

CBT for Adult ADHD: Adaptations and Hypothesized Mechanisms of Change

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Attention-deficit/hyperactivity disorder (ADHD) was formerly thought to be exclusively a disorder of childhood. However, research has indicated that a majority of individuals diagnosed with ADHD will continue to exhibit clinically significant symptoms in adulthood. Many other individuals may not have their symptoms recognized and diagnosed until facing difficulties in adulthood. Medications are the most effective single treatment for individuals with ADHD of all ages. However, medications alone may represent insufficient treatment for many adults with ADHD. Consequently, various adjunctive treatments for adult ADHD have been developed, with cognitive behavioral therapy (CBT) emerging as a particularly promising one. The goal of this article is to discuss how CBT has been adapted in light of the prevailing model of dysfunction for ADHD and to propose hypothesized mechanisms of change that may produce the positive therapeutic changes obtained in clinical outcome studies.

Keywords: adult attention-deficit/hyperactivity disorder (adult ADHD); ADHD; cognitive behavioral therapy (CBT); executive functions; mechanisms of change; psychosocial treatment

Attention-deficit/hyperactivity disorder (ADHD) is a neurodevelopmental disorder characterized by developmentally inappropriate levels of inattention, hyperactivity, and impulsivity. ADHD is estimated to affect 3% to 7% of school-aged children in the United States (American Psychiatric Association, 2000). Longitudinal studies of children and adolescents with ADHD tracked into adulthood indicate that persistence rates based on DSM diagnostic criteria might underestimate actual persistence of impairment associated with the disorder. For example, “syndromatic” persistence rates of ADHD into adulthood fall around 40% while “symptomatic” persistence rates, reflecting ongoing residual symptoms and functional impairment, fall in the 65% to 90% range (Faraone, Biederman, & Mick, 2006; Kessler et al., 2005).

Research on the life outcomes of adults with ADHD has revealed that ADHD is associated with a profile of persistent difficulties affecting most domains of adult life, placing the disorder among the most impairing in psychiatry. Adults with ADHD, when compared with control groups, have significantly more and greater difficulties in academic and workplace settings, greater relationship discord, worse driving performance, higher rates of health care utilization, and numerous other difficulties associated with managing the affairs of adult life, such as parenting issues, money management, and organization (Barkley, 2006; Barkley, Murphy, & Fischer, 2008; Biederman et al., 2006, 2008).

There are also psychological effects of living with adult ADHD. Most individuals diagnosed with ADHD present with at least one other psychiatric diagnosis (Barkley, 2006; Barkley et al.,

2008). The most common comorbidities are depression, anxiety, and/or substance use problems. Controlled research of adults with ADHD has indicated that they report developmental experiences that are self-rated more negatively, that continue to have a negative influence on their lives, and that result in greater pessimism in adult life (Biederman et al., 2006).

The chronic and wide-ranging negative effects of adult ADHD often require comprehensive treatment approaches. Pharmacotherapy stands out as the single best treatment option available for ADHD. Despite the documented benefits of various medications for adult ADHD (Connor, 2006; Dodson, 2005; Prince, Wilens, Spencer, & Biederman, 2006), it is estimated that medications alone represent insufficient treatment for about half of adults with ADHD (Wilens, Spencer, & Biederman, 2000). Although medications may provide desired symptom improvements, these gains may not necessarily result in normalization or adequate improvements in domains of daily functioning. Hence, there is an increasing demand for adjunctive treatments for adult ADHD.

Among the more promising adjunctive treatments for adult ADHD are the psychosocial treatments, namely models of psychotherapy adapted to meet the needs of adult patients with ADHD (Ramsay, 2010). More specifically, the extant clinical outcome literature on the efficacy of psychosocial treatments for adult ADHD have been comprised primarily of cognitive-behavioral therapy (CBT) approaches.

