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Dysfunctional Cognitions and their Emotional, Behavioral, and Functional Correlates in Adults with Attention Deficit Hyperactivity Disorder (ADHD): Is the Cognitive-Behavioral Model Valid?

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Abstract

Objective: To investigate the presence of dysfunctional cognitions in adults with ADHD and to determine whether these cognitions are associated with emotional symptoms, maladaptive coping, and functional impairment, as predicted by the cognitive-behavioral model. **Method:** A total of 35 adult participants with ADHD, 20 nonclinical controls, and 20 non-ADHD clinical controls were assessed with measures of ADHD symptoms, dysfunctional cognitions, depression and anxiety symptoms, coping strategies, and quality of life. **Results:** ADHD group showed elevated scores of dysfunctional cognitions relative to nonclinical control group and comparable with clinical control group. Dysfunctional cognitions were strongly associated with emotional symptoms. ADHD group also showed elevated scores in maladaptive coping strategies of the escape-avoidance type. Life impairment was satisfactorily predicted in data analysis when ADHD symptoms, dysfunctional cognitions, and emotional symptoms were fitted into a regression model. **Conclusion:** Cognitive-behavioral therapy model appears to be a valid complementary model for understanding emotional and life impairment in adults with ADHD. *(J. of Att. Dis. 2012; XX(X) 1-XX)*

Keywords

ADHD, automatic thoughts, dysfunctional beliefs, coping, depression, anxiety

In parallel with the growing awareness of the persistence of ADHD into adulthood, various specific psychological treatments have been developed for this population in recent years (Knouse, Cooper-Vince, Sprich, & Safren, 2008; Weiss et al., 2008). Most of them are inspired by cognitive-behavioral therapy (CBT) and implemented as adjunctive interventions during pharmacological treatment (Safren, 2006). The proposed protocols combine psychoeducation to increase consciousness and understanding of the disorder, conventional CBT techniques to ameliorate emotional adjustment, and cognitive remediation methods to provide healthy compensatory strategies for deficient attention, executive functioning, and impulse control (Ramsay, 2010). In addition, as a theoretical model, the cognitive-behavioral approach provides a useful framework for understanding how negative life experiences may reinforce functional impairment and lead to increased emotional disturbances in adults with ADHD. Because of neurobiological deficits in attention, executive function, and inhibitory control, failure and underachievement in different domains of function are common occurrences in participants with ADHD as they enter adulthood (Barkley, Fischer, Smallish, & Fletcher, 2006; Biederman et al., 2006). According to the CBT model, such repeated life experiences of frustration undermine self-concept and self-esteem, leading to the formation of negative beliefs about the self, which, in turn, favors the expression of negative emotions such as depression and anxiety. Negative self-beliefs can also lead to the adoption of maladaptive behavioral strategies, which can include negation, procrastination, and extreme avoidance as means of coping with difficult tasks (Ramsay & Rostain, 2008; Safren, 2006; Young & Bramham, 2007). In addition to emotional disturbances, negative expectations about the

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future, anticipation of failure, and reduced self-confidence could also affect motivation (Ramsay, 2010; Ramsay & Rostain, 2008; Torrente et al., 2011).

Clinical research about CBT in adults with ADHD is early in its development, but results are encouraging. Several pilot studies suggested the feasibility and acceptability of the treatment protocols based in this model (Knouse et al., 2008). More recently, a series of randomized controlled studies showed the efficacy of CBT for adult patients with ADHD (Safren et al. 2005, 2010; Solanto et al., 2010; Stevenson, Whitmont, Bornholt, Livesey, & Stevenson, 2002). Beyond clinical testing, empirical research addressing the specific built-in assumptions of the CBT conceptualization is still fragmentary and overgeneral. Some studies have reported deficiencies in self-esteem in adolescents with ADHD (Slomkowski, Klein, & Mannuzza, 1995) and young adults (Hechtman, Weiss, & Perlman, 1980). In addition, some studies in college students with ADHD (Blase et al., 2009; Canu & Carlson, 2007; Gudjonsson, Sigurdsson, Eyjolfsdottir, Smari, & Young, 2009; Shaw-Zirt, Popali-Lehane, Chaplin, & Bergman, 2005) did find problems in self-esteem, academic and social concerns, and lower satisfaction with life, whereas another study did not (Wilmshurst, Peele, & Wilmshurst, 2011). However, to date, there is limited research exploring the specific type of constructs postulated by the CBT model. This lack of specific studies is an important issue because cognitive-behavioral theory assumes not only that participants with ADHD develop a negative self-image and concerns along time but also that this view of the self articulates in a belief system composed by different types of dysfunctional thoughts with definite formal characteristics and contents (A. T. Beck, 1964, 1976). In addition, even if the CBT model—and in particular the idea of negative self-beliefs in ADHD—seems plausible in terms of face validity, a consistent line of research in children with ADHD has shown that not always is a bad performance accompanied by a negative self-image because of the so-called "positive illusory bias" (Hoza, Pelham, Dobbs, Owens, & Pillow, 2002). Several studies have shown that children with ADHD have unrealistically high self-views of skills and competencies, despite histories marked with failure in numerous domains (Hoza et al., 2002; Owens, Goldfine, Evangelista, Hoza, & Kaiser, 2007). In addition, one study with college students with ADHD has suggested that the positive illusory bias may apply to young adults too (Canu & Carlson, 2007). Therefore, the nature and extent of negative beliefs in adults with ADHD is a matter of further empirical exploration. Equally, other components of the CBT model are understudied. Regarding maladaptive coping strategies, Young (2005) found that adult participants with ADHD used more confronting and escape-avoidance behaviors and less planful problem solving for managing stressful situations of their life. More constructively, participants with ADHD used "positive reappraisal" as an adaptive coping strategy intended to create a positive meaning of the stressful situations by focusing on personal growth or learning. Even if this study is relevant to the CBT model, their findings have not been replicated. Finally, no research article, into our knowledge, integrated the different components of CBT—cognitive, emotional, behavioral, and functional, together with their relationships—in a whole study within a clinical context. For these reasons, the general purpose of this study has been to explore the specific theoretical hypotheses assumed in the CBT approach as discrete assertions and as an integrated model in a clinical sample of adults with ADHD.

