

Cognitive Behavioral Treatment of Comorbid Anxiety Disorders and Social Difficulties in Children with High-Functioning Autism: A Case Report

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Abstract A substantial proportion of children with high-functioning autism (HFA) or Asperger syndrome (AS) have one or more comorbid anxiety disorders. Because anxiety disorders exacerbate the social difficulties and other functional impairments caused by an autism spectrum disorder (ASD), there is a need for efficacious treatments to address the clinical needs of youth with this comorbid presentation. This article describes an evidence-based cognitive behavioral therapy (CBT) treatment manual enhanced to address the unique characteristics and clinical needs of children with ASD. A case study is presented in which CBT was utilized in the successful treatment of an 11-year-old girl with HFA. The intervention was effective in reducing anxiety and improving social and adaptive functioning. These findings suggest that an enhanced CBT approach may be a viable intervention for children with comorbid HFA and anxiety disorders that should be further evaluated.

Keywords Autism · Anxiety · CBT

Introduction

The efficacy of cognitive behavioral therapy (CBT) for child anxiety disorders has been well supported in the evidence-based treatment literature. While CBT is widely endorsed for the treatment of anxiety in typically developing children, there is currently limited empirical

evidence regarding its application to children with the broader phenotype of autism spectrum disorders (ASD), including high-functioning autism (HFA), Asperger syndrome (AS), and pervasive developmental disorder not otherwise specified (PDD-NOS). The purpose of this article is to discuss an expanded and modified family-oriented CBT intervention based on the *Building Confidence* CBT treatment manual (Wood, Piacentini, Southam-Gerow, Chu, & Sigman, 2006), adapted to address the unique treatment needs of children with ASD. A case report is presented to illustrate the details of the treatment and the effects of enhanced CBT on anxiety, social adjustment, and adaptive functioning in a child with ASD.

Literature Review

The vague diagnostic boundaries between HFA, AS, and PDD-NOS have resulted in scholarly debates and an upsurge of clinical and research interest in the higher-functioning realm of ASD (e.g., Klin, Pauls, Schutlz, & Volkmar, 2005; Volkmar & Klin, 2000). Regardless of the nosological status of these diagnostic subtypes, verbal and high-functioning individuals on the autism spectrum are typically of at least normative intelligence and exhibit severe and persistent impairments in social communication skills such as reciprocity, initiation of interactions, maintenance of eye contact, ability to share enjoyment, empathy, and the ability to infer interests of others (APA, 2000; Bellini, 2004).

Anxiety disorders have been reported in approximately 35% of the ASD population (e.g., Green, Gilchrist, Burton, & Cox, 2000; Kim, Szatmari, Bryson, Streiner, & Wilson, 2000; Leyfer et al., 2006; Muris, Steerneman, Merckelback, Holdrinet, & Meesters, 1998). Anxiety problems can be

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debilitating to individuals with ASD (Greig & MacKay, 2005; Klin et al., 2005; Sofronoff & Attwood, 2003), often posing an additional barrier to children's overall adjustment by adversely affecting school performance, peer relationships, and family functioning, and further exacerbating ASD-related impairments (e.g., Bellini, 2004). For example, in a recent study of children with ASD, subjects with higher anxiety levels exhibited more deficits in social skills (Bellini, 2004). Given the high prevalence of comorbid anxiety in youth with ASD and its likely consequences, the development of efficacious treatments to address anxiety-related symptoms in the ASD population is needed (Attwood, 2003a; Leyfer et al., 2006; Volkmar & Klin, 2000). Such interventions, if successful for anxiety, might also have a positive influence on other aspects of functioning—such as social skills—that are adversely affected by anxiety.

Components of Effective Treatment

One logical approach to developing treatments for children with ASD and comorbid anxiety disorders is to capitalize on decades of evidence-based psychotherapy research on typically developing (non-ASD) children with clinical anxiety. The extant literature strongly supports the use of CBT as the treatment of choice for child anxiety disorders because it has consistently yielded positive results across several randomized clinical trials (e.g., Kendall et al., 1997). Traditional CBT for child anxiety is comprised of two phases: (1) skills training (children are taught coping skills such as relaxation, cognitive restructuring, and self-reward) and (2) application and practice (children practice their skills by ascending a hierarchy of increasingly feared situations). Furthermore, an accumulating body of literature on family cognitive behavioral therapy (FCBT) suggests that CBT may be especially efficacious when the family is actively included in treatment (e.g., Barrett, Dadds, & Rapee, 1996; Cobham, Dadds, & Spence, 1998; Wood et al., 2006).

