Therapist-Reported Features of Exposure Tasks That Predict Differential Treatment Outcomes for Youth With Anxiety

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Objective: Exposure tasks are recognized widely as a key component of cognitive-behavioral therapy (CBT) for child and adolescent anxiety. However, little research has examined specific exposure characteristics that predict outcomes for youth with anxiety and that may guide its application in therapy.

Method: This study draws on a sample of 279 children and adolescents (48.4% male; 79.6% white) with a principal anxiety disorder who received 14 sessions of CBT, either alone or in combination with medication, through the Child/adolescent Anxiety Multimodal treatment Study (CAMS). The present study examines therapist-reported quantity, difficulty level, compliance, and mastery of exposure tasks as they related to CBT response (i.e., Clinical Global Impressions—Improvement ratings). Secondary treatment outcomes included reduction in anxiety symptom severity on the Pediatric Anxiety Inventory, global impairment measured via the Children’s Global Assessment Scale, and parent-report of anxiety-specific functional impairment on the Child Anxiety Impairment Scale.

Results: Regression analyses indicated a dose–response relationship between therapist-reported quantity of exposure and independent evaluations of treatment outcome, with more time devoted to exposure linked to better outcomes. Similarly, greater time spent on more difficult (rather than mild or moderate) exposure tasks predicted better outcomes, as did therapist ratings of child compliance and mastery.

Conclusion: The present findings highlight the importance of challenging children and adolescents with difficult exposure tasks and of collaborating to ensure compliance and mastery.

Key words: anxiety, CBT, treatment, exposure

Interestingly, there have been few direct tests of these tenets for youth with anxiety. Such tests are particularly important in light of growing evidence from the adult literature that many assumptions about exposure may not be supported by the research base. For example, such work finds limited support for the idea that habituation—either within or between sessions—is linked to clinical outcomes for adults or children.

Only 3 studies have examined specific aspects of exposure practice that might predict treatment outcomes for youth anxiety. Hedtke et al. examined youngsters’ use of safety-seeking and adaptive coping behaviors during exposure practice as predictors of outcome for youth receiving individual or family-focused CBT for anxiety. Secondary analyses examined the impact of other exposure characteristics, including peak activation, number of exposure tasks, and time spent on exposure. Safety-seeking behavior during exposure practice was linked to poorer treatment response, and—somewhat surprisingly—practicing fewer exposure tasks per session was linked to better outcomes. In interpreting this finding, the authors speculated that fewer practice tasks allowed clinicians more time to properly plan for and process each exposure. Tiwari et al. examined this possibility systematically using a sample of 61 youth with anxiety and found that time spent processing—but not planning for—exposure predicted more favorable clinical response to CBT: that is, there is therapeutic benefit in taking time post exposure to make sense of the experience. More recently, Peterman et al. found that neither within- nor between-session habituation predicted treatment outcome in a sample of 72 youth with anxiety. Together, these studies speak to the importance of carefully monitoring and preventing escape behaviors or safety-seeking strategies during exposure practice and to the value of thoroughly processing the experience to evaluate the outcome of the exposure task and to consolidate learning. These studies also suggest that narrow focus on habituation during exposure practice may be misguided.

Related work on childhood obsessive-compulsive disorder (OCD) has also examined this issue. Kircanski et al. found that for youth receiving family-focused CBT for OCD, decreases in average level of distress within CBT sessions were linked to better treatment outcome. In a subsequent study, Kircanski and Peris reported that initial fear activation, number of exposure tasks, and between-session habituation were not linked to clinical outcome, building on a growing body of literature challenging the importance of peak activation for improvement. Importantly, however, the type of exposure task mattered, with greater reliance on “compound” (i.e., mixed-target) exposure tasks linked to better outcomes, along with greater distress variability within sessions. Together, these findings offer clinicians ideas for maximizing exposure practice within sessions. The research adds to growing work in developmental neuroscience aimed at better understanding mechanisms of fear learning that might inform exposure practice.

Despite growing interest in this area, extant research has not addressed several issues that may be important for optimizing outcomes, including whether the degree of challenge, child compliance during practice, and child mastery within exposure sessions relate to clinical outcome. Moreover, because extant work has relied on relatively small samples, it has largely overlooked age and gender differences that might inform ways to tailor exposure practice. Finally, research to date has focused solely on links between exposure tasks and reduction in anxiety symptom severity. Aspects of exposure that link to improvements in functional impairment have yet to be examined, an oversight that is important to address, given that exposure tasks specifically target behavioral avoidance that is associated with cross-domain impairments for youth with anxiety.