The first assumption of the CBT model to be tested involves the presence of dysfunctional cognitions in adults with ADHD and their association with secondary emotional symptoms. Resembling the application of the CBT model to other disorders (A. T. Beck, 1976; A. T. Beck, Rush, Shaw, & Emery, 1979), negative thoughts in ADHD are supposedly organized in a multilevel dysfunctional belief system that affects views of the self, the world, and the future (Ramsay & Rostain, 2008). Beck (A. T. 1964) utilized the concept of *schema* for describing the way in which this belief system works. A schema is a cognitive structure that helps individuals to categorize, evaluate, and respond efficiently to the variety of environmental stimuli. In psychopathological conditions, some schemas characterized by dysfunctional beliefs become prepotent and distort the way the situations are perceived and interpreted. *Core beliefs* constitute the more stable and global type of cognitions in this system. In adults with ADHD, core beliefs comprehend characteristic themes of self-mistrust, failure, incompetence, inadequacy, and instability (Ramsay & Rostain, 2008). Schemas also comprise *dysfunctional attitudes* that could be defined as a set of rules and assumptions that guide the interpretation of different scenarios and the resulting behavioral approach (J. Beck, 2011; A. T. Beck et al., 1979). Finally, a third class of dysfunctional cognitions—the *automatic thoughts*—is triggered when the schemas are activated by a life event. Automatic thoughts are short and rapid situation-specific cognitions that condense in a phrase or an image the meaning attributed to the situation as a result of the schematic processing. Dysfunctional attitudes and automatic thoughts are tightly tied to the expression of negative emotions, such as depression and anxiety, and with the adoption of maladaptive compensatory strategies (A. T. Beck, 1976; A. T. Beck et al., 1979). As we noted earlier, this is an important feature of the CBT model of ADHD because it concerns the specific role attributed to maladaptive cognitions in this disorder. The dysfunctional belief system does not contribute to the etiology of primary neurocognitive symptoms of ADHD; in contrast, the secondary comorbid symptoms and emotional maladjustment are the consequences of it. Of course, other existing psychological or biological factors may provoke comorbid manifestations, but

they do not invalidate the strong postulated relationship between dysfunctional cognitions and emotional symptoms in ADHD. Indeed, dysfunctional cognitions may result from a variety of biological and psychosocial influences that converge in a vulnerability ground for developing depressive or anxious manifestations (A. T. Beck, 2008). Despite the importance attributed to them in the model, the existence of dysfunctional beliefs in adults with ADHD has not been exhaustively assessed and reported with specific measures. Likewise, there has not been enough research into the relationship between this type of negative cognitions and emotional perturbations in the clinical population. Hence, the first aim of this study was to investigate the presence of manifest dysfunctional cognitions in adults with ADHD and to determine whether these cognitions are truly associated with comorbid depressive and anxiety symptoms. For this purpose, two widely used measures of dysfunctional cognitions, the Automatic Thoughts Questionnaire (ATQ; Hollon & Kendall, 1980) and the Dysfunctional Attitude Scale (DAS; Weissman & Beck, 1978), have been used. Prior studies utilizing these general measures of dysfunctional beliefs have found that measurements of negative cognitions are commonly associated with depression and anxiety symptoms in different disorders (R. Beck & Perkins, 2001; Kuiper, Olinger, & Martin, 1988; Weich, Churchill, & Lewis, 2003).

The second assumption of the CBT model of adults with ADHD to be explored in this study concerns the relationship between dysfunctional cognitions and maladaptive compensatory strategies. Like emotional symptoms, dysfunctional compensatory behaviors are not considered by the CBT model as core symptoms of ADHD, but instead as secondary acquisitions that are adopted in response to task difficulties. Avoidance behaviors, such as procrastinating, continuous shifting of tasks, or focusing on low-priority tasks, are the more common dysfunctional strategies reported in clinical accounts of adults with ADHD (Ramsay & Rostain, 2008; Young & Bramham, 2007). In addition, confronting coping, less planful problem solving, and positive reappraisal have been found in the aforementioned study by Young (2005). Thus, the second aim of this study was to explore the coping behaviors of adults with ADHD and the relationship between those strategies and dysfunctional cognitions and emotional symptoms. For this purpose, the Ways of Coping Scale (WOCS; Folkman & Lazarus, 1985), an instrument for assessing specific coping behaviors, has been applied to evaluate strategies used by ADHD participants in response to problematic situations. The WOCS has been employed in the previous study of coping behaviors in adults with ADHD by Young (2005); therefore, it has been possible to make direct comparisons between studies.

Finally, the CBT model of ADHD assumes that life outcomes and functional impairment in adulthood are products of primary neurocognitive deficits and aggregated disturbances. Negative cognitions, emotional symptoms, and maladaptive behaviors reinforce negative outcomes in daily performance, resulting in a generally impoverished quality of life. The Adult ADHD Quality of Life Scale (AAQoL; Brod, Johnston, Able, & Swindle, 2006), a disorder-specific instrument for measuring the quality of life of adult patients with ADHD, has been utilized as a proxy for assessing the impact of CBT variables on everyday functioning. AAQoL integrates different dimensions of functioning that provide information about the specific impairments and consequences of ADHD that negatively affect quality of life, such as life productivity, psychological health, interpersonal relationships, and general life outlook.

Thus, in accordance with the previously described aims, the hypotheses of this study were as follows:

Hypothesis 1: Adult patients with ADHD would show elevated scores in measures of dysfunctional cognitions relative to nonclinical control participants and comparable with other clinical control participants.

Hypothesis 2: Scores of dysfunctional cognitions would be positively correlated with measures of depression or anxiety symptoms.

Hypothesis 3: Maladaptive coping strategies scores would be elevated in participants with ADHD in comparison with control participants, and the scores would correlate positively with dysfunctional cognition scales and/or emotional symptoms scores.

Hypothesis 4: Poorer quality of life would be predicted by scores of primary ADHD symptoms and measures of dysfunctional cognitions, emotional symptoms, and maladaptive coping.

Method

Participants

ADHD patients. Participants were recruited from the Clinic for Adults with ADHD at the Institute of Cognitive Neurology (INECO, Buenos Aires, Argentina). A total of 35 patients fulfilled the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM-IV*) criteria for ADHD (American Psychiatric Association [APA], 1994). This group included 29 patients with ADHD combined type and 6 with ADHD predominantly inattentive type. ADHD diagnosis based on the *DSM-IV* criteria was made by two experts (AL and FT) following the assessment protocol for adults as suggested by Murphy and Gordon (2006) and used in previous studies within the same population (Torralva et al., 2011; Torrente et al., 2011). The protocol comprises the following:

a. Patient and informant versions of the ADHD Rating Scale for Adults (Barkley & Murphy, 1998), which itemize current symptoms and retrospective

childhood symptoms corresponding to *DSM-IV* characterization of ADHD (see "Materials and Procedures" for further description).
b. A comprehensive clinician-guided interview to the patient based on Barkley and Murphy (1998) that surveys past and present ADHD symptoms, adaptive functioning, social adjustment, developmental and medical history, school and work history, psychiatric history and prior treatments, and family history of ADHD, or any psychiatric or medical condition.
c. An interview with relatives or significant others (usually parent or spouse), during which they complete the informant-based versions of questionnaires and supplement background data.
d. Neuropsychological assessment involving a wide array of tests measuring attention, memory, executive functioning, language, and general intellectual abilities (for details, see Torrente et al., 2011).

Patients were included in the study only if there was an agreement about diagnosis between two independent raters after examination of the complete assessment protocol. All patients were examined to rule out any potentially confounding comorbid psychiatric or neurological condition, including, but not limited to, traumatic brain injury, schizophrenia, bipolar disorder, or borderline personality disorder. Patients with depressive or anxious syndromes were not excluded from the study because we wanted to preserve a clinically naturalistic sample and because CBT does not assume that depressive and anxious symptoms are etiologically derived from ADHD but that life negative experiences and comorbidities contribute to generate them, as we discussed before. Moreover, CBT treatment rationale explicitly intends to ameliorate comorbidities associated with emotional perturbations in adults with ADHD (Safren, 2006), rather than exclude them.