Whereas medications target specific symptoms of adult ADHD, psychosocial treatments target functional impairments, helping patients to develop and implement effective coping strategies in their daily lives. Individual CBT-oriented approaches vary regarding whether treatment follows a modular approach in which specific coping skill domains are addressed (Safren et al., 2005; Weiss, Hechtman, & the Adult ADHD Research Group, 2006) versus case conceptualization oriented approaches that involve personalized treatment plans (Rostain & Ramsay, 2006; Wilens et al., 1999). Various modular group CBT approaches for adult ADHD also have been developed and studied over the past several years, ranging in length from 4 to 13 sessions (Bramham et al., 2009; Hesslinger et al., 2002; Philipsen et al., 2007; Solanto, Marks, Mitchell, Wasserstein, & Kofman, 2008; Stevenson, Whitmont, Bornholt, Livesey, & Stevenson, 2002; Virta et al., 2008; Wiggins, Singh, Getz, & Hutchins, 1999). Common themes of group CBT sessions include organization, time management, procrastination, relationships, and self-esteem. Published outcome studies of the aforementioned CBT approaches have indicated that completion of treatment is associated with improvements on measures of ADHD symptoms, measures of coexisting mood and anxiety symptoms, as well as ratings of overall functioning and improvement.

There are many limitations to the studies of CBT for adult ADHD that have been reviewed elsewhere (see Ramsay, 2010). These limitations notwithstanding, the positive results obtained in the outcome studies of various CBT approaches adapted to the needs of adults with ADHD are encouraging. Moreover, it may be useful to consider the potential mechanisms of change involved in CBT for adult ADHD in order to move toward developing psychosocial treatment guidelines for adult ADHD.

The reason CBT had to be adapted to the needs of adults with ADHD in the first place is that the disorder involves symptoms that may impede the effectiveness of standard CBT. In order to set the context for the discussion of adaptations of CBT for adult ADHD and hypothesized mechanisms of change, the next section will introduce the prevailing model of the core dysfunction underlying ADHD that helps explain its symptoms and impairments.

EXECUTIVE DYSFUNCTION MODEL OF ADHD

ADHD is generally understood as a disorder of impaired executive functions that result in downstream self-regulation problems. Executive functions, while tricky to characterize, are considered to be higher-order cognitive processes and abilities that coordinate and choreograph myriad

subordinate skills and processes toward goal-oriented outcomes (Barkley, 1997; Brown, 2005). More specifically, executive functions can be defined as “those self-directed actions of the individual that are being used to self-regulate” (Barkley, 1997, p. 56). These actions help identify, sort, and manage various stimuli that affect cognitive, affective, and behavioral functioning, with obvious consequences for managing daily life. Consequently, metaphors such as conductor, organizer, director, manager, and CEO have been used to illustrate the role of the executive functions in organizing behavior.

In Barkley’s (1997, 2008) model of ADHD, behavioral inhibition is the foundational executive function necessary for self-control. *Behavioral inhibition* involves the ability to inhibit a response to an immediately available reinforcer (either positive or negative), the capacity to interrupt and disengage from an ongoing behavior, and to resist interference from competing distractions. In effect, behavioral inhibition allows individuals to pause or delay their responses to the environment in order to assess, plan, and execute goal-oriented actions that affect future outcomes, otherwise known as the capacity for self-regulation; hence, behavioral disinhibition is thought to undergird the symptoms of ADHD.

The capacity to inhibit responses allows for the utilization of other executive functions that emerge in a stepwise manner in the course of development, with the performance of each successive executive skill building upon the previously laid foundation of skills. Consequently, it is understandable that some individuals with ADHD may experience progressively greater difficulties in adolescence and young adulthood as a result of the cumulative effects of executive dysfunction combined with the increasing demands of adolescence and adult life.

