



HAL
open science

Beyond motor hyperactivity

Émilie Martz, Gilles Bertschy, Charlotte Kraemer, Sebastien Weibel, Luisa
Weiner

► **To cite this version:**

Émilie Martz, Gilles Bertschy, Charlotte Kraemer, Sebastien Weibel, Luisa Weiner. Beyond motor hyperactivity. *Psychiatry Research*, 2021, 10.1016/j.psychres.2021.113988 . hal-03471655

HAL Id: hal-03471655

<https://hal.science/hal-03471655v1>

Submitted on 24 May 2023

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution - NonCommercial 4.0 International License

Beyond motor hyperactivity: racing thoughts are an integral symptom of adult Attention Deficit Hyperactivity Disorder

Emilie Martz^{a,b,*}, Gilles Bertschy^{b,c}, Charlotte Kraemer^c, Sébastien Weibel^{b,c}, Luisa Weiner^{a,c,d}

^a University of Strasbourg, Strasbourg, France

^b INSERM U1114, Strasbourg, France

^c Psychiatry Department, University Hospital of Strasbourg, Strasbourg, France

^d Laboratoire de Psychologie des Cognitions, University of Strasbourg, Strasbourg, France

* Corresponding author:

Emilie Martz – University of Strasbourg, 4 rue Blaise Pascal, 67081, Strasbourg, France.

INSERM U1114, University Hospital of Strasbourg, 1 place de l'Hôpital, 67000, Strasbourg, France.

e-mail: emilie.martz@etu.unistra.fr

phone number: +33 3 88 11 66 48

1. Introduction

1 Racing thoughts refer to a subjective acceleration and overproduction of thoughts
2 which have been essentially associated with mania/hypomania in bipolar disorder (BD; Piguet
3 et al., 2010), and are considered as pathognomonic of manic thinking (APA, 2013; Goodwin
4 & Jaminson, 2007). However, whether or not racing thoughts are specific to manic episodes
5 has become a matter of debate (Piguet et al., 2010), as recent studies have found self-reported
6 racing thoughts in healthy individuals (Weiner et al., 2018), in bipolar depression (Weiner et
7 al., 2019a), but also in patients with primary insomnia (Bertschy et al., 2020; Weiner et al.,
8 2019b). In the latter case, self-reported racing thoughts is comparable to that reported by
9 hypomanic BD patients, and it is strongly associated with insomnia severity, especially in the
10 evening and at bedtime (Weiner et al., 2019b).

11 If racing thoughts are not pathognomonic of BD, they seem nevertheless to be strongly
12 related to the affective instability that is characteristic of the disorder. Hence it is possible that
13 racing thoughts can be observed in other conditions whereby affective instability is present,
14 such as insomnia and Attention Deficit Hyperactivity Disorder (ADHD; Bertschy et al.,
15 2020).

16 ADHD is a frequent neurodevelopmental disorder, affecting 2.5-4 % of adults (Fayyad
17 et al., 2007; Retz et al., 2011; Simon et al., 2009). ADHD is characterized by persistent and
18 impairing levels of inattention and/or hyperactivity and impulsivity (APA, 2013). Typically,
19 three clinical presentations have been described: i.e., inattentive, hyperactive-impulsive and
20 combined presentations (APA, 2013; Kooij et al., 2010; Zalsman & Shilton, 2016). In
21 addition to this triad of symptoms, recent studies have suggested that affective dysregulation
22 is a core symptom in adult ADHD (Hirsch et al., 2019; Reimherr et al., 2020), as cyclothymic
23 temperament traits have been reported in up to 71% of adults (Landaas et al., 2012).

24 Affective dysregulation, along with other symptoms shared by adults with ADHD and
25 patients with BD, can make the differential diagnosis particularly difficult in clinical settings
26 (Asherson et al., 2014). In both disorders, distractibility, irritability, talkativeness, motor
27 agitation and insomnia can be found (Asherson, 2005; Asherson et al., 2014; Brus et al., 2014;
28 Skirrow et al., 2012). Moreover, comorbidity rates between the two disorders are particularly
29 high, as 5 to 32 % of adults with ADHD also have a BD diagnosis (Halmøy et al., 2010;
30 Kessler et al., 2006; Skirrow et al., 2012; Wingo & Ghaemi, 2007).