Clinical control participants. This sample consisted of 20 participants without ADHD who were initiating psychotherapy treatment at INECO for different disorders, which included depression or anxiety symptoms (4 patients with major depression, 1 with dysthymic disorder, 4 with obsessive-compulsive disorder, 2 with generalized anxiety disorder, 2 with panic disorder with agoraphobia, 1 with panic disorder without agoraphobia, 5 with anxiety disorder not otherwise specified, and 1with an adjustment disorder). Inclusion criteria for this group excluded patients with current or past ADHD, personality disorder, bipolar disorder, or schizophrenia. Diagnosis was established with the Structured Clinical Interview for *DSM-IV* Axis I Disorders (First, Spitzer, Gibbon, & Williams, 1998). Patients also completed the ADHD Rating Scale for Adults (Barkley & Murphy, 1998) to confirm that they did not fulfill current criteria for ADHD.

Nonclinical control participants. Nonclinical controls (n = 20) were volunteers who were screened to exclude participants with current or previous psychiatric disorders. All participants gave informed consent prior to inclusion in the study. The study was approved by the ethics committee at the INECO.

Materials and Procedures

Questionnaires

Automatic Thoughts Questionnaire-30 (ATQ-30). The 30-item ATQ-30 (Hollon & Kendall, 1980) measures the frequency of occurrence of automatic negative thoughts (negative self-statements) associated with depression. Respondents rated the frequency of occurrence of negative thoughts on a 5-point Likert-type scale ranging from *not at all* to *all the time*. In the whole sample of participants included in the present study, the Spanish version of ATQ-30 showed an excellent internal consistency (α = .96), and correlations with measures of depression (Beck Depression Inventory-II [BDI-II]; r = .82) and anxiety (State-Trait Anxiety Inventory [STAI-R]; r = .81) were high and congruent with the construct.

DAS. This is a 40-item self-report questionnaire (Weissman & Beck, 1978) designed to assess maladaptive cognitions commonly associated with depression, including concern with evaluation, perfectionist standards of performance, causal attributions, and rigid ideas about the world. Higher scores of the DAS reflect greater dysfunctional attitudes. In our whole sample, internal consistency of the Spanish version of the DAS was high (α = .92). Correlations with measures of depression (BDI-II; r = .49) and anxiety (STAI-R; r = .66) were moderate but congruent with the construct.

WOCS (Revised). This is a 66-item questionnaire (Folkman & Lazarus, 1985) containing a wide range of thoughts and actions that people use to deal with the internal and/or external demands of specific stressful situations. The WOCS is made up by eight subscales: Confronting Coping (WOCS-CC), Distancing (WOCS-D), Self-Controlling (WOCS-SC), Seeking Social Support (WOCS-SSS), Accepting Responsibility (WOCS-AR), Escape-Avoidance (WOCS-EA), Planful Problem Solving (WOCS-PPS), and Positive Reappraisal (WOCS-PR). Internal consistency of the Spanish version of the WOCS in our sample was adequate for total scale (α = .88) as it was also for six of the eight subscales (α range from .61 to .84). Two subscales presented poor internal consistency values (α = .32 for WOCS-SC, and α = .51 for WOCS-CC).

ADHD Rating Scale for Adults. This is a self-report questionnaire (Barkley & Murphy, 1998) that contains 18 items based on the diagnostic criteria for ADHD in the *DSM-IV*. Respondents rated the intensity of ADHD symptoms on a 4-point Likert-type scale ranging from 0 = *never or rarely* to 3 = *very often*. Participants completed two versions of this scale, one targeting current symptoms and the other

Table 1. Mean Scores and Between-Groups Comparisons of the CBT Model Variables

	ADHD (*N* = 35)		Clinical controls (*n* = 20)		Nonclinical controls (*n* = 20)		ANOVA		Post hoc comparisons		
	M	*SD*	*M*	*SD*	*M*	*SD*	*F*	*p*	ADHD vs. HC	ADHD vs. CC	CC vs. HC
ADHD symptoms											
ADHD-RS-T	27.37	6.73	13.47	7.48	6.45	5.95	67.52	<.001	<.001	<.001	.006
ADHD-RS-I	15.29	4.36	6.59	3.68	2.70	2.56	78.14	<.001	<.001	<.001	.007
ADHD-RS-HI	12.09	4.47	6.88	4.70	3.75	3.95	24.56	<.001	<.001	<.001	*ns*
Emotional symptoms											
BDI-II	17.53	10.00	16.95	10.87	5.00	4.30	13.35	<.001	<.001	*ns*	<.001
STAI-T	32.88	9.94	31.70	9.96	13.90	6.26	30.16	<.001	<.001	*ns*	<.001
Dysfunctional cognitions											
ATQ-30	70.63	21.39	61.45	23.01	37.70	5.89	19.07	<.001	<.001	*ns*	.001
DAS	138.26	33.12	141.75	38.98	94.90	18.93	14.49	<.001	<.001	*ns*	<.001
Coping behaviors											
WOCS—Confronting coping	6.94	3.55	7.11	3.43	7.42	2.93	0.12	.884	*ns*	*ns*	*ns*
WOCS—Distancing	5.75	2.62	5.42	4.22	4.63	2.89	0.74	.483	*ns*	*ns*	*ns*
WOCS—Self-controlling	7.84	3.62	8.00	2.79	8.32	3.84	0.11	.896	*ns*	*ns*	*ns*
WOCS—Seeking social support	9.38	4.21	9.47	3.96	10.11	4.67	0.19	.831	*ns*	*ns*	*ns*
WOCS—Accepting responsibility	5.91	3.25	5.42	2.89	4.95	2.86	0.60	.552	*ns*	*ns*	*ns*
WOCS—Escape-avoidance	7.47	4.36	8.26	4.24	4.16	3.20	5.73	.005	.017	*ns*	.007
WOCS—Planful problem solving	6.87	3.41	5.26	2.33	8.21	2.90	4.55	.014	*ns*	*ns*	.010
WOCS—Positive reappraisal	7.94	5.10	6.79	3.36	10.63	5.52	3.24	.046	*ns*	*ns*	.044
Quality of life											
AAQoL	47.84	16.34	—	—	—	—	—	—	—	—	—

Note: ADHD-RS-T = ADHD Rating Scale–Total Score; ADHD-RS-I = ADHD Rating Scale–Inattention Score; ADHD-RS-HI = ADHD Rating Scale–Hyperactivity/Impulsivity Score; BDI-II = Beck Depression Inventory-II; STAI-T = State-Trait Anxiety Inventory–Trait subscale; ATQ-30 = Automatic Thoughts Questionnaire-30; DAS = Dysfunctional Attitudes Scale; WOCS = Ways of Coping Scale; AAQoL = Adult ADHD Quality of Life Scale.

assessing childhood symptoms between ages 5 and 12 years. Only ratings of current symptoms were taken into account for this study. For each participant, the scale provides three different scores: the sum of ADHD item ratings on the total scale (ADHD-RS-T), the sum of inattention items (ADHD-RS-I), and the sum of hyperactive-impulsive items (ADHD-RS-HI). In a previous study within the same population (Torrente et al., 2011), the ADHD-RS showed a good internal consistency for the total scale (α = .88), for the inattention subscale (α = .80), and for the hyperactivity/impulsivity subscale (α = .72). In addition, the pattern of results obtained with this instrument was mostly congruent with the expected differences between subgroups in the present study (see Table 1).