The present study investigated whether the following aspects of exposure tasks, as reported by therapists, were linked to treatment outcome for youth anxiety: (a) the proportion of sessions devoted to exposure, (b) the proportion of sessions that included high-difficulty exposure, (c) the overall “dose” (quantity and difficulty) of exposure, (d) youth compliance, and (e) youth mastery within exposure sessions, as predictors of CBT outcome. Additionally, sex differences and treatment condition. We expected that more time spent on exposure practice, more time devoted to difficult exposure practice, and higher levels of youth compliance and mastery would each independently predict more favorable CBT response. In addition, because exposure directly targets avoidance that drives functional impairment, we expected these features of exposure to predict greater improvements in both anxiety-specific and global functional impairment.

**METHOD**

**Participants**

The current study used data from the subset of children and adolescents (N = 279; 48.4% male) in the Child/adolescent Anxiety Multimodal treatment Study (CAMS) who were randomly assigned to CBT (Coping Cat; n = 139) or the combination of CBT and sertraline (CBT+SRT; n = 140). Participants had a principal diagnosis of separation anxiety disorder, generalized anxiety disorder, or social phobia based on DSM-IV criteria. They ranged in age from 7 to 17 years (mean = 10.8, SD = 2.8). The sample was predominantly non-Hispanic ethnicity (86.7%). The majority of the sample was white (79.6%, n = 222), followed by African American (9.0%, n = 25), Asian (2.5%, n = 7), American Indian (1.4%, n = 4), Native Hawaiian/other Pacific Islander (<1%, n = 1), and other (7.2%, n = 20). Outside of anxiety disorders, the most common comorbidities were attention-deficit/hyperactivity disorder (ADHD; 10.0%, n = 28), oppositional defiant disorder (ODD; 10.0%, n = 28), and OCD (7.3%, n = 20). CAMS sample characteristics have been detailed in Kendall et al. The rate of attrition in CAMS was low.

**Measures**

**Anxiety Disorders Interview Schedule—Child/Parent Versions.** The Anxiety Disorders Interview Schedule—Child/Parent Versions (ADIS-C/P) is a clinician-administered, semistructured interview that assesses anxiety disorders and common comorbidities in youth. The ADIS-C/P has excellent psychometric properties. Interrater reliability for diagnostic status was examined by reviewing 10% of videotaped assessments in CAMS; intraclass coefficients were excellent, ranging from 0.82 to 0.88.

**Clinical Global Impressions—Improvement.** The Clinical Global Impressions—Improvement (CGI-I) scale is a global rating of
improvement in clinical presentation, ranging from 1 (very much improved) to 7 (very much worse). A CGI-I rating of 1 (very much improved) or 2 (much improved) by an independent evaluator (IE)–designated treatment response.

**Pediatric Anxiety Rating Scale.** The Pediatric Anxiety Rating Scale (PARS)\(^{35}\) is an IE-rated measure of anxiety severity in youth that is administered to the child and parent(s) together. It consists of a symptom checklist and seven global items, each rated on a 6-point scale based on the number and frequency of symptoms, severity of distress, and interference with functioning. In CAMS, 6 global items were summed; 1 item was dropped due to concerns about overlap with medication side effects. The PARS has acceptable reliability and validity.\(^{35}\) Interrater reliability in CAMS was excellent (>0.97).

**Child Anxiety Impact Scale–Parent and Child Versions.** Child Anxiety Impact Scale–Parent and Child Versions (CAIS-P)\(^{36,37}\) is a 27-item parent-report measure of anxiety-related interference in social activities, school, and home/family functioning. The CAIS-P has good internal consistency and validity as measured via linkages to several established anxiety screening measures.\(^{36,37}\)

**Children’s Global Assessment Scale.** Children’s Global Assessment Scale (CGAS)\(^{38}\) is an IE rating (0–100) of youth global functioning; lower scores indicate greater impairment. The CGAS has demonstrated high interrater and test-retest reliability as well as concurrent and discriminant validity.\(^{39}\)

**CBT Session Summary Form.** Data about each session (e.g., attendance; amount of contact with caregivers; goals of the session/degree to which they were accomplished) were recorded by the CBT therapist using the CBT Session Summary Form, developed for CAMS; training to complete the form occurred alongside CAMS CBT training, and recording conventions were reinforced via weekly supervision. Therapists selected the primary and secondary topics for each session from among 15 codes that cover elements of the Coping Cat (or C.A.T. Project for teens) protocol (e.g., coping self-talk; self-evaluation and reward) and distinguished in vivo from imaginal exposure. Therapists also recorded youths’ categorization of exposure targets as easy, medium, or challenging.

