful").

2.4. Data analysis

Descriptive means and standard deviations were computed for all study variables. Shapiro-Wilk tests of normality indicated that Baseline SUDS, Pre-SUDS, Post-SUDS, and pre- and post-intervention accommodation violated the assumption of normality ($p < .05$). Logarithmic (log) transformations were performed to normalize distributions of these variables. All analyses were run using both transformed and non-transformed variables. In cases where interpretation of results of analyses did not differ in regard to significance ($p < .05$), non-transformed results are presented for ease of interpretability.

To confirm that mothers found the trivia task distressing, a manipulation check was conducted using paired samples *t*-tests to assess whether maternal distress and negative affect scores significantly changed between baseline and pre-intervention (i.e., following first child trivia test). As a manipulation check to ensure successful randomization, independent sample *t*-tests and chi square tests compared means and frequencies across the two intervention groups at baseline and pre-intervention. To examine the effect of the brief intervention on maternal perceived likelihood of accommodation and maternal distress and affect, a mixed between-within subjects analysis of variance (ANOVA) was conducted in which intervention group was considered a fixed between-subjects factor and time was a random within-subjects factor.

3. Results

3.1. Preliminary results

We used Cohen's (1992) guidelines for estimating effect sizes including eta squared, partial eta squared (small = .01, medium = .06, large = .14), and *d* (small = .2, medium = .5, large = .8). Between-groups comparisons (see Table 2) showed no condition differences for any demographic variables or pre-intervention variables, with the close exception of Baseline SUDS, which trended towards significance, $t(44) = 2.00$, $p = .05$, $d = .46$. Accordingly, Baseline SUDS was included as a covariate in subsequent analyses. Results of a paired samples *t*-test suggested that prior to the intervention, maternal subjective distress did not significantly change from Baseline (SUDS $M = 1.41$, $SD = 1.5$) to Pre-Intervention (SUDS $M = 1.83$, $SD = 1.9$), $t(45) = -1.60$, $p = .12$, eta squared = .06, (Baseline SUDS and Pre-SUDS were logged transformed for analyses, but non-transformed means are presented). Similarly, maternal NA did not significantly change from Baseline ($M = 11.24$, $SD = 1.8$) to Pre-Intervention ($M = 11.87$, $SD = 3.2$), $t(44) = -1.48$, $p = .15$), eta squared = .05.

3.2. Intervention effects

To examine the effect of the brief cognitive reappraisal intervention on perceived likelihood of accommodation, a mixed between-within subjects analysis of variance (ANOVA) was conducted in which intervention condition (group) was considered the fixed between-subjects factor and time was the random within-subjects factor (and Baseline SUDS included as a covariate). There was a large effect between group and time, Wilks' Lambda = .83, $F(1, 43) = 8.59$, $p = .01$, partial eta squared = .17, such that EXP mothers exhibited a greater decrease in perceived likelihood of accommodation following the intervention phase compared to CON mothers. Follow-up probing of this interaction found that, whereas CON mothers did *not* show change from pre- to post-intervention ($p = .70$) in perceived likelihood of accommodation (a non-significant simple main effect), EXP mothers *did* show significant reduction in perceived likelihood of accommodation from pre- to post-intervention ($p < .001$).

To examine the effect of the brief cognitive reappraisal intervention on maternal subjective distress, a mixed effects ANOVA was conducted in which intervention condition (group) was considered the fixed between-subjects factor, and time was the random within-subjects factor (and Baseline SUDS included as a covariate). Results indicated a large effect between condition and time, Wilks' Lambda = .84, $F(1, 43) = 8.35$, $p = .01$, partial eta squared = .16, suggesting that SUDS changes across time was not uniform across the two conditions. Specifically, EXP mothers showed greater decreases in distress ratings from pre- to post-intervention phase compared to the CON group. Follow-up probing of the simple main effects found that, whereas CON mothers did *not* show change from pre- to post-intervention ($p = .41$), EXP mothers *did* show significant reduction in subjective distress ($p < .001$).