The *Building Confidence* FCBT manual (Wood & McLeod, in press) was originally developed with typically developing school-aged children with anxiety disorders to promote more extensive clinical improvement than is sometimes attained by working solely with the child. Parent training is an essential component of the program, focusing on parenting skills, family communication, and use of behavioral techniques to encourage children's adaptive functioning and independence. Descriptions of the original *Building Confidence* program have been published elsewhere (e.g., Wood et al., 2006). In a recent clinical trial on this FCBT program, about 80% of children receiving the treatment no longer met criteria for a *DSM-IV* anxiety

disorder at post-treatment, as diagnosed by an independent evaluator using a structured interview (Wood et al., 2006). With such positive initial indications of efficacy for typically developing children, the *Building Confidence* model offers a good basis for the development of a treatment to meet the clinical needs of children with comorbid ASD and anxiety disorders. Given that deficits in adaptive functioning (e.g., self-help skills) are common among children with ASD (Liss et al., 2001; Volkmar et al., 1987), it was hypothesized that the program's strong emphasis on children's independence and self-sufficiency would be naturally compatible with and especially pertinent to this population.

Despite a wealth of empirical evidence favoring CBT for the treatment of anxiety in typically developing children, the potential role of CBT in the treatment of children with HFA/AS/PDD-NOS is just beginning to be evaluated (e.g., Reaven & Hepburn, 2003). Several ASD-related clinical features, such as deficits in social communication (Marans, Rubin, & Laurent, 2005), theory of mind or perspective taking skills (Baron-Cohen, Leslie, & Frith, 1985; Baron-Cohen et al., 2005), and understanding of emotions and social cues (Bauminger & Kasari, 2000; Sigman & Ruskin, 1999), are likely to interfere with the delivery of traditional CBT for children with ASD. Therefore, additions and modifications to typical CBT are most likely necessary in order to effectively address comorbid anxiety symptoms in children with HFA and AS (e.g., Attwood, 2003a, 2004).

In an initial randomized controlled trial of program for children with AS, Sofronoff and her colleagues (Sofronoff, Attwood, & Hinton, 2005) compared children in a waitlist control group to children in two variants of a 6-week group CBT program focusing on emotion recognition and cognitive restructuring. Although participating children were not diagnosed with anxiety disorders at pretreatment per se, parent-report measures nonetheless showed declines in child anxiety symptoms in the CBT groups compared to the waitlist group. In this trial, typical CBT procedures were modified in an attempt to accommodate the cognitive profile of children with AS, including additional emphasis on affective education, special interests, and graphical presentation of core concepts.

This article describes the successful treatment of an 11-year-old girl with HFA and three comorbid anxiety disorders using a manual-based FCBT intervention adapted for children with ASD from the empirically supported *Building Confidence* program. This case study illustrates the use of an enhanced, multimodal CBT program to promote coping and adaptation in youth with ASD who have a profile of comorbid anxiety, and suggests that this treatment modality may be beneficial in improving several areas of youth functioning.

Because the *Building Confidence* program is flexible in nature and employs a modular format, the clinician can provide therapy techniques that are individually tailored to the needs of specific children and their families. This is especially pertinent to the modified and expanded version of the program for children with HFA/AS, given the heterogeneity of ASD symptomatology. Figure 1 illustrates the clinical decision tree for the child and parent treatment modules in this program, based on a range of possible modules for children with ASD and comorbid anxiety disorders presenting with different treatment needs and symptom expression.

Case Description

Sophie is a charming, humorous 11-year old girl with a diagnosis of HFA living with her biological parents and two younger sisters in a rural area of southern California. She was referred to participate in a pilot study of CBT because her anxiety symptoms interfered significantly with her social and family functioning. Her parents both had working class occupations, but were able to drive to the clinic for treatment on a weekly basis.

Clinical Profile

Sophie was initially diagnosed with autistic disorder at 7 years of age by the local school district. At clinic intake at age 11 years, she met criteria for autistic disorder on the Autism Diagnostic Observation Schedule—Module 3 (ADOS; Lord, Rutter, DiLavore, & Risi, 1999) and the Autism Diagnostic Interview—Revised (ADI-R; Lord,

Rutter, & LeCouteur, 1994) administered by trained clinic personnel. At the time of her participation in our CBT program, Sophie attended a special day class in the fifth grade of her local public elementary school. She received weekly speech and language therapy. Sophie received neither medications nor additional psychosocial treatments other than occasional counseling from the school psychologist on an as-needed basis.