Therapists used a 7-point scale to rate the youth’s overall compliance (poor to good), defined as how well the participant completed the requirements of therapy as specified by the therapist (e.g., worked on session assignments) and how engaged he or she was in the treatment process (e.g., whether he or she resisted or dismissed the therapist’s suggestions). Therapists were explicitly instructed to consider compliance independently of improvement or adverse events. Therapists similarly rated how well the participant mastered the information/skill presented during the session, again using a 7-point scale (no mastery to excellent mastery).

**Procedures**

Procedures were approved by the institutional review board at each study site. Pre- and posttreatment measures were administered by IEs blind to treatment condition who were trained to a prespecified reliability standard and monitored for drift. Session summary data were recorded at the end of each CBT session by the therapist. Randomly selected, video-recorded therapy sessions were evaluated for treatment fidelity and had excellent correspondence with the protocol. CAMS design and procedures have been further discussed by Compton et al.\(^{40}\)

**Cognitive-Behavioral Therapy.** CBT participants received fourteen 60-minute sessions delivered over 12 weeks. Treatment followed the Coping Cat protocol\(^{41}\) and was adapted to the youth’s age.\(^{42}\) Coping Cat provides training in skills for managing anxiety (e.g., cognitive restructuring, problem solving; sessions 1–6 in CAMS) and exposure to anxiety-provoking situations (sessions 7–14 in CAMS). Youth were assigned homework to complete between sessions.

Before delivering CBT in CAMS, clinicians participated in a series of didactic trainings followed by written tests, a workshop with the treatment developer, and a full course of closely supervised Coping Cat administration. From there, therapists were carefully supervised via quality assurance checks, weekly on-site and cross-site supervision conference calls, and an annual in-person workshop focused on recalibration training.

**Combination Therapy.** Combination therapy (CBT+SRT) consisted of all components of the CBT and SRT conditions. Pharmacotherapy consisted of eight 30- to 60-minute sessions (weeks 1–4, 6, 8, 12) that involved discussing anxiety symptoms, global functioning, treatment response, and adverse events in the context of supportive care. Pharmacotherapists checked in with participants by phone during weeks when there was no in-person session. Sertraline was administered on a fixed-flexible schedule starting with 25 mg per day and adjusting up to 200 mg per day by week 8. CBT and SRT sessions occurred on the same day whenever possible, and SRT dose increases were determined with input from the CBT therapist.

**Data Analytic Plan**

Regression analyses examined the impact of 5 therapist-reported exposure characteristics on acute treatment outcomes. Exposure characteristics were as follows: (1) percentage of treatment sessions that included exposure exercises; (2) percentage of exposure sessions that included challenging (versus easy or medium) exposure tasks as rated by therapists based on the child’s Subjective Units of Distress Scale ratings/symptom hierarchy; (3) cumulative dose of exposure, calculated by summing the number of in vivo exposure sessions weighted by difficulty level (easy, medium, or hard); (4) average clinician rating of child’s skill mastery during sessions focused on exposure; and (5) average clinician rating of child’s treatment compliance during sessions that focused on exposure. For all regression analyses, variables of interest were centered. Controlling for study site, child gender, child age (dichotomized based on our previous work as age 7–12 years or age 13–17 years), treatment condition (CBT or CBT+SRT), and baseline scores on outcome measures, linear regression analyses examined the impact of each exposure characteristic on IE-rated anxiety severity (PARS) as well as parent-reported, anxiety-specific impairment (CAIS) and IE-rated global impairment (CGAS). Logistic regression evaluated the impact of each exposure characteristic on responder status (with response defined as CGI-Improvement of 1 or 2), controlling for study site, child gender, child age, and treatment condition. Additional regression analyses explored possible 2-way interactions with age, gender, and treatment condition. Given the preliminary nature of this study, an α level of .05 was used.

