The role of day-to-day emotions, sleep, and social interactions in pediatric anxiety treatment

Meredith L. Wallace [a, b], Dana L. McMakin [c, *], Patricia Z. Tan [d], Dana Rosen [e], Erika E. Forbes [a], Cecile D. Ladouceur [a], Neal D. Ryan [a], Greg J. Siegle [a], Ronald E. Dahl [f], Philip C. Kendall [g], Anthony Mannarino [h], Jennifer S. Silk [e]

[a] Department of Psychiatry, University of Pittsburgh, 3811 O'Hara Street, Pittsburgh, PA 15260, USA
[b] Department of Statistics, University of Pittsburgh, 230 South Bouquet Street, Pittsburgh, PA 15260, USA
[c] Department of Psychology, Florida International University, 11200 S. W. 8th Street, Miami, FL 33199, USA
[d] Department of Psychiatry, University of California, 757 Westwood Plaza, Los Angeles, CA 90095, USA
[e] Department of Psychology, University of Pittsburgh, 210 South Bouquet Street, Pittsburgh, PA 15260, USA
[f] School of Public Health, University of California, 50 University Hall, Berkeley, CA 94720, USA
[g] Department of Psychology, Temple University, 1701 North 13th Street, Philadelphia, PA 19122, USA
[h] Allegheny General Hospital, Four Allegheny Center, Pittsburgh, PA 15212, USA

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ABSTRACT

Do day-to-day emotions, social interactions, and sleep play a role in determining which anxious youth respond to supportive child-centered therapy (CCT) versus cognitive behavioral therapy (CBT)? We explored whether measures of day-to-day functioning (captured through ecological momentary assessment, sleep diary, and actigraphy), along with clinical and demographic measures, were predictors or moderators of treatment outcome in 114 anxious youth randomized to CCT or CBT. We statistically combined individual moderators into a single, optimal composite moderator to characterize subgroups for which CCT or CBT may be preferable. The strongest predictors of better outcome included: (a) experiencing higher positive affect when with one's mother and (b) fewer self-reported problems with sleep duration. The composite moderator indicated that youth for whom CBT was indicated had: (a) more day-to-day sleep problems related to sleep quality, efficiency, and waking, (b) day-to-day negative events related to interpersonal concerns, (c) more DSM-IV anxiety diagnoses, and (d) college-educated parents. These findings illustrate the value of both day-to-day functioning characteristics and more traditional sociodemographic and clinical characteristics in identifying optimal anxiety treatment assignment. Future studies will need to enhance the practicality of real-time measures for use in clinical decision making and evaluate additional anxiety treatments.

1. Introduction

Anxiety disorders in youth are disabling (Langley, Bergman, McCracken, & Piacentini, 2004) and costly (Bodden, Dirksen, & Bögels, 2008; Greenberg et al., 1999), have a chronic course that does not typically remit without treatment (Hudson, Kendall, Coles, Robin, & Webb, 2002; Kovacs & Devlin, 1998), and have unwanted functional outcomes (Swan & Kendall, 2016). There is strong empirical support for the use of cognitive behavioral therapy (CBT) for treatment of pediatric anxiety (James, Soler, & Weatherall, 2005; Kendall, Hudson, Gosch, Flannery-Schroeder, & Suveg, 2008; Ollendick, Jarrett, Grills-Taquechel, Hovey, & Wolff, 2008; Walkup et al., 2008; Weisz, Weiss, Han, Granger, & Morton, 1995). However, CBT requires specialized therapist training, and CBT therapists are not easily accessible in all communities. As such, broad dissemination efforts are needed, but have proven challenging (Southam-Gerow, Rodríguez, Chorpita, & Daleiden, 2012).

For some anxious youth, supportive psychotherapy approaches

that draw on core non-specific therapeutic ingredients may be sufficient in treating anxiety. To evaluate the efficacy of supportive psychotherapy approaches for youth with PTSD, in comparison with more active CBT approaches, Cohen and colleagues developed Child-Centered Therapy (CCT), a manualized supportive psychotherapy for anxious youth. CCT draws on principles from client-centered therapy, which is widely used in the community (Cohen, Deblinger, Mannarino, & Steer, 2004). CCT includes an emphasis on active listening, reflection, accurate empathy, and encouragement to talk about feelings, but unlike CBT does not include directive problem solving, psychoeducation about anxiety and coping skills, or exposure. CCT was previously used as an active comparison condition for trauma-focused CBT for youth with PTSD to account for effects of attention and therapeutic alliance (Cohen, Mannarino, & Iyengar, 2011; Cohen, Mannarino, & Knudsen, 2005; Cohen et al., 2004). It was also an active comparison condition for CBT for youth with anxiety in the sample from which the current study is based (Silk et al., 2016). Findings from these previous comparisons of CBT versus CCT indicated that both treatments provided improvement pre-to post-treatment, but that CBT was superior to CCT in long-term outcomes.

Given the advantages and disadvantages of both CBT and CCT, it will be important to identify and characterize youth for whom CBT is likely to result in a preferable outcome over supportive therapy CCT, and vice versa. One of the first steps in understanding who will benefit from CBT and/or supportive treatments like CCT is to identify predictors (pretreatment characteristics associated with outcome, regardless of treatment) and, more importantly, moderators of treatment response. Moderators are pretreatment characteristics that are independent of treatment assignment and which indicate a different treatment effect depending on the value of that characteristic (Kraemer, 2013). For example, Compton et al. (2014) found that type of anxiety diagnosis moderated treatment outcome for anxious youth. CBT was preferable to both sertraline and placebo for youth with generalized anxiety disorder (GAD), similar to both sertraline and placebo for youth with separation anxiety disorder (SAD), and less preferable to sertraline but similar to placebo for youth with social anxiety disorder (SocAD).