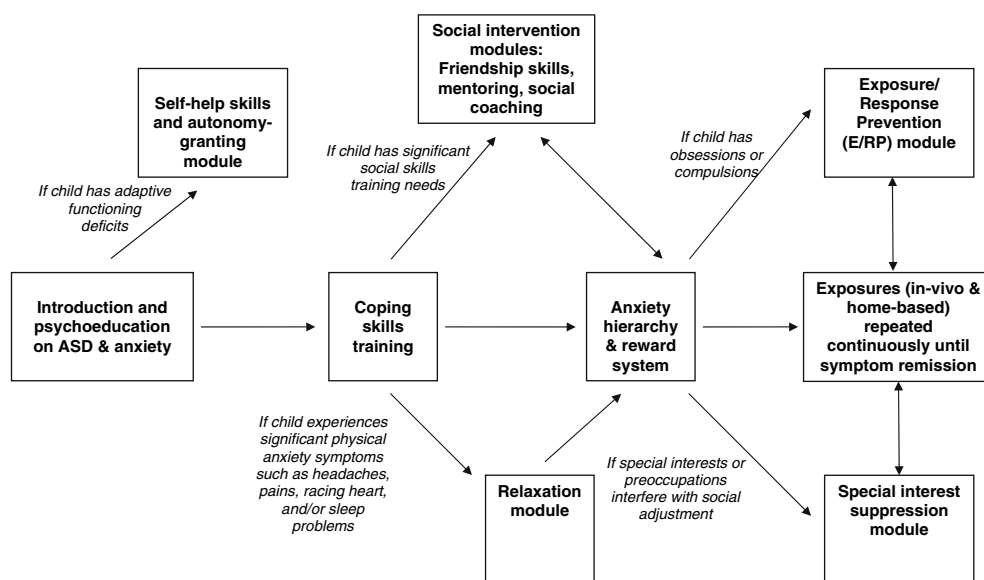
Assessments

At pre-treatment, Sophie and her mother were each administered comprehensive diagnostic measures, including the Anxiety Disorders Interview Schedule for DSM-IV: Parent and Child versions (ADIS-C/P; Silverman & Albano, 1996), a semi-structured interview that yields reliable diagnoses of anxiety disorders administered by a trained diagnostician unaware of Sophie's receipt of treatment.

Diagnostic Formulation

At pretreatment, Sophie met criteria for Autism (per the ADOS and ADI-R), Separation Anxiety Disorder (SAD), Generalized Anxiety Disorder (GAD), and Obsessive Compulsive Disorder (OCD). Sophie exhibited a variety of HFA symptoms covering the main areas of social communication deficits, unusual use of language, and restricted interests and stereotypies. Of particular note with regard to her most pressing HFA-related clinical needs, Sophie had a longstanding history of peer rejection at school, did not have any friends in or out of school, and had limited contact with other children. Her mother reported that this was largely due to her inappropriate social behaviors

Fig. 1 Clinical decision tree for FCBT modules



(e.g., monologues on her special interests). She avoided social interactions by spending recess and lunch alone in the library or walking around the playground by herself. Sophie never had playdates or informal get-togethers with peers. In terms of adaptive self-help skill deficits, Sophie did not use knives, put away personal possessions, or use the telephone. Sophie's mother also assisted her with private self-help tasks such as shaving her arms and legs in the shower.

Turning to her comorbid psychiatric symptom profile, Sophie experienced many pervasive anxieties. Sophie was very reluctant to go places without her parents or have them go places without her, called them repeatedly (as many as 20 times per day) while they were away, and carried several bags containing "security items" with her at all times (she believed that she might need them in case she was kidnapped or her parents were killed). Due to separation anxiety, Sophie typically would enter her parents' room to sleep in their bed at some point during the night, an unusual behavior for an 11-year-old girl in her community. Sophie's parents experienced a great deal of stress from the amount of effort devoted to adapting the family's routines to accommodate Sophie's separation anxiety and related dependent behaviors. Sophie was also frequently distressed by worries about numerous topics *unrelated* to separation from her parents. These symptoms included worries about performance (e.g., being good enough in the school chorus), her health and her family's health, and the war in Iraq. Sophie also worried about making mistakes and humiliating herself in front of others, often for days or weeks preceding the event. These worries were frequent, intense, and hard to stop once they began. When preoccupied by such worries, Sophie avoided doing tasks expected of her (e.g., homework, household chores), which became a point of contention for the family, and her younger siblings would imitate Sophie and refuse to complete their chores.

Sophie and her mother reported a variety of obsessive thoughts and compulsive behaviors at pre-treatment, attaining criteria for OCD. Sophie's mother reported that Sophie had an intense interest in movies produced in the 1980's (e.g., *Star Wars*, *Indiana Jones*) and specific teen celebrities (referred to by Sophie as "The Sisters"). She spent a substantial amount of time each day "incessantly" discussing, drawing, and writing notes about her preferred topics. Although her preoccupation with such topics was due to autism, the content of her thoughts was often distressing, which is characteristic of OCD rather than ASD. For example, Sophie experienced intrusive, upsetting thoughts about choking her favorite teen celebrity upon viewing a poster that depicted the actress smoking. Other obsessive thoughts reported by Sophie and her mother focused on possible contamination, saying bad words, losing