31 Racing thoughts has been suggested to be a distinctive symptom of BD relative to
32 ADHD (Galanter et al., 2005; Luckenbaugh et al., 2009), but most studies have been
33 conducted in children (Geller et al., 1998, 2002; Luby & Belden, 2006), and none have
34 investigated racing thoughts specifically (Asherson et al., 2014; Klassen et al., 2010). In
35 addition, the phenomenological distinction between racing thoughts and the distractibility
36 typically reported in ADHD is not clear. Indeed, ADHD patients report very often a ‘mental
37 restlessness’ (Asherson, 2005; Weyandt et al., 2003), akin to racing thoughts (Bertschy et al.,
38 2020). Thus, the phenomenon can be either considered as ‘distractibility’ or as ‘racing
39 thoughts’ by clinicians. Adding to this complexity, recent research has suggested that racing
40 thoughts is a multi-faceted phenomenon including three types of thinking: i.e., (i) ‘thought
41 overactivity’ referring to the excessive amount and velocity of thoughts, (ii) ‘burden of
42 thought overactivation’ evoking the overwhelming impact of thought overactivation, and (iii)
43 ‘thought overexcitability’, reflecting the distractibility that is a hallmark of racing thoughts
44 (Weiner et al., 2018; Weiner et al., 2019a) and also of ADHD symptomatology.

45 The main clinical difference might lie in the trait versus state dimension of the racing
46 thoughts phenomenon. Indeed, ‘distractibility’ is considered as a trait-dimension in ADHD
47 whereas ‘racing thoughts’ is a state dimension found during mood episodes of BD (Asherson,
48 2005). However, intra-individual symptom expression in ADHD can vary over time, and such

49 might also be the case for racing thoughts. For instance, Tonetti et al., (2017) found that
50 ADHD patients display several peaks of motor activity especially by the end of the day
51 (Tonetti et al., 2017, 2018). This suggests that, if patients with ADHD present with trait
52 racing thoughts, this symptom can nevertheless vary following a circadian pattern with an
53 increase at the end of the day akin to motor activity. If such is the case, racing thoughts should
54 increase in the evening and at the bedtime and affect sleep onset (Weiner et al., 2019b). This
55 would be consistent with the clinical description of ‘mental restlessness’ provided by
56 Asherson (2005), which has been hypothesized to be related to insomnia severity (Bertschy et
57 al., 2020). Moreover, affective instability and sleep difficulties seem to entertain a
58 relationship in ADHD (Helfer et al., 2019; Becker et al., 2020).

59 The aim of the present study is to investigate self-reported racing thoughts in ADHD,
60 as well as its link to cyclothymic temperament, ADHD symptoms and insomnia severity. To
61 do so, we will compare on the 13-item Racing and Crowded Thoughts Questionnaire (RCTQ-
62 13; Weiner et al., 2019a) in adults with ADHD, adults with the comorbid presentation
63 ADHD+BD, and BD patients in hypomanic and euthymic episodes. We hypothesize that self-
64 reported racing thoughts will be higher in ADHD compared to euthymic subjects and will be
65 lower compared to hypomanic and comorbid patients. Since distractibility is a core feature of
66 ADHD, it was expected that the ‘thought overexcitability’ factor of the RCTQ-13 would be a
67 prominent dimension of racing thoughts in ADHD. Moreover, given that cyclothymic traits
68 are strongly related to racing thoughts (Weiner et al., 2018), cyclothymic traits in ADHD are
69 expected to be linked to racing thoughts (Syrstad et al., 2020). Finally, given the fluctuating
70 nature of ADHD symptoms, racing thoughts are expected to follow a circadian pattern in
71 adults with ADHD, with an increase in the evening and at bedtime, and this variation will be
72 linked to insomnia severity.

2. Method

2.1 – Participants

73 For this cross-sectional study, 182 adults newly diagnosed with ADHD ($M=32.78$
74 years, $SD=10.63$; 47.80% female), and 30 adults presenting with the ADHD+BD comorbidity
75 ($M=38.47$ years, $SD=12.10$) were recruited from the outpatient psychiatry clinics of the
76 University Hospital of Strasbourg. ADHD and BD diagnoses were established by senior
77 psychiatrists based on the DSM-5 criteria for each of these disorders (APA, 2013). According
78 to these criteria, comorbid patients were euthymic, that is, they did not present with neither
79 with a depressive nor (hypo)manic episode (APA, 2013). Among the ADHD and ADHD+BD
80 groups, the combined presentation was the most prevalent subtype (67.58% and 73.33%
81 respectively), followed by the inattentive (29.67% and 20% respectively) and the hyperactive
82 subtypes (respectively 2.75% and 6.67%). Because of the small sample size ($n=5$),
83 predominantly hyperactive ADHD patients were excluded from the analyses. Patients were
84 excluded if they presented with a current major depressive episode, autism spectrum
85 disorders, anxiety disorders and/or borderline personality disorder. ADHD patients were not
86 taking any psychostimulant drugs.

87 Thirty-one patients with BD in a hypomanic episode ($M=40.82$ years, $SD=13.39$) and
88 20 patients with BD in a euthymic episode ($M=26.68$ years, $SD=7.62$) were recruited in a
89 previous study led by our group (Weiner et al., 2019). Manic symptoms were measured via
90 the Young Mania Rating Scale in the BD sample (YMRS, Young et al., 1978). BD patients
91 did not present with ADHD, borderline personality disorder and substance use disorder.

92 Subjects provided written informed consent prior to inclusion in the. This study was
93 approved by the regional ethics committee of the East of France (CPP EST IV).