A problem with individual moderators is that they are often very weak and inconsistent across studies (Compton et al., 2014). Furthermore, if multiple moderators are identified they can provide contradictory treatment indications for the same youth. For example, if type of anxiety diagnosis and age were both identified as moderators, it is possible that a single youth may be indicated for one treatment based on their anxiety diagnosis and a different treatment based on their age, thereby offering no practical treatment recommendation. To address this problem, a novel method for optimally combining individual moderators was recently developed and demonstrated (Kraemer, 2013; Wallace, Frank, & Kraemer, 2013). This method integrates information from multiple potentially weak and/or contradictory individual moderators into a single, stronger, combined moderator that can provide a clear indication of the treatment on which a youth will have a preferable outcome through a weighted prediction algorithm. After rigorous validation, an optimal combined moderator could provide personalized anxiety treatment by indicating which youth could receive effective treatment through supportive community psychotherapy such as CCT, and which should be encouraged to seek out CBT (e.g., through the use of a hand-held computer).

Existing studies of childhood anxiety treatment have searched for individual predictors and moderators (rather than combining them), and have focused largely on sociodemographic, clinical, and family climate measures obtained in a clinical setting (Knight, McLellan, Jones, & Hudson, 2014; Lundkvist-Houndoumadi, Hougaard, & Thastum, 2014). Although these traditional pre-treatment

characteristics have been considered in numerous studies, relatively few consistent recommendations have emerged (Herres, Cummings, Swan, Makover, & Kendall, 2015; Knight et al., 2014; Lundkvist-Houndoumadi et al., 2014). Severity of primary diagnosis appears to be one of the most robust predictors (Berman, Weems, Silverman, & Kurtines, 2000; Compton et al., 2014). Type of anxiety disorder was revealed to be an important predictor and moderator of treatment effect in more recent studies (Compton et al., 2014; Crawley, Beidas, Benjamin, Martin, & Kendall, 2008; Hudson et al., 2015) but earlier studies provided little conclusive evidence of such effects (Lundkvist-Houndoumadi et al., 2014). Similarly, comorbid diagnoses including depressive and externalizing disorders were important in some studies (Crawley et al., 2008; Knight et al., 2014; Rapee et al., 2013; Liber et al., 2010) but not others (Kerns, Read, Klugman, & Kendall, 2013; Rapee, 2003; Shortt, Barrett, & Fox, 2001). Family psychopathology (Berman et al., 2000; Bodden et al., 2008; Compton et al., 2014; Hudson et al., 2015; Schleider et al., 2015; Southam-Gerow, Kendall, & Weersing, 2001) and age (Bodden et al., 2008; Southam-Gerow et al., 2001) have also been identified as predictors, albeit somewhat inconsistently (Bennett et al., 2013; Kendall & Peterman, 2015; Knight et al., 2014).

Although clinical and sociodemographic characteristics captured in a clinical setting may be important, anxious youth also have difficulty with aspects of *day-to-day* functioning, including emotional reactivity and regulation, social interactions, and sleep (Walz, Nauta, & aan het Rot, 2014; Willis & Gregory, 2015). Anxiety treatments such as CBT and CCT aim to help youth generalize improvements beyond the clinic and enhance day-to-day functioning in a youth's life. However, retrospective questionnaire measures about daily functioning are subject to recall and rater biases, may not sufficiently capture nuances in the quality of social and emotional functioning, and also cannot tap into the complex dynamic emotional processes that anxious youth experience. Thus, real-time measures of day-to-day functioning merit consideration as predictors and moderators of treatment outcome. Prior research suggests that the mean and variability of day-to-day negative and positive emotions (Forbes et al., 2012; Mor et al., 2010), emotional reactivity and regulation in response to negative events (Tan et al., 2012), parental and social interactions (Beidel, Turner, & Morris, 1999; Guyer et al., 2008; Oppenheimer et al., 2016), and sleep (Alfano, Pina, Zerr, & Villalta, 2010; Brent et al., 2008; Cousins et al., 2011; McMakin & Alfano, 2015; McMakin et al., 2016) play important roles in the daily lives of anxious youth. Both objective and subjective measures of day-to-day sleep are important to consider, as findings based on these two measurement types do not always correspond in youth with anxiety (Alfano, Patriquin, & De Los Reyes, 2015) or adolescents more generally (Short, Gradisar, Lack, Wright, & Carskadon, 2012).

The present study used data from the Child Anxiety Treatment Study (CATS), a randomized trial comparing two active therapies (CBT and CCT) for young adolescents with anxiety disorders (Silk et al., 2016). CATS employed ecological momentary assessment (EMA), daily sleep diaries, and actigraphy to capture emotions, events, social interactions, and sleep in the youth's naturally-occurring social context. Using these data, we (1) explored predictors of treatment outcome, and (2) demonstrated the feasibility and potential utility of a recently developed "optimal combined moderator" statistical approach to identify and characterize subgroups of youth who may have a preferable outcome with CBT or, conversely, CCT. We use these results as a platform to generate hypotheses for potential ways to enhance and personalize anxiety treatment in youth.