Of the 279 participants randomized to the CBT and CBT+SRT treatment conditions, 6 participants began CBT in the early stages of the study before the team implemented the session summary form. An additional 19 participants were dropped from all current analyses except those involving percentage of sessions focused primarily on exposure because they did not have any such sessions. A further 13 participants were excluded from analyses examining the impact of the cumulative dose of (in vivo) exposure as a result of having had only imaginal exposure during the course of CBT. Participants had complete data on all other measures except the CAIS-P, which was missing at one time point for <10% of the sample.

**RESULTS**

Among participants who had received exposure, there were no outliers, and skewness and kurtosis were acceptable.
Means and standard deviations for exposure characteristics by responder status are reported in Table 1. The remaining tables present the results of linear regression analyses of exposure characteristics predicting responder status (Table 2), IE-rated anxiety severity (Table 3), and parent-reported functional impairment (Table 4).

The percentage of sessions containing exposure significantly predicted CGI-I responder status, with more exposure practice increasing the likelihood of a positive treatment response (odds ratio [OR] = 217.01, 95% CI [31.00, -999.99]; Wald \( \chi^2 = 29.36, p < .001 \)). Similarly, the percentage of sessions containing exposure also significantly predicted improved treatment outcome measured continuously via PARS anxiety severity (\( b = -8.70, t_{261} = -4.11, p < .001 \)) and IE-rated global functioning (CGAS; \( b = 22.85, t_{261} = 6.06, p < .001 \)) but not parent-rated impairment. Further analyses revealed that the percentage of sessions containing exposure interacted with youth age (7–12 years or 13–17 years) to significantly predict parent-rated impairment (\( b = 18.94, t_{241} = 1.98, p < .05 \)). More specifically, increased focus on exposure, as measured by the percentage of sessions in which exposure was present, was associated with lower levels of functional impairment for children but not adolescents (Figure 1).

The percentage of exposure sessions involving challenging exposure tasks significantly predicted CGI-I responder status (\( OR = 13.27, 95\% CI [2.19, 80.51]; Wald \( \chi^2 = 7.90, p < .01 \)) as did cumulative dose of in vivo exposure (\( OR = 1.11, 95\% CI [1.02, 1.22]; Wald \( \chi^2 = 5.26, p < .05 \)). Neither characteristic predicted posttreatment PARS severity, parent-rated impairment on the CAIS, or IE-rated global functioning. However, exploratory analyses revealed significant interactions between the percentage of exposure sessions involving challenging exposure and treatment condition in predicting CGI-I responder status (Wald \( \chi^2 = 5.79, p < .05 \)) and IE-rated global functioning (CGAS; \( b = 6.82, t_{241} = -2.18, p < .05 \)) such that more challenging exposure was associated with favorable outcomes for CBT+SRT but not CBT (Figure 2).

Therapist ratings of child skill mastery, averaged across exposure sessions, significantly predicted CGI-I responder status (\( OR = 1.99, 95\% CI [1.43, 2.77]; Wald \( \chi^2 = 15.36, p < .001 \)), posttreatment PARS severity (\( b = -1.21, t_{242} = -3.64, p < .001 \)), parent-rated impairment (CAIS; \( b = -2.09, t_{239} = -3.93, p < .001 \)), and IE-rated global functioning (CGAS; \( b = 2.67, t_{242} = 4.48, p < .001 \)). Further analyses revealed that child skill mastery interacted with treatment condition to predict parent-rated impairment (\( b = -2.05, t_{238} = -2.07, p < .05 \)) such that the negative relationship was stronger for CBT than for CBT+SRT (Figure 3).

A similar pattern of results emerged for therapist ratings of child treatment compliance, averaged across exposure sessions. Greater compliance from the child significantly increased the likelihood of positive treatment response on the CGI-I (\( OR = 2.26, 95\% CI [1.66, 3.07]; Wald \( \chi^2 = 26.71, p < .001 \)). Compliance also significantly predicted posttreatment anxiety severity (PARS; \( b = -1.16, t_{239} = -3.80, p < .001 \)), parent ratings of the child’s impairment due to anxiety (CAIS; \( b = -1.68, t_{242} = -3.46, p < .001 \)), and IE-rated global functioning (CGAS; \( b = 2.64, t_{239} = 4.86, p < .001 \)) in expected directions.