possessions (despite no evidence that this had happened or would happen), and thoughts about harming others (e.g., urges to suffocate people like the "bad guy" in *Indiana Jones*). According to her mother, Sophie would have a temper tantrum when she thought she had misplaced an item, and her distress about losing possessions was so intense that the family typically stopped all activities to assist her with locating the item. Sophie also frequently checked her possessions and hoarded many useless items, including old toothbrushes, worn clothing, and broken jewelry, resulting in piles of disorganized clutter in her bedroom. Her mother described her compulsive hoarding as the behavior that interfered most with the family's functioning and daily routines, as she experienced considerable stress from constantly helping Sophie to manage the clutter from her hoarding and negotiating with her to discard items from the "museum collection."

Sophie's Treatment Using an Enhanced CBT Manual for Children with ASD

Sophie and her mother were seen by the treating clinician (K.M.S., supervised by J.J.W.) for sixteen 90-minute sessions over the course of 4 months. The 90-minute FCBT sessions allow for sufficient time for meeting with the child, the parent(s), and both together. The evidence-based *Building Confidence* FCBT treatment manual (Wood & McLeod, in press) was extended and modified for the treatment of children with ASD and comorbid anxiety-related symptoms, targeting psychiatric symptomatology, social difficulties, and adaptive self-help skills (Wood, Drahota, & Sze, 2007). The following sections describe the enhanced treatment manual and its use in working with Sophie.

Sessions 1–3: Skills Training and Focus On Independence Skills

The initial sessions of CBT focus on providing psychoeducation regarding the symptoms of autism and anxiety—how different behaviors the child engages in reflect autism or an anxiety disorder. This psychoeducation is linked with the goals of the program (to overcome the barriers posed by these disorders and "fight back against autism and anxiety"; cf. Piacentini, Langley, Roblek, Chang, & Bergman, 2003) and is intended to increase child and parent motivation, offer a clear description of what specific problems are going to be targeted (to help families become aware of symptoms and monitor for change), and build commonality with the patient and family.

During early sessions, Sophie often became preoccupied by her special interests and reverted to discussions of

preferred topics (e.g., the life of Harrison Ford), which made it difficult to cover the content of the session (i.e., “active ingredients” of CBT) while still maintaining rapport. Additionally, due to difficulties with abstract language characteristic of many individuals with ASD, Sophie was challenged by concepts requiring meta-cognition such as thinking about her own thoughts. However, several key additions and modifications to the original *Building Confidence* manual helped overcome these barriers.

Consistent with the work of other researchers (Anderson & Morris, 2006; Attwood, 2003a, 2004; Reaven & Hepburn, 2003), key modifications to *Building Confidence* that facilitate the comprehension of concepts such as “icky thoughts” (catastrophic cognitions), “calm thoughts” (cognitive restructuring) and “knowing when I’m nervous” (emotion recognition) for children with ASD include reduced emphasis on abstract spoken language, greater use of role playing and visual materials, illustration of key concepts in simplified terms using the child’s special interests as examples or metaphors, and using a lively, interactive (rather than didactic) style (Wood et al., 2007). For instance, in a typical session with Sophie, the therapist presented coping skills in the context of a topic that appealed to Sophie (e.g., imagining Harrison Ford in a dangerous situation in a movie) and eliciting her participation by drawing scenarios that featured cartoon characters corresponding to her special interests. Only then would the therapist guide the activity towards a CBT concept (e.g., what icky thoughts would he have; what kind of calm thoughts could help him?) that could be anchored visually by drawing thought bubbles on the cartoon and writing in appropriate responses generated by an enthusiastic Sophie based on the therapist’s Socratic questioning. Additionally, discussions incorporated her preference for particular words and phrases (e.g., being a “pre-teen”) that elicited positive emotion, pride, and a good therapeutic alliance. Cognitive restructuring exercises focused on teaching Sophie to challenge her worries about her parents’ safety (e.g., “My mom has never been in a car accident”) and losing her possessions (e.g., “Nothing terrible would happen if I don’t have all my stuff”). Driven by her high level of enthusiasm and rapport, Sophie demonstrated rapid progress with the acquisition of these coping skills.

Another goal addressed in the initial parent-focused sessions of the enhanced CBT program (Wood et al., 2007) pertains to the child’s self-help skills. This is a treatment focus unique among current CBT programs for children and is especially relevant to youngsters with ASD given that adaptive skill deficits are a *DSM-IV* criterion for autism. Sophie’s mother was encouraged to gradually reduce the level of assistance she provided to Sophie in daily routines and to offer her choices (rather than give commands or do tasks for her) whenever possible. A plan was

then made for Sophie to try out three self-help tasks that she was *capable of but was not consistently performing* on her own (e.g., placing laundry into the hamper). The plan was presented to Sophie as a means of “becoming more grown up like a real preteen,” to which she responded with great enthusiasm. She quickly mastered these tasks, proudly informing the therapist of her accomplishments each session. The therapist added new tasks (e.g., shaving on her own) as the treatment progressed.