To examine the effect of the brief cognitive reappraisal intervention on maternal negative affect, a mixed effects ANOVA was conducted in which intervention condition (group) was considered the fixed between-subjects factor, and time was the random within-subjects factor (and Baseline SUDS included as a covariate). In contrast with the significant findings for maternal accommodation and subjective distress, results for negative affect found a small-medium effect for the interaction between condition and time, although it did not reach significance, Wilks' Lambda = .93, $F(1, 43) = 3.22$, $p = .08$, partial eta squared = .07. Results indicated that there was also a small-medium (non-significant) main effect for group ($F(1,43) = 3.67$, $p = .06$, partial eta squared = .08) and time ($F(1,43) = .12$, $p = .74$, partial eta squared = .003), with only a large main effect for baseline SUDS ($F(1,43) = 13.96$, $p = .001$, partial eta squared = .25).

Exploratory tests examining whether child anxiety moderated any

of the significant findings (i.e., whether there were any three-way, condition X time X child anxiety, interactions). Moderation tests were not significant (i.e., Accommodation $p = .69$, partial eta squared = .004; SUDS $p = .52$, partial eta squared = .01), suggesting the intervention effect was uniformly positive across mothers of anxious versus non-anxious children. However, given the small sample size, these results should be interpreted with caution.

4. Discussion

The present study expands upon the small, but growing, literature using experimental methods to examine maternal accommodation of child anxiety, as well the contributing role of maternal beliefs to maternal accommodation patterns (e.g. Feinberg et al., 2018; Kerns et al., 2017; Meyer et al., 2018). The current study incorporated randomization and a novel paradigm to assess maternal perceptions of accommodation likelihood and maternal distress in an ecologically valid manner in a sample of youth with varying levels of anxiety. The present findings suggest that parental training in cognitive reappraisal may lead to reductions in mothers' subjective distress in the face of child distress as well as their perceived likelihood of engaging in accommodation.

Findings from the current study are the first to provide preliminary experimental evidence that targeting negative maternal beliefs about child anxiety and distress may result in maternal belief change. This supports the growing body of literature identifying the role parental beliefs may play in accommodation. Recent findings indicate that parents who believe accommodation reduces the likelihood of their child losing emotional or behavioral control engage in more frequent accommodation (Meyer et al., 2018) and negative parental beliefs about child anxiety may explain the relationship between maternal experiential avoidance and accommodation (Feinberg et al., 2018). The present study expands upon the current literature by demonstrating experimentally that belief change via instruction in cognitive reappraisal can result in reduction in perceived likelihood of accommodation. This suggests that one of the ways in which accommodation may reduce over the course of child anxiety treatment (Kagan et al., 2016), as has been demonstrated in several treatment trials (Comer et al., 2012; Lebowitz, Marin, Martino, Shimshoni, & Silverman, 2019), is through changes in parent beliefs. Parental belief change may happen naturally over the course of treatment, without specific instruction, through participation in sessions and participation in at-home exposure practices, but the present findings suggest that targeted intervention around maternal maladaptive beliefs may be beneficial, especially for mothers who struggle to reduce the level to which they accommodate.

Within an experimental therapeutics framework, this study provides preliminary evidence for the use of maternal beliefs as a lever by which to move accommodation. The fact that a relatively brief cognitive reappraisal intervention, not directly aimed at reducing accommodation, changed mother-rated perceived likelihood of accommodation highlights its potential as a mechanism. Future research should include measures of belief change to test this construct as an appropriate mechanism and test the degree to which effects of similar interventions generalize to non-experimental settings. Examination of parent use of reappraisal over the course of child anxiety treatment may also help elucidate the impact of such a strategy on parental ability, rather than perceived ability, to reduce accommodation.

Moreover, this experimental study was conducted in the context of a single laboratory visit, highlighting the potential utility of brief additional parent instruction in the context of child anxiety treatment. However, most treatments for child anxiety unfold across many sessions and weeks (see Comer et al., 2019; Higa-McMillan, Francis, Rith-Najarian, & Chorpita, 2016). As such, it is not clear whether the present findings would be expected to endure across time, or whether a longer intervention focused on cognitive reappraisal would provide additional gains.