BDI-II. This is a widely used 21-item self-report instrument (A. T. Beck, Steer, & Brown, 1996) developed to measure the severity of depression symptoms. The BDI-II has been successfully adapted to the local population of this study (Brenlla & Rodriguez, 2006) showing satisfactory psychometric properties (α = .88 for the clinical sample and .86 for the normative sample; *r* = .86 for test–retest reliability; adequate concurrent validity with other depression measures and good diagnostic discriminatory power between clinical and nonclinical population).

STAI–Trait subscale. The STAI (Spielberger, Gorsuch, & Lushene, 1970) is a widely used measure of transient and more enduring symptoms of anxiety. The first 20 items assess state anxiety (STAI-S), or how the participant feels right now; the second 20 items assess trait anxiety (STAI-T), or how the participant generally feels. Only the STAI-T was employed in this study. Previously adapted to the local population (Leibovich de Figueroa, 1991), the STAI-T has shown a high internal consistency (α = .90) and test–retest reliability (*r* = .93).

AAQoL. This is a specific self-report instrument (Brod et al., 2006) designed to assess quality of life during the previous 2 weeks in adults with ADHD. Because it is a specific measure for this population, only participants with ADHD completed this scale. Each item is rated by patients on a 5-point Likert-type scale (ranging from *not at all/never* to *extremely/very often*). The scale yields a total score and four subscale scores: Life Productivity, Psychological

Table 2. Correlations for CBT Variables in the ADHD Sample (N = 35)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. ADHD-RS-T	—													
2. ATQ-30	.35*	—												
3. DAS	.11	.32	—											
4. BDI-II	.50**	.75**	.12	—										
5. STAI-R	.41*	.79**	.54**	.70**	—									
6. WOCS—Confronting coping	−.07	−.14	−.05	−.17	−.03	—								
7. WOCS—Distancing	.29	.41*	−.01	.28	.10	−.39*	—							
8. WOCS—Self-controlling	.36*	.38*	−.28	.27	.16	.15	.23	—						
9. WOCS—Seeking social support	.05	.03	−.16	−.01	.09	.61**	−.21	.17	—					
10. WOCS—Accepting responsibility	.37*	.30	−.10	.35	.19	.34	.24	.23	.56**	—				
11. WOCS—Escape-avoidance	.34	.31	.05	.32	.15	−.04	.40*	.16	.20	.41*	—			
12. WOCS—Planful problem solving	.04	−.12	.09	−.09	.06	.56**	−.22	.22	.34	.29	−.17	—		
13. WOCS—Positive reappraisal	.21	.00	−.09	−.11	−.02	.62**	−.33	.42*	.62**	.41*	.26	.41*	—	
14. AAQoL	−.64**	−.55**	−.31	−.66**	−.67**	.31	−.27	−.27	.12	−.04	−.30	.13	.08	—

Note: ADHD-RS-T = ADHD Rating Scale–Total Score; ATQ-30 = Automatic Thoughts Questionnaire-30; DAS = Dysfunctional Attitudes Scale; BDI-II = Beck Depression Inventory-II; STAI-T = State-Trait Anxiety Inventory–Trait subscale; WOCS = Ways of Coping Scale; AAQoL = Adult ADHD Quality of Life Scale.
*p < .05. **p < .01.

Health, Life Outlook, and Relationships. As it is a self-report instrument, the AAQoL could not be considered an objective measure of functional outcome, but instead a subjective proxy of it. In this study, the total score was used as an index of global everyday outcome, with a lower score reflecting poorer quality of life. Internal consistency for the total scale in the ADHD sample of the present study has been high (α = .92) and the convergent validity with measures of ADHD, depression, and anxiety symptoms seemed adequate as evidenced by correlations coefficients (r = −.64, −.66, and −.67, respectively; see Table 2).

Procedures. Patients with ADHD were evaluated during admission interviews at the specialized clinic of adult ADHD at INECO. All participants were assessed before initiating treatment with specific drugs for ADHD and CBT sessions in a group or individual format. The nonclinical comparison participants were recruited by word of mouth and collaborated voluntarily. Questionnaires were completed at home with the help of a research assistant. Non-ADHD clinical controls were evaluated during the initiation of psychotherapy treatment at INECO.

Statistical Analysis. Comparisons between groups were made using one-way ANOVA, followed by Tukey's Honestly Significant Difference (HSD) post hoc comparisons when appropriate. Correlations between measures were carried out employing the Pearson correlation coefficient. Hierarchical regression analysis was utilized to evaluate the predictive value of the different explicative variables included in the CBT model. Finally, when analyzing categorical variables, the Pearson chi-square test was employed.

Results

Demographic and Clinical Findings

The ADHD sample consisted of 35 participants (15 female and 20 male) with a mean age of 31.2 (SD = 9.47). The clinical control sample consisted of 20 participants (10 female and 10 male) with a mean age of 33.30 (SD = 10.99). The nonclinical control sample consisted of 20 participants (12 female and 8 male) with a mean age of 33.8 (SD = 12.53). No statistical differences were found between groups regarding age, $F(2, 72) = 0.45$, p = .640, or gender ($\chi^2 = 1.50$, $df = 2$, p = .472).

Table 1 summarizes clinical findings for the three groups. As expected, ADHD participants showed significantly higher scores in behavioral measures of ADHD symptoms than non-ADHD clinical participants and nonclinical control participants. In the ANOVA, there were significant between-group differences in the ADHD-RS-Total scale,

Table 3. Hierarchical Regression Models Predicting Emotional Symptoms from ADHD Symptoms and Dysfunctional Cognitions in the ADHD Sample (N = 35)

Dependent variable		Variable entered	*B*	*SE B*	β	*t*	*p*	ΔR^2	Total R^2	ΔF
BDI-II	Step 1							.25	.25	10.85**
		ADHD-RS-T	.75	.23	.50	3.30	.002			
	Step 2							.37	.63	30.83***
		ADHD-RS-T	.40	.17	.27	2.31	.028			
		ATQ-30	.30	.05	.65	5.55	<.001			
STAI-II	Step 1							.17	.17	6.18*
		ADHD-RS-T	.59	.24	.41	2.49	.019			
	Step 2							.56	.73	28.27***
		ADHD-RS-T	.22	.15	.16	1.47	.152			
		ATQ-30	.28	.05	.63	5.65	<.001			
		DAS	.09	.03	.30	2.84	.008			

Note: ADHD-RS-T = ADHD Rating Scale–Total Score; ATQ-30 = Automatic Thoughts Questionnaire-30; DAS = Dysfunctional Attitudes Scale; BDI-II = Beck Depression Inventory-II; STAI-T = State-Trait Anxiety Inventory–Trait subscale; *SE* = standard error.
*p < .05. **p < .01. ***p < .001.

$F(2, 69) = 67.52$, $p < .001$, ADHD-RS–Inattention subscale, $F(2, 69) = 78.14$, $p < .001$, and ADHD-RS-Hyperactivity-Impulsivity subscale, $F(2, 69) = 24.56$, $p < .001$. Post hoc tests showed that ADHD group had significantly higher scores in the three measures of ADHD symptoms than non-ADHD clinical and nonclinical control participants.