Sessions 4–5: Development of the Treatment Plan and Hierarchy

The next phase of the enhanced CBT program involves the development of the treatment plan for the remainder of therapy. Research on CBT for anxiety disorders in typically developing youth has demonstrated the crucial role of a hierarchy with small incremental steps that lead children towards proficiency in new desired behaviors (and eradicating unwanted ones) to guide the implementation of exposure therapy (e.g., Kendall et al., 1997). Hierarchy items focus on child behaviors in “real life” (in vivo) situations at home and in the community, and not just in the therapy room. Extending this fundamental CBT technique to the treatment of children with ASD and comorbid anxiety, *all* relevant ASD (e.g., social and special-interest related), anxiety, and other ancillary psychiatric symptoms are considered in the development of the hierarchy in our enhanced CBT approach (Wood et al., 2007). The development of such a hierarchy is a fairly complex matter that requires careful training and supervision for a therapist to master. Hierarchies in the treatment of children with comorbid ASD and anxiety disorders may have to address 15–30 or more symptoms and goals. Though daunting to novice therapists, such hierarchies create a clear “road-map” for the remainder of treatment and spell out goals in specific terms that help all parties determine whether progress is being made. During the hierarchy session, the child uses a visual “feelings thermometer” that consists of cartoon faces depicting a range of distress, to assign subjective difficulty and/or fear ratings to each scenario on the symptom hierarchy (e.g., on a scale of 0–10). Table 1 shows some of the items on Sophie’s hierarchy developed at Session 4; the reader is invited to compare these goals with the presenting clinical symptoms described above to understand how the latter guides the former.

To maintain motivation, Sophie and her mother devised a simple point system to track completed CBT homework assignments. Points allowed her to accrue a variety of highly desired items and activities, including *Indiana Jones* trinkets, videos to rent, and special outings with her family. Rewards systems are a separate module in FCBT and can increase child participation in exposures.

Table 1 Examples of Sophie's Symptom Hierarchy

Symptom area	Target goals
Separation anxiety	Staying at grandparents' house for 1 h without calling parents Staying at grandparents' house overnight with only one telephone call to parents Sleeping in own bed throughout the night without entering parents' bedroom
Generalized worries	Refraining from asking questions about mother's health, 1 h. Refraining from asking questions about mother's health, all day Watching the news or reading an article about the war, then drawing a picture about it
Obsessions and compulsions	Leaving several security items with therapist for "safekeeping" Bringing items from the "museum collection" to UCLA and discarding them in session
Social/Friendship	Playing and eating with target peer(s) at recess and lunch Initiating a telephone call to a target peer Inviting a target peer over for a playdate, acting as a good host
Special interests	Refraining from discussing special interests during a playdate Refraining from discussing <i>Indiana Jones</i> from after school until bedtime

Sessions 6–15: Skills Application and Practice with Parent Support; Friendship Skills Training; School-Based Peer Intervention

Exposure therapy is a central treatment component employed during this phase of treatment. Exposure therapy involves systematically and repeatedly exposing a willing and well-prepared child to situations and stimuli listed on the hierarchy to establish familiarity, competence, and/or habituation. For Sophie, initial targets chosen from the hierarchy included eradicating co-sleeping, suppressing ASD-related "special interests" in conversations, developing comfort with being away from her parents, refraining from repetitive questioning about worries, and eliminating compulsive hoarding. Successful exposure therapy requires beginning with tasks from the hierarchy that are rated by the child as fairly "easy" to increase the chance of early success.

Sophie's first task during this application/practice phase was staying in her own bed throughout the night without entering her parents' room. Despite initial reluctance, a problem-solving dialogue with Sophie about possible forms of coping self-talk (calm thoughts) that emphasized her increasing autonomy (cf. her "preteen" status) proved sufficient in successfully remitting this symptom. By the following session, she had slept independently in her own bed on a nightly basis, requiring only a brief bedtime ritual with her mother, with low anxiety. This rapid elimination of co-sleeping was also attributable to her mother's consistent use of communication techniques taught during parent sessions intended to facilitate the development of Sophie's sense of confidence and autonomy (e.g., labeling feelings, allowing Sophie to feel upset without rushing to comfort her, giving her choices).