Each executive function develops by overt behavior becoming self-directed and eventually becoming privatized and fully cognitive (i.e., covert). *Nonverbal working memory* develops as the ability to hold and replay events in one’s mind. This ability allows individuals to reflect on environmental variables, contingencies, and outcomes and to eventually use this information to analyze past experiences (i.e., hindsight) and predict possible futures (i.e., foresight). Sense of time and organizing behavior across time are also associated with nonverbal working memory. *Verbal working memory* is associated with the development of privatized speech or self-talk. This executive function starts as outward use of speech to describe events, evolves into the use of speech turned inward to guide behavior, eventually becoming a fully covert capacity for following rule-governed behavior, implementation of metarules, and reading comprehension. *Affect regulation* comes next, starting with the experience of different emotional states. The child then becomes better able to manage and modify these feelings, ultimately being able to create and change emotional states and to use them to guide goal-directed behaviors in the absence of immediate contingencies (i.e., intrinsic motivation). Finally, *reconstitution* refers to the ability to analyze and synthesize behavior, which are skills necessary for creativity, problem solving, and planning. This skill emerges as externalized play, which involves the manipulation of the environment, thereby exploring different roles as well as how things work. The end result is the ability to quickly and efficiently develop plans for how to manage life situations in one’s mind. (See Barkley, 1997, 2008, for extended reviews of his theory of executive functions.)

Adaptive executive functioning allows individuals to organize and execute goal-directed actions across time. Information from personal experiences, vicarious learning, and the ability to conjure up novel plans from diverse sources of information helps to inform and guide learning and behavior. Moreover, individuals also employ these skills to persist in the pursuit of goals, to be resilient in the wake of setbacks or disruptions, and to integrate feedback gathered during the process in order to modify a course of action. In effect, executive functions allow the brain to operate as a “virtual reality machine” that allows individuals to develop options for managing their environments and then selecting and acting on one.

ADHD, on the other hand, is a disorder of impaired executive functioning. Dysfunction in any single executive skill can punctuate the development and implementation of behavioral plans

in daily life, creating functional impairments. Of course, individuals without ADHD may experience periodic executive function inefficiencies, resulting from interference from a medical or psychiatric disorder (e.g., depression), situation- or role-specific difficulties (e.g., dealing with family issues), facing novel situations (e.g., trial-and-error learning), or simply from normal variations in functioning (e.g., fatigue, stress). However, ADHD is characterized by persistent and pervasive symptoms that directly result in impairment; thus, whereas individuals without ADHD are able to resume generally effective executive functioning, adults with ADHD experience persistent functional difficulties, as would be expected from a developmental syndrome. ADHD interferes with the ability to modify behaviors and to use problem-solving strategies despite the recognition of the need to do so. Consequently, many adults with ADHD report that they realize what needs to be done to improve their functioning, but have difficulty following through, thus making ADHD an “implementation disorder.”

Medications improve functioning of the areas of the brain involved in executive systems, from which the executive functions emanate. However, even with symptom improvement, many adults with ADHD continue to struggle with the secondary effects of executive dysfunction in addition to issues related to using coping strategies, managing coexisting problems, and overcoming pessimistic thoughts and expectations of failure resulting from past setbacks. These secondary effects of ADHD reflect the ongoing, corrosive effects of the disorder.

As was discussed earlier, CBT-oriented approaches for adult ADHD have produced positive clinical results in numerous outcome studies. However, it is clear that ADHD is not the direct result of distorted cognitions. What is more, CBT is delivered in clinic-based settings and not at the “point of performance,” so why has CBT been found to be helpful for adults with ADHD when it would seem that the nature of the disorder would interfere with any sort of psychotherapy? The next section reviews how CBT has been adapted for adult ADHD.