Hypothesis 1: Dysfunctional Cognitions. The two measures of dysfunctional cognitions yielded findings congruent with the hypothesis (see Table 1). First, significant differences between the groups were found for the scores of the ATQ-30 employed for assessing negative automatic thoughts, $F(2, 72) = 19.07$, $p < .001$. Post hoc tests revealed that ADHD and clinical control groups had significantly higher scores in the ATQ-30 than the nonclinical control group ($p < .001$ and $p = .001$, respectively). In contrast, as was expected, there were no differences between the two clinical groups ($p = .207$). Second, regarding dysfunctional attitudes, significant differences between groups were also obtained in the DAS scores, $F(2,72) = 14.49$, $p < .001$. Again, in the post hoc analysis, both clinical groups showed significantly higher scores than the nonclinical control group ($p < .001$), but no differences were found between them ($p = .919$).

Hypothesis 2: Emotional Symptoms. There were expected significant between-group differences in BDI-II, $F(2, 71) = 13.35$, $p < .001$, and STAI-R, $F(2, 69) = 30.16$, $p < .001$ (see Table 1). Post hoc tests revealed that both clinical groups had significantly higher scores in depression and anxiety than the nonclinical control group ($p < .001$ for the two comparisons). On the contrary, the ADHD group and non-ADHD clinical group did not differ significantly on BDI-II or STAI-R scores ($p = .972$ and $p = .893$, respectively).

In accordance with the hypothesis, the two measures of emotional symptoms were strongly associated with automatic thoughts scores in the ADHD sample (see Table 2). ATQ-30 scores were significantly correlated with BDI-II ($r = .75$, $p < .001$) and with STAI-T ($r = .79$, $p < .001$). In addition, dysfunctional attitudes measured with the DAS were correlated with STAI-T ($r = .54$, $p = .002$), but not with BDI-II ($r = .12$, $p = .488$). Finally, depression and anxiety scores were correlated with the measure of ADHD symptoms (ADHD-RS-T), but to a lesser extent than dysfunctional cognitions ($r = .50$, $p = .002$, for BDI-II and $r = .41$, $p = .019$, for STAI-T).

Hierarchical linear regression analyses were carried out to examine the impact of dysfunctional cognitions on depression (BDI-II) and anxiety (STAI-T; see Table 3 for a summary of the regression models). ADHD symptoms scores (ADHD-RS-T) were entered as covariates at Step 1 of the analyses. ATQ-30 scores were entered at Step 2 equally for depression and anxiety. DAS scores were entered for anxiety, but not for depression, because DAS and BDI-II scores were not correlated. For BDI-II, the model was significant at Step 1. ADHD symptoms scores alone predicted depressive symptoms, accounting for 25% of variance of the dependent variable. At Step 2, there was a significant improvement in the model when automatic thoughts scores were introduced, accounting for an additional 37% in variance. ADHD symptoms scores remained a significant predictor of depression after automatic thoughts scores were introduced. For the STAI-T, the regression model was significant at Step 1, with ADHD symptoms scores entering as a significant predictor of anxiety and accounting for a 17% of the variance. At Step 2, ATQ-30 and DAS scores were significant predictors of anxiety and significantly improved the model, accounting

Table 4. Hierarchical Regression Models Predicting Functional Impairment From ADHD Symptoms and Dysfunctional Cognitions in the ADHD Sample (N = 35)

Dependent variable		Variable entered	*B*	*SE B*	β	*t*	*p*	ΔR^2	Total R^2	ΔF
AAQoL	Step 1							.46	.46	25.56*
		ADHD-RS-T	−1.64	.325	−.68	−5.06	<.001			
	Step 2							.11	.57	7.225**
		ADHD-RS-T	−1.35	.316	−.56	−4.26	<.001			
		ATQ-30	−.27	.10	−.35	−2.69	.012			
	Step 3							.101	.67	4.101**
		ADHD-RS-T	−1.02	.32	−.42	−3.21	.003			
		ATQ-30	.10	.16	.14	.65	.520			
		BDI-II	−.41	.31	−.25	−1.33	.196			
		STAI-T	−.73	.32	−.43	−2.28	.031			

Note: ADHD-RS-T = ADHD Rating Scale–Total Score; ATQ-30 = Automatic Thoughts Questionnaire-30; DAS = Dysfunctional Attitudes Scale; BDI-II = Beck Depression Inventory-II; STAI-T = State-Trait Anxiety Inventory–Trait subscale; AAQoL = Adult ADHD Quality of Life Scale; *SE* = standard error.
*p < .001. **p < .05.

for an additional 56% of STAI-T variance. When introducing the measures of dysfunctional cognitions into the model, ADHD symptoms did not remain as a significant predictor of anxiety. In summary, regression analyses supported the hypothesis that dysfunctional cognitions would significantly predict the expression of emotional symptoms and that the automatic thoughts would be the strongest predictors of depression and anxiety.

Hypothesis 3: Coping Strategies. Between-group comparisons of coping strategies showed significant differences in three subscales of the WOCS: Escape-Avoidance (WOCS-EA), $F(2, 67) = 5.73$, $p = .005$; Planful Problem Solving (WOCS-PPS), $F(2, 67) = 4.55$, $p = .014$; and Positive Reappraisal (WOCS-PR), $F(2, 67) = 3.24$, $p = .046$ (see Table 1). In line with the hypothesis, post hoc tests confirmed that participants with ADHD presented elevated scores in the Escape-Avoidance subscale (WOCS-EA) in comparison with nonclinical control participants ($p = .017$). Meanwhile, clinical control participants presented higher scores than nonclinical control participants in the three aforementioned subscales (WOCS-EA, $p = .007$; WOCS-PPS, $p = .010$; and WOCS-PR, $p = .044$). No significant differences existed between clinical groups in any subscale.

In addition, the study explored relationships within the ADHD group between the scores of the subscales of the WOCS and the scores of ADHD symptoms, dysfunctional cognitions, and emotional symptoms (see Table 2). The Distancing subscale was significantly correlated with ATQ-30 scores ($r = .41$, $p = .019$), the Self-Controlling subscale was significantly correlated with ADHD-RS-T scores ($r = .36$, $p = .041$) and with ATQ-30 scores ($r = .38$, $p = .031$), and the Accepting Responsibility subscale was significantly correlated with ADHD-RS-T scores ($r = .37$, $p = .035$).

Hypothesis 4: Quality of Life. Total AAQoL scores were negatively correlated with ADHD symptoms (ADHD-RS; $r = -.64$, $p < .001$), automatic thoughts (ATQ-30; $r = -.55$, $p < .001$), depression symptoms (BDI-II; $r = -.66$, $p < .001$), and anxiety symptoms (STAI-T; $r = -.67$, $p < .001$; see Table 2).

Hierarchical linear regression analysis was employed to explore the relative predictive contribution of the different variables correlated with life outcome (AAQoL). ADHD symptom scores (ADHD-RS) were entered at Step 1, dysfunctional cognitions (ATQ-30) were entered at Step 2, and depression and anxiety scores (BDI-II and STAI-T) were entered at Step 3 (see Table 4). The regression model was significant at Step 1, with ADHD symptoms alone accounting for a 46% of the variance of the AAQoL scores. At Step 2, the model significantly increased its predictive value by 11%, ADHD-RS and ATQ-30 being significant predictors within the model. At Step 3, the model improved by an additional 10% when entering BDI-II and STAI-T, totaling 67% of variance of AAQoL explained by the composite model. At this final step, ADHD and STAI-T scores were significant predictors in the model, whereas ATQ-30 and BDI-II did not reach significance.