Another key goal in Sophie's hierarchy was reducing her separation anxiety when away from her parents. This was initially accomplished by reducing the number of times she phoned her parents when they were away, a scenario she rated as moderately high on the feelings thermometer. Sophie was assigned the homework exposure of spending time at her grandparents' house and gradually decreasing the number of telephone calls she made to her parents. The early sessions of skill building proved critical in helping Sophie successfully overcome her separation anxiety: she immediately generated numerous coping thoughts (e.g., "I love my grandparents and there's nothing scary about staying with them") and a reasonable plan of action (e.g., finding alternate enjoyable activities, writing down questions for her mother and asking them later). By session 8, Sophie proudly informed the therapist that she was staying overnight at her grandparents' without calling her parents (a scenario she now rated as easy). Her anxiety about being away from parents rapidly subsided (to *no* anxiety on 0–10 scale) and she soon self-initiated the additional exposure of walking home alone from school. Both behaviors and worries pertaining to separation anxiety were essentially eliminated within three sessions of carefully chosen exposures, and they did not reemerge during the remainder of therapy.

Sophie's fear of losing possessions and compulsive hoarding were treated concurrently. Although she was initially reluctant to decrease the number of security items she carried with her (i.e., rated as extremely difficult on the anxiety scale), she agreed to "practice losing things" in session and at home. For example, as an easy first exposure, she was asked to select a few items at the beginning of the session and leave them outside the

therapy room for the remainder of session. She then worked towards allowing her mother to keep her favorite items for several days, eventually letting the therapist keep them in her office until the following session. Sophie soon began self-initiating the time spent away from her favorite items. By session 13, she no longer experienced distress when items were misplaced (e.g., “My stuff has been here for over a week and I’ve been doing okay,” “It’s no big deal with I lose my stuff”). A similar plan was created to challenge Sophie’s hoarding-related thoughts and systematically engage her in the anxiety-provoking task of discarding. Sophie worked on developing coping self-talk around hoarding (e.g., “I’ve never used any of this stuff”) and sorted items from her “museum collection” into organized boxes to eventually discard them. By gradually learning to tolerate the anxiety elicited by temporary “separations” from her possessions, and seeing that “nothing bad happens,” Sophie built up the self-confidence and appropriate positive self-talk to eliminate her hoarding behavior and monitoring/checking on her favorite possessions.

A few modifications were made to traditional CBT techniques to reduce the intensity of Sophie’s generalized worries. In Sophie’s case, the use of *humor* and *ASD-related special interests* in cognitive restructuring proved instrumental in the successful reduction of irrational worries (Anderson & Morris, 2006; Attwood, 2003a, 2004). For example, during an imaginal exposure involving the war in Iraq, Sophie was asked to reproduce, through drawing, a war scene from a magazine article she had read. In lieu of directly challenging her anxious cognitions, however, the therapist asked her to create a scene that depicted Indiana Jones “saving the day.” Although this modified presentation of cognitive restructuring involved the use of special interests rather than actual coping self-talk, Sophie responded favorably with much humor and, in subsequent weeks, reported no remaining anxiety about the war in Iraq (because she often thought of this humorous “solution” to the war and subsequently developed a helpful corollary thought that she was just a pre-teen for now and it was the grown-ups’ job to solve the problem). A similar approach was taken to treat other GAD symptoms on her hierarchy and resulted in a marked reduction in Sophie’s complaints of worry.

Sophie’s intense preoccupation with certain perseverative interests (e.g., Harrison Ford) manifested as a barrier to friendships and dominated family conversations (e.g., her interactions with her mother mainly involved discussing her special interests). The therapist held a collegial discussion with Sophie about the likely negative impact of her perseverative behavior on her social interactions (e.g., “People get bored because they don’t care about *Indiana Jones* as much as I do”) and peer relationships, coupled

with reminders about the incentive program. The rationale of a *suppression* approach was then presented to her as a plan for “making closer friends.” Suppression was illustrated in a concrete manner through the pictorial depiction of cartoon characters using thought and speech bubbles in social situations. Sophie developed coping self-talk to suppress discussion of her perseverative topics when in the company of others, such as “Harrison Ford is for staying inside my head (a thought bubble), not for saying out loud (a speech bubble) during my playdate.”

As an additional visual reminder, Sophie was introduced to a simple self-monitoring strategy in which she wore about 10 plastic bracelets on her left wrist and transferred a bracelet from one wrist to the other each time she “slipped up” and brought up a perseverative interest. By session 13, this technique proved effective in reducing the intensity of Sophie’s preoccupation with her special interests during social interactions with others. She became quite accurate in discerning the appropriateness of a situation to discuss her preferred topics. Additionally, she reported that she no longer experienced distressing worries about celebrities “destroying themselves.”