**TABLE 1** Means and Standard Deviations for Exposure Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n</th>
<th>Total Sample (CBT and CBT+SRT) Mean (SD)</th>
<th>Treatment Responders Mean (SD)</th>
<th>Treatment Nonresponders Mean (SD)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of sessions with any exposure</td>
<td>273</td>
<td>46 (16)</td>
<td>50 (10)</td>
<td>37 (23)</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Percentage of exposure sessions with difficult exposure</td>
<td>254</td>
<td>34 (18)</td>
<td>36 (17)</td>
<td>29 (22)</td>
<td>.03</td>
</tr>
<tr>
<td>“Cumulative dose” of exposure</td>
<td>241</td>
<td>8.84 (4.07)</td>
<td>9.23 (3.91)</td>
<td>7.56 (4.38)</td>
<td>.01</td>
</tr>
<tr>
<td>Mastery during sessions in which exposure was primary focus</td>
<td>254</td>
<td>5.37 (1.10)</td>
<td>5.57 (1.04)</td>
<td>4.75 (1.04)</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Compliance during sessions in which exposure was primary focus</td>
<td>254</td>
<td>5.68 (1.17)</td>
<td>5.96 (1.97)</td>
<td>4.82 (1.34)</td>
<td>&lt;.0001</td>
</tr>
</tbody>
</table>

Note: The maximum number of sessions per individual was 14. “Cumulative dose” refers to the sum of in vivo exposure sessions weighted by difficulty level (easy, medium, hard), with a range of possible scores being 0 to 42; mastery range of possible scores was 1 to 7; compliance range of possible scores was 1 to 7. CBT = cognitive-behavioral therapy; SRT = sertraline.
TABLE 2 Logistic Regression Analyses of Exposure Characteristics Predicting Responder Status (Clinical Global Impressions—Improvement)

<table>
<thead>
<tr>
<th>Exposure Characteristic</th>
<th>b</th>
<th>SE</th>
<th>Wald χ²</th>
<th>Adjusted Odds Ratio</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of sessions containing exposure</td>
<td>5.38</td>
<td>0.99</td>
<td>29.36***</td>
<td>217.01</td>
<td>30.96 – &gt;999.99</td>
</tr>
<tr>
<td>Percentage of exposure sessions containing difficult exposure × Treatment condition</td>
<td>-4.99</td>
<td>2.07</td>
<td>5.79*</td>
<td>.01</td>
<td>&lt;.01 – .39</td>
</tr>
<tr>
<td>Cumulative dose of in vivo exposure</td>
<td>0.11</td>
<td>0.05</td>
<td>5.26*</td>
<td>1.11</td>
<td>1.02 – 1.22</td>
</tr>
<tr>
<td>Average mastery</td>
<td>0.69</td>
<td>0.17</td>
<td>16.36***</td>
<td>1.99</td>
<td>1.43 – 2.77</td>
</tr>
<tr>
<td>Average compliance</td>
<td>0.81</td>
<td>0.16</td>
<td>26.71***</td>
<td>2.26</td>
<td>1.66 – 3.07</td>
</tr>
</tbody>
</table>

Note: Control variables (omitted from table) were study site, child age, child gender, and treatment condition. Interactions that were not significant are not reported in this table.

*p < .05, **p < .01.

These findings add to an emerging empirical literature that tests many long-held beliefs about the optimal methods for implementing exposure. In particular, the findings support the importance of prioritizing exposure tasks within CBT sessions, revealing a positive link between the number of sessions in which exposure is practiced and favorable outcome. This link appears to be especially important for younger children, whose developmental level may limit the benefit of cognitive restructuring, another critical element of treatment. Similarly, the current findings point to the value of challenging youth with more difficult exposure, particularly within the context of combined CBT and pharmacotherapy. Together, these findings add to a growing emphasis from both clinical and basic learning research on tailoring exposure practice to meet the specific needs of the child. Such work has identified features such as cue, context, and developmental status as important in shaping fear learning.