Finally, because ATQ-30 evidenced at Step 2 a significant effect over the dependant variable (AAQoL) that was reduced to nonsignificance when STAI-T was introduced at Step 3, and given also that ATQ-30 predicted STAI-T scores (see Table 3), then it was possible to consider that STAI-T was acting as a mediator between ATQ-30 and AAQoL. According to Baron and Kenny (1986), a variable may be said to function as a mediator to the extent that it accounts

for the relation between the predictor and the criterion. To test this idea, conditions for mediation according to Kenny et al. (1998) were revised. First, the independent variable (ATQ-30) should affect the dependent variable (AAQoL). This condition was accomplished at Step 2 of Table 4. Second, the independent variable (ATQ-30) should affect the mediator (STAI-T). This effect was evidenced at Step 2 of Table 3. Third, the mediator (STAI-T) should affect the dependent variable (AAQoL) when the independent variable (ATQ-30) is controlled for. This relationship became manifest at Step 3 of Table 4. Fourth, the association between the independent variable (ATQ-30) and dependent variable (AAQoL) should be reduced to nonsignificance after the mediator is introduced. This final condition is also revealed at Step 3 of Table 4. As a result, the four conditions for considering that STAI-T fully mediates the effect of ATQ-30 over AAQoL were accomplished. Thus, as indicated by this model, dysfunctional cognitions (ATQ-30) could be potentially considered as a distal factor that affects emotional symptoms (STAI-T), which in turn would impinge on quality of life (AAQoL).

Discussion

The aim of this study was to evaluate the CBT model of ADHD in adulthood. As predicted by this model, adult patients with ADHD showed elevated scores in measures of dysfunctional cognitions relative to nonclinical participants and comparable with other clinical participants. In addition, scores of dysfunctional cognitions were positively correlated with measures of depression or anxiety symptoms. As revealed by the regression analysis, dysfunctional cognitions more strongly predicted emotional symptoms than did symptoms of ADHD. Also in accordance with the model, participants with ADHD presented elevated scores in avoidant coping strategies, even if those scores were not clearly associated with dysfunctional cognitions or emotions. Finally, life impairment was satisfactorily predicted in data analysis when the scores of ADHD symptoms, dysfunctional cognitions, and emotional symptoms were fitted into a regression model. Thus, the obtained empirical findings were congruent with most of the CBT assumptions.

Most importantly, this study confirmed the presence of dysfunctional cognitions in this population and the strong association of these cognitions with emotional symptoms. Negative automatic thoughts and distorted beliefs constitute the core component of the CBT model; this is the first study to explore their explicit occurrence in adults with ADHD with specific instruments. Specifically, findings about negative automatic thoughts measured by the ATQ-30 fulfilled most of the expected hypothesis. Automatic thoughts were elevated in the ADHD sample and were positively correlated with the intensity of total ADHD symptoms. As assessed by the AAQoL scale, automatic thoughts were also strongly correlated with life impairment, as well as with anxiety and depression scores—even more than ADHD symptoms. Even if the ATQ-30 is not a specific measure for this population, the global nature of dysfunctional thoughts represented in this instrument seemed to capture quite well the emotional discomfort associated with ADHD. The other cognitive component of the model, dysfunctional attitudes, was also elevated in the ADHD sample, but it was correlated only with anxiety scores, failing to show additional associations with other variables of the model. On one hand, the fact that DAS scores were elevated in this population is congruent with the idea of a general emotional disturbance associated with the disease, also revealed by the correlation with anxiety scores. On the other hand, it is likely that a more specific set of maladaptive beliefs tied to the singular experience of ADHD rather than the general depressogenic–anxiogenic beliefs represented in the DAS would help to establish deeper connections between dysfunctional assumptions and further components of the CBT model.

The second finding of this study concerns the behavioral component of the CBT model. The obtained data showed the utilization of maladaptive compensatory strategies in adult persons with ADHD, although the pattern of results is more limited than that previously reported by Young (2005). Similar to Young's results, scores of the Escape-Avoidance subscale were elevated in the ADHD sample in comparison with nonclinical controls. This congruent finding confirms the relevance of this type of dysfunctional strategy to patients with ADHD, and it is also expressed in the clinical literature and reflected in CBT treatment manuals (Ramsay & Rostain, 2008; Safren, Sprich, Perlman, & Otto, 2005; Young & Bramham, 2007). Contrary to Young (2005), we found no differences in Confronting Coping or Planful Problem Solving between the ADHD sample and the nonclinical controls. In addition, elevated dysfunctional coping strategies appeared to be relatively isolated variables, unrelated to the cognitive and emotional components of the model. As was suggested for dysfunctional assumptions, the absence of associations with other components of the model in this case could be attributed to the general nature of coping behaviors represented in the WOCS, which perhaps lacks measurements of disease-specific strategies acquired by people with ADHD for coping with difficulties related with the disorder.

Also in contradiction with Young (2005), our data do not reveal the presence of positive reappraisal as an augmented adaptive strategy in the ADHD sample relative to the clinical and nonclinical control groups. This negative finding allows different conjectures regarding positive coping abilities as a putative resilience factor in adults with ADHD. First, it should be noted that neither Young's (2005) sample (N = 44) nor the present study's sample (N = 35) is big enough to infer firm conclusions about positive coping as a global trait in this population. Thus, further replications or a larger study exploring coping in adults with ADHD would be necessary to shed light about this issue. Second, variations in positive

coping and resilience could be attributed to individual differences rather than to a general characteristic of adult patients with ADHD. Therefore, different groups with diverse life trajectories could develop heterogeneous abilities for dealing with adversities. This frame is congruent with the idea of coping as an acquired disposition in ADHD. Third, it is also possible to relate coping strategies to the current clinical state of the individuals. In fact, participants in our sample showed elevated anxious and depressive symptoms, which are not easily compatible with a positive approach to difficulties. Furthermore, CBT model predicts that when negative schemas are activated, participants are more prone to use dysfunctional coping strategies than to use positive adaptive behaviors. However, because Young (2005) did not report clinical data besides coping measures, it is not possible to corroborate whether the different results obtained in the two studies are due to a disparity in clinical parameters like ADHD symptoms severity, depression, or anxiety.

Finally, the last relevant finding of this study relates to the predictive value of the components of cognitive-behavioral model in relation to everyday functional impairment. The hierarchical regression model showed that dysfunctional cognitions and emotional symptoms sequentially augmented the predictive power of primary ADHD symptoms for quality of life in participants with ADHD. In the final model, ADHD primary symptoms and emotional symptoms—evidenced through STAI-T—predicted quality of life, and conditions were met for considering that STAI-T also mediates in the final step the effect of dysfunctional cognitions over quality of life evidenced in the previous step of hierarchical regression. In other words, this finding is congruent with the CBT model's premise that the presence of cognitive and emotional disturbances sequentially worsens the life outcome of ADHD. In contrast, dysfunctional behavioral strategies failed to show their supposed impact on everyday functioning. There could be two reasons for this negative finding. First, it could be that coping behaviors influence functional outcome by reinforcing ADHD symptoms. In that case, dysfunctional coping scores should have been correlated with ADHD symptoms scores, but that did happen in a very restricted way. A second explanation, mentioned previously, is that the coping strategies included in the WOCS lack specificity for adults with ADHD.