To further address Sophie’s functional impairment related to her lack of friends at home and at school, friendship skills training was initiated with her and her mother. After extensive practice and role-playing in session, Sophie agreed to invite a same age peer (the daughter of her mother’s best friend) over for a first playdate. She tried very hard to implement the target friendship skills (e.g., giving the guest choices, discussing topics of interest to the guests) during initial playdates with this peer. Her mother provided occasional subtle reminders for Sophie to refrain from discussing *Indiana Jones* and *The Sisters* (referred to as “doing UCLA homework”) before and during playdates, leading to rapid mastery of playdate skills. By session 14, Sophie spontaneously initiated playdates with two other girls from school, which soon became reciprocal. Her mother noted significant improvements in Sophie’s friendships over the course of the program. Additionally, the playdates hosted by Sophie were positively received by her peers and their parents.

To directly target school peer relationships, the therapist asked teachers for nominations of peers who were “empathic,” “kind,” and “prosocial.” These peers were trained to approach and invite Sophie to join their playgroups during recess and lunchtime. Training followed a “Peer Buddy Training Outline” script (Wood et al., 2007) we have successfully used with other children. Specifically, peers learn to initiate positive social interactions, such as including the child in conversations (e.g., by initially discussing his/her preferred topics). For Sophie, because there were many (five) willing and interested peers, a “buddies

timetable” was established in which each peer was assigned one day per week to be a buddy to Sophie during recess. Within one week, Sophie reported with excitement and genuine surprise that she had been invited to play by a different friend each day at recess, a qualitatively different experience from her typical lonely recesses spent walking around aimlessly or retreating to the library. Further, she successfully generalized her “suppression” strategies to interactions with her peer buddies during recess and made active efforts to expand her repertoire of interests. Sophie’s mother noted that she began expressing interest in a variety of age-appropriate topics (e.g., recent television shows, popular music) introduced to her by her peers.

Session 16: Termination

The final session involved a review of all the techniques taught over the course of treatment, particularly coping skills, suppression strategies, and friendship skills. Sophie was praised for the progress she made (as evidenced by the significant decreases in her subjective anxiety ratings on the symptom hierarchy) and was reminded to use the skills she learned when faced with challenging situations in the future. Sophie indicated that she no longer felt worried about “most things” and was immensely proud of the new friends she had made since participating in the program.

Treatment Outcome

At post-treatment, assessment results suggested that Sophie no longer met criteria for SAD, GAD, or OCD. In the structured diagnostic interview (ADIS-C/P) conducted by an independent evaluator, neither Sophie nor her mother endorsed any separation or social worries. Sophie’s mother reported that she experienced mild anxiety about school-work and the weather, but it no longer caused interference for Sophie. According to her mother, Sophie experienced occasional obsessions about an actor but was generally successful in stopping or changing the thoughts on her own. Large gains were also made on parent-report measures of anxiety, social skills, and adaptive functioning. Sophie’s mother also expressed “superior” satisfaction with the treatment on an acceptability questionnaire. She reported that the demands of the treatment were very acceptable, length and duration were appropriate, and that Sophie’s presenting problems had greatly improved. We held one booster session for this patient, although we did not collect any formal follow-up data. On a qualitative note, the patient appeared to have maintained treatment gains and did not report any significant anxiety at the booster session. She was in the process of transitioning to middle school at the time.

Discussion

The results of this case report lend initial support to the efficacy of the modified *Building Confidence* FCBT manual for the treatment of children with ASD and comorbid anxiety disorders. Over the course of treatment, Sophie’s SAD, GAD, and OCD symptoms remitted with significant improvement in multiple areas of functioning at home, socially, and at school. At the end of treatment, Sophie stated that she no longer “floated around with worries,” willingly went places without carrying security items, and felt comfortable being away from her parents. As a result of learning CBT skills, Sophie was routinely able to give herself helpful “pep-talks” (i.e., actively engage in cognitive restructuring independently) when she detected an increase in her anxiety level. These positive outcomes, in conjunction with other preliminary findings in the treatment of anxiety in school-age children with ASD (Reaven & Hepburn, 2003; Sofronoff et al., 2005), suggest that CBT may well be a meritorious treatment modality for youth with ASD that is worthy of more extensive study.

In addition to anxiety reduction, the current case study extends the literature by demonstrating that modifications to traditional CBT protocols may also be efficacious in facilitating the social adjustment and adaptive functioning in children with ASD. Prior to treatment, Sophie did not have friends and actively avoided social interactions. At post-treatment, she had established reciprocal friendships with three girls from school with whom she regularly had playdates, informal get-togethers, and telephone conversations. The addition of modules targeting ASD-specific social deficits to enhance traditional CBT may prove critical in improving social awareness and reciprocal peer interactions in children with HFA. In Sophie’s case, she gradually amassed appropriate social skills through friendship skills training, parent-mediated social coaching, and implementation in one-on-one playdates with typical peers. Further, as a result of the peer buddy intervention, she had additional opportunities to apply the friendship skills she learned in session by practicing positive interactions with peers at school. The inclusion of such peer-focused interventions is deemed critical for high-functioning children with ASD who are often caught in a vicious cycle of social isolation (Bauminger, 2002; Kasari, Chamberlain, & Bauminger, 2001).