CBT MODEL ADAPTED FOR ADULT ADHD

ADHD is not caused by maladaptive cognitions. In fact, many features of ADHD result from the absence of a triggering thought, such as impulsivity (i.e., acting without thinking) or distractibility (i.e., attending to competing environmental stimuli). However, living with a developmental disorder characterized by impaired executive functions affects an individual’s experience in most life settings, particularly those from which one’s sense of self are constructed, such as school, work, and relationships. In addition to the chronic functional difficulties associated with ADHD, recurring frustrations in these life domains can lead to the development of pessimistic outlooks, negative assumptions about one’s abilities, and dysfunctional belief systems. These negative outlooks can be insidious for adults with ADHD because they tend to be overgeneralized and engender self-defeating thoughts and behaviors. These maladaptive thoughts and behaviors (and distressing emotions), in turn, interfere with the implementation of effective coping strategies, diminish one’s perceived ability to take proactive steps to change circumstances, and erode the sense of resilience necessary to manage ADHD.

These core beliefs, or *schemas*, result from the human tendency to assess, categorize, and try to make sense of environmental information and personal experience. The categories of schema that have been described represent common domains of human experience, such as autonomy and connectedness (Young, 1999). The capacity to store information in this manner represents an adaptive cognitive framework, though particular beliefs can be maladaptive if distorted and inflexible, thereby creating misperceptions of events and seemingly self-defeating behaviors. Schemas are thought to exert influence on behavior from as early as 8 years of age (Taylor & Ingram, 1999), though they do not necessarily consolidate until the adolescent years (Hammen & Zupan, 1984). Interestingly, these findings are consistent with the developmental model of the executive functions (Barkley, 1997), particularly the privatization of verbal working memory (i.e.,

self-directed speech, Vygotsky, 1978)—That is, around the age when schema influence behavior is when self-talk becomes increasingly covert and guides behavior.

The executive function that follows verbal working memory is affective self-regulation or the ability to intentionally modify emotional states. The development of schemas is thought to be tied with developmental experiences, which are particularly influenced by emotions associated with these experiences. Hence, the capacity to modify an existing emotional state based on the demands of the immediate environment (e.g., managing frustrations at school) or to generate an emotional state regarding a future-oriented task (e.g., motivation to start organizing a report for work) is an important component in the treatment of adult ADHD as well as in CBT.

With ADHD being a developmental disorder, the executive functions of verbal working memory and emotional regulation develop later and less efficiently in individuals with ADHD. Therefore, patients with ADHD may have had greater difficulties managing their behaviors and their emotions relative to their same-age peers throughout their lives. Although children with ADHD often exhibit a positive illusory bias (Owens, Goldfine, Evangelista, Hoza, & Kaiser, 2007), they may face a rude awakening as they come to recognize the effects of their coping difficulties in later childhood and adolescence. Consequently, their schemas may develop later (due to executive dysfunction) and are more likely to be influenced by distressing emotions associated with functional difficulties; in turn, individuals with ADHD may develop maladaptive beliefs that are prone to be activated by standard life demands (e.g., school, work) and may be more difficult to change, particularly when maintained by patterns of procrastination and avoidance. In fact, developmental delays in verbal working memory and affect regulation may explain why CBT has not been found to be effective in the treatment of children and younger adolescents with ADHD (Antshel & Barkley, 2008).

The CBT conceptualization is modified to account for the executive dysfunction and developmental experiences of these patients (Ramsay & Rostain, 2008). Individuals who were diagnosed in childhood and grew up with an awareness of their ADHD may have lingering expectations of “failure” and “self-mistrust” that can be reactivated when encountering problems in adult roles. Individuals who experienced mild, undiagnosed difficulties in childhood may have had simmering doubts about their abilities, such as feeling like an “imposter” or being a “fraud,” that become activated when facing difficulties in adulthood. Even if these cognitions are mild, they can be easily triggered and magnified by the effects of executive dysfunction.

In terms of adapting CBT for adult ADHD, there are important modifications of typical interventions based on an understanding of executive dysfunction. Treatment is provided in the consulting room and not at the “point of performance.” However, it is important to make CBT “sticky” so that patients are more likely to remember and implement coping strategies in the appropriate context. Keeping in mind the aforementioned model of executive dysfunction and ADHD, the next section reviews some of the adaptations to typical CBT that serve as potential mechanisms of change in the treatment of adults with ADHD.