Experts have long emphasized the importance of exposure, however, 2 prior studies examining quantity of exposure as a predictor of CBT outcome yielded mixed results, with 1 study suggesting that 1 good exposure was akin to several lesser ones and the other study finding no link whatsoever. It may be the case that our large, well-powered sample was better suited to detecting these effects. Certainly, consistent practice of exposure tasks—particularly that which is wisely and thoughtfully implemented—could be expected to help consolidate new learning for youth with anxiety. Although it is possible that youngsters who were likely to improve, or were already improving, were simply willing to complete a greater number of and/or more challenging exposure tasks, there are several other possible explanations for the finding that exposure difficulty predicts treatment outcomes. It may be that challenging exposure tasks are needed to activate the fear response when youth are taking anxiety-reducing medication, or that challenging exposure tasks provide youth with more rigorous tests of their assumptions about feared situations/stimuli, and thus, more opportunity for the exposure task outcome to contradict their expectations and facilitate new learning. It may also be that the greater the presented challenge, the greater the corresponding positive impact on the youth’s sense of coping and mastery, features that have been found to mediate outcomes. Finally, it may be the case that more difficult tasks reflect a strong therapeutic relationship in which youth feel supported in taking on new challenges.

The present findings underscore the importance of process variables inasmuch as they point to therapist reports of youth compliance and mastery within sessions as consistent

### TABLE 3 Linear Regression Analyses of Exposure Characteristics Predicting Independent Evaluator-Rated Anxiety Severity (Pediatric Anxiety Rating Scale [PARS])

<table>
<thead>
<tr>
<th>Exposure Characteristic</th>
<th>b</th>
<th>SE</th>
<th>t</th>
<th>F</th>
<th>df</th>
<th>Adjusted R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of sessions containing exposure</td>
<td>-8.70</td>
<td>2.12</td>
<td>-4.11***</td>
<td>9.20***</td>
<td>10, 261</td>
<td>0.23</td>
</tr>
<tr>
<td>Percentage of exposure sessions containing difficult exposure</td>
<td>-1.76</td>
<td>1.94</td>
<td>-0.91</td>
<td>8.01***</td>
<td>10, 242</td>
<td>0.22</td>
</tr>
<tr>
<td>Cumulative dose of in vivo exposure</td>
<td>0.05</td>
<td>0.10</td>
<td>0.52</td>
<td>7.60***</td>
<td>10, 240</td>
<td>0.21</td>
</tr>
<tr>
<td>Average mastery</td>
<td>-1.21</td>
<td>0.33</td>
<td>-3.64***</td>
<td>9.66***</td>
<td>10, 242</td>
<td>0.26</td>
</tr>
<tr>
<td>Average compliance</td>
<td>-1.16</td>
<td>0.30</td>
<td>-3.80***</td>
<td>10.21***</td>
<td>10, 239</td>
<td>0.27</td>
</tr>
</tbody>
</table>

Note: Control variables (omitted from table) were study site, child age, child gender, treatment condition, and baseline PARS.

***p < .001.
predictors of outcome. Youth compliance is likely facilitated by fostering the youth’s active involvement within session (Crawford et al., unpublished, 2017). Such an approach allows a clear understanding of the rationale for exposure, along with open collaboration with therapists. In many cases, it is enhanced by reward systems or additional incentive plans that reinforce youth for trying their best. Mastery may be enhanced by allowing youth to practice the same exposure multiple times, again testing whether expected outcomes occur or whether these individuals can tolerate distress that they previously found unbearable. This repetition may be particularly important after exposure tasks that do not go as well (or as planned), as youth learn to regroup, persist, and eventually prevail. Through all of these endeavors, the quality of the therapeutic relationship is likely to be important for harnessing engagement.

Several limitations merit mention. First, our predominantly non-Hispanic white demographic may limit generalization. Second, we relied on therapist report of exposure characteristics. Although the session summary sheets completed by therapists provided valuable information about in-session activities, we were unable to consider other exposure variables that may be important (e.g., initial/peak activation, in-session habituation) and formal psychometrics are unavailable; thus it is possible that therapists’ ratings