Limitations of the Study

The main limitation of this study is the small sample size of the three groups. However, we do find significant effects, and patients did not differ from nonclinical and clinical controls in age, sex, or years of education. Moreover, in most cases, statistics were considerably robust, suggesting that they could be conserved, or even augmented, if the number of cases is increased. In addition, as another limitation, it should be noted that although several anticipated variables entered into the regression models as predicted, causal inferences about the relationship between CBT components are not guaranteed by the design of the present study. For this purpose, it would be necessary to incorporate longitudinal assessments of dysfunctional cognitions and behavioral strategies in studies that take into account different developmental stages.

Implications and Directions for Future Research

From a theoretical point of view, it appears that the notions of dysfunctional cognitions and of automatic negative thoughts in particular are empirically valid and useful constructs for understanding the complex expressions of disturbances acquired by adults with ADHD. In addition, from a clinical perspective, the association of negative cognitions with emotional symptoms in these patients supports the rationale assumed in the CBT treatments, adding theoretical validity to the available clinical evidence. Moreover, the present results reinforce the importance of adding psychological therapies to address cognitive-behavioral issues.

As a matter for further research, a potential distinction between two broad categories of dysfunctional cognitions and behaviors emerges from this study. This distinction separates general emotion-related dysfunctional cognitions and behaviors that are actually associated with depression and anxiety, such as those evaluated in this study, from disorder-specific dysfunctional cognitions and behaviors that are presumably linked with ADHD primary symptoms and functional outcome. To test this hypothesis, it would be necessary to develop ADHD-specific measures of automatic thoughts, dysfunctional assumptions, maladaptive behavioral strategies, and schematic contents. These measures would allow the exploration of the relationship between components of CBT that have not been confirmed in the present study, such as the association of dysfunctional assumptions with maladaptive strategies and the impact of the latter on ADHD symptomatology and everyday outcome. In addition, it would be possible to consider alternative roles of dysfunctional cognitions in ADHD, for example, automatic thoughts as distractors during task execution, or as sources of dismotivation during the preparation phase of due activities (Ramsay, 2010; Torrente et al., 2011).

It would be also informative to explore differences in cognitive-behavioral constructs between specific subgroups of adults with ADHD. First, the expression of dysfunctional cognitions could be compared between the different subtypes of ADHD. In a previous report (Torrente et al., 2011), we suggested that motivational deficits in participants with ADHD combined subtype could be related with cognitive-behavioral issues, meanwhile more severe motivational deficits in participants with ADHD predominantly inattentive subtype could be attributed to primary neurocognitive

deficits. This hypothesis could be tested through the exploration of dysfunctional cognitions in the two subtypes separately. Second, it could be explored whether gender or age exerts any influence over the expression of dysfunctional cognitions within ADHD population. In particular, regarding age effects, it is conceivable that cognitive-behavioral correlates of ADHD worsen as a result of accumulative impairment or when environmental demands increase. Third, it could be helpful to investigate whether dysfunctional beliefs are present in participants with less severe forms of ADHD—for example, college students with a good academic fit or participants without comorbidity. Likewise, future research with participants with a more benign course of ADHD could be an opportunity for exploring positive coping strategies that could work as resilience factors. Finally, as dysfunctional cognitions and behaviors are therapeutic targets of CBT, it is possible to wonder how much they change before and after treatment, and whether change in cognitions is related with the outcome in ADHD primary symptoms and everyday functioning.

Conclusion

As a whole, it emerges as a corollary of this investigation that there is direct empirical support for the cognitive-behavioral conceptualization of ADHD in adulthood. In this sense, the CBT model appears as a valid and useful complement to the neurocognitive model of ADHD for understanding associated emotional disturbances and everyday functional impairment. Finally, additional research is needed to characterize specific content and alternative functions of dysfunctional cognitions and behavioral strategies in adults with ADHD, as well as subgroups differences.

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References

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington DC: Author.

Barkley, R. A., Fischer, M., Smallish, L., & Fletcher, K. (2006). Young adult outcome of hyperactive children: Adaptive functioning in major life areas. *Journal of the American Academy of Child and Adolescent Psychiatry, 45*, 192-202.

Barkley, R. A., & Murphy, K. R. (1998). *Attention-deficit hyperactivity disorder: A clinical workbook* (2nd ed.). New York, NY: Guilford.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*, 1173-1182.

Beck, A. T. (1964). Thinking and depression II: Theory and therapy. *Archives of General Psychiatry, 10*, 561-571.

Beck, A. T. (1976). *Cognitive therapy and the emotional disorders*. New York, NY: Meridian.

Beck, A. T. (2008). The evolution of the cognitive model of depression and its neurobiological correlates. *American Journal of Psychiatry, 165*, 969-977.

Beck, A. T., Rush, A. J., Shaw, B. F., & Emery, G. (1979). *Cognitive therapy of depression*. New York, NY: Guilford.

Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *Manual for the Beck Depression Inventory-II*. San Antonio, TX: Psychological Corporation.

Beck, J. (2011). *Cognitive therapy: Basics and beyond* (2nd ed.). New York, NY: Guilford.

Beck, R., & Perkins, T. S. (2001). Cognitive content-specificity for anxiety and depression: A meta-analysis. *Cognitive Therapy and Research, 25*, 651-663.

Biederman, J., Monuteaux, M. C., Mick, F., Spencer, T., Wilens, T. E., Silva, J. M., . . . Faraone, S. V. (2006). Young adult outcome of attention deficit hyperactivity disorder: A controlled 10-year follow-up study. *Psychological Medicine, 36*, 167-179.

Blase, S. L., Gilbert, A. N., Anastopoulos, A. D., Costello, E. J., Hoyle, R. H., Swartzwelder, H. S., & Rabiner, D. L. (2009). Self-reported ADHD and adjustment in college: Cross-sectional and longitudinal findings. *Journal of Attention Disorders, 13*, 297-309.

Brenlla, M. E. & Rodríguez, C. M. (2006). Adaptación argentina del Inventario de Depresión de Beck (BDI-II) [Argentine adaptation of the Beck Depression Inventory (BDI-II)]. In A. T. Beck, R. A. Steer, & G. K. Brown (Eds.), *BDI-II. Inventario de Depresión de Beck* (2nd ed., pp. 11-37) [BDI-II. Beck Depression Inventory]. Buenos Aires: Paidós.

Brod, M., Johnston, J., Able, S., & Swindle, R. (2006). Validation of the adult attention-deficit/hyperactivity disorder quality-of-life Scale (AAQoL): A disease-specific quality-of-life measure. *Quality of Life Research, 15*, 117-129.

Canu, W. H., & Carlson, C. L. (2007). Rejection sensitivity and social outcomes of young adult men with ADHD. *Journal of Attention Disorders, 10*, 261-275.