HYPOTHESIZED MECHANISMS OF CHANGE IN CBT FOR ADULT ADHD

Mechanisms of change refer to the various intervention approaches—the “active ingredients”—that most likely promote functional improvements for patients with ADHD. Although it is easier to isolate the mechanisms of action for medications, it is useful to speculate about the components of CBT for adult ADHD that are associated with the positive outcomes achieved in the existing clinical outcome studies.

One aspect of CBT that can be helpful for adults with ADHD is the use of sessions as a form of prolongation. *Prolongation* refers to a cognitive capacity associated with the executive functions. It is the delay in and reflection on experience that allows individuals to analyze a situation,

consider options, plan a course of action, and then implement the plan (or defer implementation). Individuals with ADHD are likely to put off dealing with an issue that is not imminent, minimize its importance, or make a rash decision on how to handle a situation without fully considering options in order to avoid facing a stressful topic. The agenda setting in CBT sessions reserves sufficient time to focus on individual problems or coping topics, to go through the steps of problem management, and to anticipate potential barriers to follow through.

While problem management and coping plans are a central focus of CBT for adult ADHD, individualized *psychoeducation* provides an important mental framework for adults with ADHD. In fact, an accurate assessment of ADHD for an adult may be the first cognitive intervention insofar as the diagnosis provides a reframe of problems that had likely been deemed the result of either characterological flaws or hopelessly entrenched self-defeating behaviors.

One of the results of executive dysfunction is that individuals with ADHD have a harder time setting up systems and routines in their lives. Again, it is not lack of knowledge about what needs to be done, but difficulties implementing these plans. Psychoeducation provides rudimentary mental *scaffolding* from which individuals come to understand and recognize the effects of ADHD on their lives. Subsequent interventions build upon and expand this scaffolding, serving as a prosthetic for executive functions insofar as this personalized education and coping strategies provide tools for individuals with which to more effectively manage their lives. An important component of psychoeducation is the discussion of issues related to environmental engineering and executive function training.

Environmental engineering refers to the process of setting up one's living, work, and study settings to make them more ADHD-friendly in terms of instituting systems designed to circumvent the effects of executive dysfunction. Reducing distractions in work or study areas, setting up automatic payment plans, obtaining and using a daily planner, and so on represent many basic yet vital steps necessary to manage the effects of ADHD. The specific adjustments are made on a case-by-case basis in terms of what is most likely to be effective and sustainable, such as the choice between an electronic organizer and article appointment book. These specific coping strategies represent elements of *executive function training*. That is, the requisite time management and organizational skills are reviewed and practiced in terms of finding and using strategies patients with ADHD can use to manage what individuals without ADHD can do with less effort. The "training" is in the consistent use and routinization of these coping strategies that compensate for executive dysfunction and result in improved day-to-day functioning.

As was mentioned earlier, most of the coping strategies and environmental engineering suggestions developed in the course of CBT for adult ADHD will not be new to these patients. The benefit of CBT is not in the coping suggestions but in their implementation. The *implementation strategies* regarding the use of coping skills and follow through on other behavioral goals involves the combination of cognitive and behavioral modification strategies targeting the secondary effects of executive dysfunction in adult ADHD. The implementation focus is different than a goal focus. A goal focus assumes that individuals can hold in mind a desired superordinate outcome that drives subordinate behaviors that will achieve the outcome. Thus, the goal of completing a report for work will provide a framework for the requisite component tasks (e.g., gather and review information, organize report, write report, and submit by the deadline).