Perhaps one of the most important implications from this case is the issue of managing circumscribed or perseverative interests in children with HFA and AS, a distinct and enduring characteristic of the autism spectrum. Due to the ego syntonic nature of circumscribed interests, research indicates that they often can and should be incorporated constructively into treatment (Attwood, 2003b; Baker, Koegel, & Koegel, 1998; Charlop-Christy &

Haymes, 1998). A unique feature of Sophie's treatment involved the systematic management of her perseverative interests: these topics were initially incorporated into the skill-building phase of CBT and then eventually "suppressed" during the practice and application phase. Due to the pleasure Sophie derived from discussing her preferred topics, initially acknowledging and engaging around her unusual interests was particularly helpful in maintaining her motivation and facilitating her acquisition of core CBT concepts early on in treatment (cf. Reaven & Hepburn, 2003). She was gradually introduced to the rationale that her circumscribed interests acted as a *barrier* to social contact (e.g., Attwood, 2003b). Capitalizing on her above average cognitive abilities and motivation for social involvement, treatment focused on teaching Sophie to consciously and systematically suppress discussion of her special interests in the presence of others. This innovative approach was helpful in decreasing the intensity of Sophie's preoccupation with her special interests and their effects on social adjustment—core areas of impairment in ASD.

A number of factors may have contributed to the positive and rapid response to treatment in Sophie's case. Classical and operant conditioning procedures combined with psychoeducation and coping skills training appeared to be the active ingredients in treatment, as would be expected based on other research on CBT for typically developing children (e.g., Kendall et al., 1997). However, specific modifications and accommodations appear necessary to adapt CBT for the ASD population. We have highlighted several of these in this case study, which were aimed at either helping the patient access and engage in therapy, or to modify standard CBT strategies to target core ASD symptoms.

First, the treatment employed Sophie's personal strengths and several aspects of her core ASD symptoms to maintain motivation, which is often deficient in children with autism (e.g., Baker et al., 1998). Deliberate use of Sophie's idiosyncracies, special interests, and preference for visual stimuli appeared to be instrumental in treatment. We found that capitalizing on these symptoms, rather than fighting against them, resulted in the development of positive emotion, pride, and a good therapeutic alliance. As discussed above, special interests were incorporated in most sessions as examples, in role-plays, in the development of coping self-talk, and in casual conversation. Although these same interests also became a behavior management target related to suppressing perseverative speech, strategic use of Sophie's preoccupations throughout therapy maintained her high level of interest in each aspect of treatment, potentiating her rapid progress and optimistic treatment outcomes. In similar fashion, Sophie's intensive picture drawing was channeled in a therapeutic

direction by using her sketches to illustrate coping skills and prepare for in vivo exposures. Finally, although friendship skills training and peer buddy interventions have not been used in prior CBT programs, these behavioral interventions employ techniques that dovetail nicely with CBT (e.g., skill building, role playing, modeling, in vivo practice) and synchronize well with the treatment hierarchy and rewards system. These specific techniques appeared to be instrumental in addressing Sophie's ASD-related peer relationship problems.

Second, the success of the treatment was likely facilitated by the mother's active involvement and consistency in following through with home-based exposures. As part of the program's overarching focus on parent training, Sophie's mother learned to employ CBT techniques to increase her daughter's independence and ensure completion of home-based exposures. Her ability to consistently and flexibly incorporate such techniques into routine parent-child interactions increased Sophie's "dosage" of CBT by providing therapeutic support to Sophie in critical day-to-day situations when anxiety and social problems were experienced. Recent research on the treatment of anxiety in typically developing children indicates that treatment is often more efficacious when augmented with a parent training component (e.g., Barrett et al., 1996; Wood et al., 2006). Given the problems with generalization in ASD and the emphasis on parent education in ASD-specific interventions (National Research Council, 2001), parental involvement would appear to be especially important in the delivery of psychosocial interventions for children who have both ASD and anxiety (Reaven & Hepburn, 2003, 2006; Sofronoff et al., 2005).

Due to the high rates of co-occurrence of anxiety disorders among youth with autism (e.g., Green et al., 2000; Kim et al., 2000), there is a clear need for the development of efficacious treatments for this dually diagnosed population. This case study illustrates the potential value of an enhanced, multimodal CBT intervention with additions and modifications to account for ASD-specific characteristics and treatment needs. While a randomized clinical trial to determine the efficacy of this CBT approach is currently under way in our laboratory, this case report provides preliminary evidence for the use of CBT in addressing both psychiatric comorbidity and aspects of core ASD symptoms in school-aged children.

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