Nevertheless, results hold exciting clinical implications, in that there is preliminary evidence for a more targeted approach in how to potentially help parents reduce accommodation in the context of child anxiety treatment. Many current CBT protocols include parent psychoeducation that may include discussion around the importance of reducing family accommodation (Freeman et al., 2008; Kendall et al., 2008), yet this may be insufficient for parents who hold particularly entrenched and maladaptive beliefs about child distress. Additional instruction in cognitive reappraisal may be one way to help parents change belief patterns that interfere with their own behavior change. Additionally, brief instruction in reappraisal prior to or during exposure practices and/or displays of child anxious distress may have the potential to help parents regulate their emotional response to child distress rather than rely on accommodation to do so. Targeted intervention in this area may also promote faster treatment response. More time engaging in exposures has been shown to predict better treatment response in pediatric OCD populations (Peris et al., 2017), suggesting that targeting parental beliefs early in treatment in the service of decreasing accommodation in order to promote time engaged in exposure may lead to acute positive treatment response, which may reduce risk for chronic anxiety disability (Ginsburg et al., 2018).

These results may also shed light on how one can address parental anxiety in the context of child anxiety treatment. Research suggests that anxious children of anxious mothers fare less well in treatment and that treatment of maternal anxiety does not affect child treatment outcomes, suggesting that targeting maternal anxiety in general may not be enough to change maternal behavior (Creswell, Willetts, Murray, Singhal, & Cooper, 2008; Settipani, O'Neil, Podell, Beidas, & Kendall, 2013). Targeting factors specific to maternal anxiety in the context of mother-child interactions, such as maternal beliefs about child anxiety, may be beneficial in decreasing accommodation and child anxiety.

Despite a number of strengths, including the use of randomization and a novel paradigm, a number of limitations warrant comment. First, the small sample size likely restricted power to detect small-medium effects, particularly in detecting between group differences and the impact of the intervention across anxious and non-anxious children. As such, replication with larger sample sizes is needed to determine the robustness of current findings. Second, participating mothers did not find the trivia task particularly distressing, and thus these findings may not accurately reflect accommodation in the context of maternal distress upon child anxiety. It is possible that participating mothers did not actually believe their child was distressed, despite the provision of child heart rate data, or that the presentation of child heart rate data was not a potent enough indicator of child anxiety to elicit maternal distress. Standardization may also have impacted the ecological validity of the task, such that child distress in the context of the trivia task was not necessarily specific to a given child's anxious presentation. Relatedly, rates of accommodation may differ depending on child anxiety presentation (Lebowitz et al., 2013; Settipani & Kendall, 2017; Thompson-Hollands, Kerns et al., 2014), and given that study participation required mother-child separation, the sample may not be representative of younger anxious children as it may exclude youth with significant separation anxiety.

It is also important to note that although the measure of accommodation during the distress task provides a real-time proxy of maternal behavior, it still relies upon maternal report. Mothers rated the likelihood that they would decrease the question difficulty *if they were given the opportunity*, but this may not reflect actual maternal behavior. Moreover, the degree to which this single-item measure of accommodation predicts broader accommodation patterns remains unclear. Future research should include behavioral observations of parental accommodation.

Additionally, many youth recruited from the mental health clinic had received some form of current or past anxiety treatment, which may have included psychoeducation about accommodation. Given that accommodation has been found to decrease over the course of treatment (Kagan et al., 2016), it is possible that rates of accommodation

and related factors (e.g. parent beliefs about child anxiety) were lower than they would otherwise be in treatment naïve families. That said, families were randomized across the two conditions and thus any treatment-related effects would have presumably washed out across conditions. Further, intervention effects did not differ between mothers of youth with and without current/past treatment history or between mothers of youth recruited from the community and an anxiety clinic (data not shown), although as stated earlier, power was likely restricted to detect differences based on treatment history and recruitment source. Lastly, to reduce variability, only mothers were included in the present study. Incorporating fathers, siblings and other family members will be critical in future studies.

4.1. Conclusion

The present findings indicate that even brief instruction in re-appraisal may result in reduced perception of likelihood of accommodation. Further, these findings provide indirect support for the importance of maternal beliefs in relation to maternal response to child anxious distress. More comprehensive assessment of parental beliefs around parenting and child anxiety/behavior may not only shed light on the development of anxious processes, but also aid in the identification of parents who may benefit from targeted intervention in the context of existing youth anxiety treatments. Future research in larger clinical samples is necessary to better understand the interplay between parent anxiety, beliefs and responses to distress (their own and their child's) in order to identify the role that interventions targeting such processes may have in the effective treatment of child anxiety.

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