Of course, individuals with ADHD have difficulty following through on such goals without immediate consequences. Thus, an implementation focus has been found to be helpful for individuals with ADHD as well as in other clinical situations focused on behavior change (Gawrilow & Gollwitzer, 2008). Rather than an overarching goal, an implementation focus involves the identification and isolation of crucial decision-making points in targeted behaviors, such as getting started on the first step of gathering the necessary information for the aforementioned report. Prolongation is used to emphasize the importance of the situation (i.e., affective salience), construct a prospective plan, and review the patient's motivation to employ the plan, as well as to

identify possible ambivalence. Potential barriers to implementation, such as maladaptive thoughts (e.g., “I can wait. I have plenty of time”), emotions (e.g., feelings of aversion toward the task), and avoidant behaviors (e.g., responding to emails) are anticipated, as are ways to manage them to increase the likelihood of follow through.

As was indicated above, *cognitive modification* plays an important role in treatment for adult ADHD. Common task-interfering thoughts involve some sort of magnified negative view of the task or inability to complete the task, perhaps based in part on past problematic experiences (e.g., “My reports are no good” or “This is going to be awful”) or, conversely, a minimization of the task (e.g., “I have plenty of time, I can do it later”). The development of credible alternative possibilities, enhancing motivation for follow through, and reviewing a plan for implementation are important aspects of cognitive modification. These cognitive approaches are paired with *behavioral modification* strategies, most often behavioral activation, focused on identifying the smallest increment, either time-based (e.g., “Can you commit to working on it for at least 5 min?”) or task-based (“Can you commit to compiling data for at the first section of the annual report?”), to help make a coping plan more specific and more manageable, thereby increasing the likelihood of follow through. The combination of these implementation strategies hopefully results in patients’ *exposure* to previously avoided tasks, thereby gathering experiential data to counter negative thoughts and to promote a sense of competence and resilience.

CBT is also an effective approach for addressing the *comorbid difficulties* most commonly reported by adults with ADHD. Although not necessarily directly resulting from ADHD, identifying and treating comorbid depression and anxiety seen in cases of adult ADHD are important aspects of treatment as these may be the problems that led a patient to enter treatment for ADHD; furthermore, relieving coexisting distress may make it easier for an individual with ADHD to focus on implementing coping skills.

The challenge remains that patients with ADHD leave the consulting room to fend for themselves regarding the use of coping strategies. The aforementioned interventions are designed to increase the likelihood that individuals with ADHD will utilize their coping strategies in a timely, efficient manner at the *point of performance*. To this end, the use of externalized reminders (e.g., coping cards, alarm), interpersonal reminders (e.g., support person provides encouragement), tangible representations of a task (e.g., pulling a to-do chore out of a task box), and between-sessions contact (e.g., scheduled e-mail reminders) help increase follow through. CBT sessions address potential barriers to follow through and increase task salience through the use of motivation enhancement and evocative metaphors that increase the likelihood that coping strategies discussed will be activated when needed.

Finally, an underappreciated aspect of CBT, particularly in the treatment of adult ADHD, is the development of *constructive interactions*, with the therapeutic relationship being a prime example. Many of the frustrations experienced by individuals with ADHD happen publicly—poor work performance evaluation, forgetting a promise made to a friend, and so on. CBT represents another situation in which patients with ADHD may expect to fail. Patients may assume that their therapists are bored with repeatedly reviewing the same issues or with lack of follow through on therapeutic homework, putting them at increased risk of quitting therapy and thereby strengthening their negative beliefs. Thus, establishing a strong working alliance, using accurate empathy to understand and normalize patients’ frustrations, and then helping them reengage in the change process is a useful way to model resilience and to separate patients’ coping difficulties from their sense of self.

SUMMARY

ADHD is a developmental disorder that requires ongoing coping efforts to effectively manage. Medications provide a foundation of symptom relief for most individuals with ADHD. However, CBT adapted for adult ADHD has been shown to produce additional benefits in preliminary

research. In particular, CBT addresses areas of impairment in daily life and helps adults with ADHD to implement effective coping strategies and modify the thoughts and beliefs that could interfere with follow through on reasonable personal objectives. Consequently, CBT may be an important component of a multimodal treatment plan for adult ADHD to further promote improved daily functioning and well-being.

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