First, M. B., Spitzer, R. L., Gibbon, M., & Williams, J. B. W. (1998). *Structured Clinical Interview for DSM-IV Axis I Disorders, Research Version, Patient Edition With Psychotic Screen (SCID-I/P W/PSY SCREEN)* (Bilingual ed.). New York, NY: Biometrics Research, New York State Psychiatry Institute and The Behavioral Sciences Research Institute, University of Puerto Rico.

Folkman, S., & Lazarus, R. S. (1985). If it changes it must be a process: Study of emotion and coping during three stages of a college examination. *Journal of Personality and Social Psychology, 48*, 150-170.

Gudjonsson, G. H., Sigurdsson, J. F., Eyjolfsdottir, G. A., Smari, J., & Young, S. (2009). The relationship between satisfaction with life, ADHD symptoms, and associated problems among university students. *Journal of Attention Disorders, 12*, 507-515.

Hechtman, L., Weiss, G., & Perlman, T. (1980). Hyperactives as young adults: Self-esteem and social skills. *Canadian Journal of Psychiatry, 25*, 478-483.

Hollon, S. D., & Kendall, P. C. (1980). Cognitive self-statements in depression: Development of an Automatic Thoughts Questionnaire. *Cognitive Therapy and Research, 4*, 383-395.

Hoza, B., Pelham, W. E., Jr., Dobbs, J., Owens, J. S., & Pillow, D. R. (2002). Do boys with attention-deficit/hyperactivity disorder have positive illusory self-concepts? *Journal of Abnormal Psychology, 111*, 268-278.

Kenny, D. A., Casi, D. A., & Bolger, N. (1998). Data analysis in social psychology. In D. T. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (vol. 1, pp. 233-265). New York, NY: Oxford University Press.

Knouse, L. E., Cooper-Vince, C., Sprich, S., & Safren, S. A. (2008). Recent developments in the psychosocial treatment of adult ADHD. *Expert Review of Neurotherapeutics, 8*, 1537-1548.

Kuiper, N. A., Olinger, L. J., & Martin, R. A. (1988). Dysfunctional attitudes, stress, and negative emotions. *Cognitive Therapy and Research, 12*, 533-547.

Leibovich de Figueroa, N. B. (1991). Ansiedad: Algunas concepciones teóricas y su evaluación [Anxiety: theoretical conceptions and assessment]. In M. M. Casullo, N. Leibovich de Figueroa, & M. Aszkenazi (Eds.), *Teoría y técnicas de evaluación psicológica* [Theory and techniques of psychological assessment] (pp. 121-154). Buenos Aires, Argentina: Psicoteca.

Murphy, K. R., & Gordon M. (2006). Assessment of adults with ADHD. In R. A. Barkley (Ed.), *Attention-deficit hyperactivity disorder: A handbook for diagnosis and treatment* (3rd ed., pp. 425-452). New York, NY: Guilford.

Owens, J. S., Goldfine, M. E., Evangelista, N. M., Hoza, B., & Kaiser, N. M. (2007). A critical review of self-perceptions and the positive illusory bias in children with ADHD. *Clinical Child and Family Psychology Review, 10*, 335-351.

Ramsay, J. R. (2010). CBT for adult ADHD: Adaptations and hypothesized mechanisms of change. *Journal of Cognitive Psychotherapy, 24*, 37-45.

Ramsay, J. R., & Rostain, A. L. (2008). *Cognitive behavioral therapy for adult ADHD: An integrative psychosocial and medical approach*. New York, NY: Routledge.

Safren, S. A. (2006). Cognitive-behavioral approaches to ADHD treatment in adulthood. *Journal of Clinical Psychiatry, 67*, 46-50.

Safren, S. A., Otto, M. W., Sprich, S., Winett, C. L., Wilens, T. E., & Biederman, J. (2005). Cognitive-behavioral therapy for ADHD in medication-treated adults with continued symptoms. *Behavior Research & Therapy, 43*, 831-842.

Safren, S. A., Sprich, S., Mimiaga, M. J., Surman, C., Knouse, L., Groves, M., & Otto, M. W. (2010). Cognitive behavioral therapy vs relaxation with educational support for medication-treated adults with ADHD and persistent symptoms: A randomized controlled trial. *Journal of the American Medical Association, 304*, 875-880.

Safren, S. A., Sprich, S., Perlman, C. A., & Otto, M. W. (2005) *Mastering Your Adult ADHD.* New York: Guilford Press.

Shaw-Zirt, B., Popali-Lehane, L., Chaplin, W., & Bergman, A. (2005). Adjustment, social skills, and self-esteem in college students with symptoms of ADHD. *Journal of Attention Disorders, 8*, 109-120.

Slomkowski, C., Klein, R. G., & Manuzza, S. (1995). Is self-esteem an important outcome in hyperactive children? *Journal of Abnormal Child Psychology, 23*, 303-315.

Solanto, M. V., Marks, D. J., Wasserstein, J., Mitchell, K., Abikoff, H., Alvir, J. M., & Kofman, M.D. (2010). Efficacy of meta-cognitive therapy for adult ADHD. *American Journal of Psychiatry, 167*, 958-968.

Spielberger, C. D., Gorsuch, R. L., & Lushene, R. E. (1970). *Manual for the State-Trait Anxiety Inventory*. Palo Alto, CA: Consulting Psychologist Press.

Stevenson, C. S., Whitmont, S., Bornholt, L., Livesey, D., & Stevenson, R. J. (2002). A cognitive remediation programme for adults with attention deficit hyperactivity disorder. *Australian and New Zealand Journal of Psychiatry, 36*, 610-616.

Torralva, T., Gleichgerrcht, E., Torrente, F., Roca, M., Strejilevich, S. A., Cetkovich, M., . . . Manes, F. (2011). Neuropsychological functioning in adult bipolar disorder and ADHD patients: A comparative study. *Psychiatry Research, 186*, 261-266.

Torrente, F., Lischinsky, A., Torralva, T., Lopez, P., Roca, M., & Manes, F. (2011). Not always hyperactive? Elevated apathy scores in adolescents and adults with ADHD. *Journal of Attention Disorders, 15*, 545-556.

Weich, S., Churchill, R., & Lewis, G. (2003). Dysfunctional attitudes and the common mental disorders in primary care. *Journal of Affective Disorders, 75*, 269-278.

Weissman, A. N., & Beck, A. T. (1978, March). *Development and validation of the Dysfunctional Attitudes Scale: A preliminary investigation.* Paper presented at Proceedings of the meeting of the American Educational Research Association, Toronto, Ontario, Canada.

Weiss, M., Safren, S. A., Solanto, M. V., Hechtman, L., Rostain, A. L., Ramsay, J. R., & Murray, C. (2008). Research forum on psychological treatment of adults with ADHD. *Journal of Attention Disorders, 11*, 642-651.

Wilmshurst, L., Peele, M., & Wilmshurst, L. (2011). Resilience and well-being in college students with and without a diagnosis of ADHD. *Journal of Attention Disorders, 15*, 11-17.

Young, S. (2005). Coping strategies used by adults with ADHD. *Personality and Individual Differences, 38*, 809-816.

Young, S., & Bramham, J. (2007). *ADHD in adults: A psychological guide to practice*. Chichester, England: Wiley.

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