### Table 4

<table>
<thead>
<tr>
<th>Exposure Characteristic</th>
<th>b</th>
<th>SE</th>
<th>t</th>
<th>F</th>
<th>df</th>
<th>Adjusted R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of sessions containing exposure</td>
<td>-9.48</td>
<td>4.84</td>
<td>-1.96</td>
<td>7.61***</td>
<td>10, 244</td>
<td>0.21</td>
</tr>
<tr>
<td>× Age group</td>
<td>18.94</td>
<td>9.54</td>
<td>1.98*</td>
<td>7.36**</td>
<td>11, 243</td>
<td>0.19</td>
</tr>
<tr>
<td>Percentage of exposure sessions containing difficult exposure</td>
<td>-3.26</td>
<td>3.17</td>
<td>-1.03</td>
<td>6.88***</td>
<td>10, 239</td>
<td>0.20</td>
</tr>
<tr>
<td>Cumulative dose of in vivo exposure</td>
<td>-0.13</td>
<td>0.16</td>
<td>-0.80</td>
<td>5.74***</td>
<td>10, 237</td>
<td>0.24</td>
</tr>
<tr>
<td>Average mastery</td>
<td>-2.09</td>
<td>0.53</td>
<td>-3.93***</td>
<td>8.73***</td>
<td>10, 239</td>
<td>0.25</td>
</tr>
<tr>
<td>× Treatment condition</td>
<td>-2.05</td>
<td>0.99</td>
<td>-2.07*</td>
<td>8.43***</td>
<td>11, 238</td>
<td>0.26</td>
</tr>
<tr>
<td>Average compliance</td>
<td>-1.68</td>
<td>0.48</td>
<td>-3.46***</td>
<td>8.73***</td>
<td>10, 237</td>
<td>0.27</td>
</tr>
</tbody>
</table>

Note: Control variables (omitted from table) were study site, child age, child gender, treatment condition, and baseline CAIS-P. *p < .05; **p < .01; ***p < .001.

Even among clinicians who self-identify as cognitive-behavioral in orientation, there is a tendency to exclude exposure from treatment or to incorporate incompatible techniques. Community therapists’ reservations about exposure—including its potentially negative impact on the therapeutic alliance—have been tested and debunked but have still been linked to its underuse and suboptimal delivery. Critically, these features can be modified through quality training, and the current findings bolster the rationale for emphasizing exposure in treatment for anxiety.

Several limitations merit mention. First, our predominantly non-Hispanic white demographic may limit generalization. Second, we relied on therapist report of exposure characteristics. Although the session summary sheets completed by therapists provided valuable information about in-session activities, we were unable to consider other exposure variables that may be important (e.g., initial/peak activation, in-session habituation) and formal psychometrics are unavailable; thus it is possible that therapists’ ratings

### Figure 1

Interaction between percentage of sessions containing exposure and age. Note: CAIS-P = Child Anxiety Impact Scale—Parent.
FIGURE 2  Interaction between percentage of exposure sessions containing difficult exposure and treatment condition. Note: CBT = cognitive-behavioral therapy; CGAS = Children’s Global Assessment Scale; COMB = combination of medication and CBT.

were influenced by their perceptions of client symptom improvement. That said, the therapist was uniquely positioned to provide ideographic data (e.g., accounting for the possibility that one individual’s easy exposure is another individual’s difficult exposure) by considering the youth’s perception of exposure in the context of all available information from his/her full course of therapy. Third, because treatment in CAMS was administered on a closely monitored schedule, there was relatively little variability in the timing of when exposure was first implemented. Future work could focus on examining features of exposure tasks implemented in community clinics. Although homework completion was not related to outcomes in CAMS, future research could consider the possibility that between-session dose of exposure affects outcome; it might also consider other variables previously found to be important for outcome, including safety-seeking behavior during exposure practice. Finally, given the potential for type I error,

FIGURE 3  Interaction between therapist-rated mastery during exposure and treatment arm. Note: CAIS-P = Child Anxiety Impact Scale—Parent; CBT = cognitive-behavioral therapy; COMB = combination of medication and CBT.
exploratory analyses suggesting differential impact of exposure characteristics by age and treatment condition should be replicated.

Despite these limitations, the present findings are consistent with many current guidelines regarding effective exposure practice. They underscore the value of prioritizing exposure practice within session, and of challenging youth with difficult practice tasks. Perhaps most importantly, they point to the value of working collaboratively with children and adolescents to enhance compliance and mastery. Future laboratory-based research should complement these findings by experimentally manipulating exposure characteristics to establish their causal impact on treatment outcome.

Dr. Compton served as the statistical expert for this research. The authors gratefully acknowledge the children and families who participated in this research.

Disclosure: Dr. Peris has received research funding from the National Institute of Mental Health and the Society of Clinical Child and Adolescent Psychology and book royalties from Oxford University Press. Dr. O’Rourke has received funding from Mission Inc., the National Institute of Mental Health, NC GlaxoSmithKline Foundation, and the North Carolina Sickle Cell Syndrome Program. Dr. Kendall has received research support from the National Institute of Mental Health. He has received honoraria from professional societies for speaking at conventions. He has received royalties from Guildford Press, Ericsson, Workbook Publishing (this spouse’s employment), and Oxford University Press. Dr. Walkup has received past research support from the National Institute of Mental Health for federally funded studies including free drug and placebo from Pfizer in 2007 to support the Child Adolescents’ Anxiety Multi-modal study, free medication from Abbott in 2005 for the Treatment of the Early Age Media study, free drug and placebo from Eli Lilly and Co. in 2003 for the Treatment of Adolescents with Depression study. He currently receives research support from the Tourette Association of America and The Hartwell Foundation. He has served as an unpaid advisor to the Anxiety Disorders Association of America and The Trichotillomania Learning Center. He has received honoraria and travel expenses for speaking engagements and meetings sponsored by the Tourette Association of America. He has received royalties from Guildford Press and Oxford University Press for multi-author books published about Tourette syndrome and from Wolters Kluwer for CME activity on childhood anxiety. He has served as a paid speaker for the Tourette Syndrome—Center for Disease Control and Prevention outreach educational programs, the American Academy of Child and Adolescent Psychiatry, and the American Psychiatric Association. Dr. Albano has received royalties from Oxford University Press, including use of the ADIS. However, the ADIS was provided at no cost for this study and CANS. She has received honoraria from the American Psychological Association. Dr. McCracken has served as a consultant to Think Now and Alcobra. He has received a research contract with Pyramid, and his spouse has received a grant from the Werck Foundation. Dr. Birmaher has received research support from the National Institute of Mental Health. He has or will receive royalties from Random House, Inc., Lippincott Williams and Wilkins, and UpToDate. Dr. Sokolsky has received research funding from the National Institute of Mental Health and the National Alliance for Research on Schizophrenia and Depression. She has received consulting fees from IKB Consulting in 2015. Dr. Piacentini has received grant or research support from the National Institute of Mental Health, the Petit Family Foundation, the Tourette Association of America, the Tic Foundation for Body-Focused Repetitive Behaviors, and Pfizer Pharmaceuticals. He is a co-author of the Child OCD Impact Scale—Revised (COSR), the Child Anxiety Impact Scale—Revised (CAIS), the Parent Tic Questionnaire (PTQ), and the Premoritory Uirge for Tics Scale (PUTS) assessment tools, all of which are in the public domain therefore no royalties are received. He has served as a consultant for an NIH RO1 grant at the University of Michigan. He has received honoraria and travel support for lectures at academic institutions and from the Tourette Association of America and the International Obsessive Compulsive Disorder Foundation for behavior therapy trainings. He has received royalties from Guildford Press and Oxford University Press. Dr. Compton has received research support from the National Institute of Mental Health, NC GlaxoSmithKline Foundation, Pfizer, and Mursion, Inc. He has served as a consultant for Shire and Mission, Inc. He has received honoraria from the Journal of Consulting and Clinical Psychology, Nordic Long-Term OCD Treatment Study Research Group, and the Centre for Child and Adolescent Mental Health, Eastern and Southern Norway. He has served on the scientific advisory board of Tourette’s Association of American and Mission, Inc. He has given expert testimony for Duke University. Drs. Capozzoli, Bergman, and Ginsburg report no biomedical financial interests or potential conflicts of interest.

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0890-8567/36.00/© 2017 American Academy of Child and Adolescent Psychiatry

https://doi.org/10.1016/j.jaac.2017.10.001

Clinical Guidance

- Findings reveal a positive link between the number of sessions in which exposure is practiced and more favorable treatment outcome, underscoring the importance of this particular treatment technique. This appears to be especially important for younger children, whose developmental status may limit the benefit of cognitive restructuring, another critical element of treatment.
- Findings point to the value of challenging youth with more difficult exposure tasks (rather than those that the child perceives as easy), particularly within the context of combined cognitive-behavioral therapy (CBT) and pharmacotherapy.
- Youth compliance and mastery of exposure tasks predicted clinical response, underscoring the importance of collaborating with youth to understand the reasoning behind exposure practice and repeating/revisiting specific tasks to ensure a sense of mastery.
REFERENCES