2.2 – Measures and procedure

94 All the groups completed the racing thoughts and the anxiety measures. Following the
95 clinical assessment ADHD and ADHD+BD patients only completed the following self-report
96 questionnaires:

97 Adult ADHD Self-Report Scale (ASRS; Adler et al., 2006) is a two-factor 18-item
98 self-report questionnaire assessing inattention and hyperactivity/impulsivity in the 6 last
99 months.

100 The Racing and Crowded Thoughts Questionnaire-13-item (RCTQ-13; Weiner et al.,
101 2019b) is a 13-item self-reported questionnaire assessing 3 facets of racing thoughts during
102 the last 24 hours – i.e., thought overactivation, burden of thought overactivation and thought
103 overexcitability.

104 The RCTQ Circadian scale contains 4 items, which retrospectively assess the
105 frequency of racing thoughts of 4 specific circadian moments during the past 24 hours -- i.e.,
106 morning, afternoon, evening, and bedtime.

107 Anxiety and depression symptoms were respectively assessed by the 21-item Beck
108 Anxiety Inventory (BAI; Beck et al., 1988) and the 21-item Beck Depression Inventory (BDI-
109 II; Beck et al., 1996).

110 The Temperament Evaluation of Memphis, Pisa, Paris, and San Diego
111 Autoquestionnaire (TEMPS-A, Akiskal et al., 2005) is a self-report, 39-item questionnaire
112 designed to assess affective temperaments via five subscales: (i) cyclothymic temperament,
113 (ii) depressive temperament, (iii) irritable temperament, (iv) hyperthymic temperament, and
114 (v) anxious temperament.

115 The Insomnia Severity Index (ISI, Bastien et al., 2001) is a 7-item self-reported
116 questionnaire assessing insomnia symptoms.

2.3 – Statistical analyses

117 To compare demographical and clinical variables between groups, one-way ANOVA
118 (continuous variables) and Chi square (categorical variables) were used. Because of the non-
119 parametric distribution of the data, Kruskal-Wallis tests were conducted to compare RCTQ
120 subscales ordinal scores between groups. Post-hoc comparisons were conducted using the
121 Dunn test, adjusted for multiple comparisons via the Bonferroni correction (Dunn, 1961;
122 Bonferroni, 1936). Statistical significance was set a 0.05. To evaluate the circadian variation
123 of racing thoughts Friedman tests were used. The relation between racing thoughts circadian
124 variation and insomnia severity was assessed via the calculation of the Spearman correlation
125 coefficient. To partial out the specific contribution of ADHD and mood symptoms on the
126 three RCTQ subscale scores in the ADHD groups only, multiple regression analyses were
127 carried out. Analyses were performed using the Statistica and Jasp softwares.

3. Results

3.1 – Clinical and demographic data in the ADHD group

128 Compared to the ADHD-inattentive group, the ADHD-combined group showed
129 greater scores on several clinical measures, including hyperactivity, depressive symptoms,
130 cyclothymic temperament, and insomnia severity ($p<.001$, $p=.007$, $p<.001$ and $p=.04$
131 respectively), but not on inattention ($p=0.58$). Depressive symptoms were higher in the
132 ADHD+BD compared to the ADHD group ($p=.03$). Euthymic patients had diminished
133 anxiety symptoms (BAI) compared to all the other groups ($p<.05$). Detailed demographic and
134 clinical data are presented in table 1.

3.2 – Comparison of RCTQ subscale scores between groups

135 Scores differed significantly between groups on the ‘thought overactivation’ subscale,
136 the ‘burden of thoughts overactivation’ subscale and the ‘thought overexcitability’ subscale

137 ($p < .001$ for the three subscales; Table 1). Post-hoc tests revealed that scores on the three
138 RCTQ subscales were higher in the ADHD-combined group relative to the ADHD-inattentive
139 group, and the hypomanic BD group and the euthymic subjects ($p < .05$ for the three factors),
140 but scores did not differ between ADHD-combined and ADHD+BD participants ($p = 1$ for the
141 three subscales). Scores on the three factors did not differ between the ADHD-inattentive
142 group and the hypomanic BD group ($p = .1$, $p = .33$ and $p = 0.84$, respectively), but were higher
143 compared to the euthymic patients ($p < .001$ for the three subscales). Results were unchanged
144 when patients with ADHD under psychotropic medication were excluded from the analyses
145 ($n = 23$).

3.3 – Circadian variation of racing thoughts and insomnia severity in adults with ADHD and ADHD+BD

3.3.1. Circadian variation of racing thoughts

146 Racing thoughts circadian scores were higher in the evening and at bedtime in the
147 ADHD-combined and the ADHD+BD groups compared to morning and afternoon, but not in
148 the ADHD-inattentive group (Friedman test, $p < .001$; Figure 1).

3.3.2. Insomnia severity and racing thoughts

149 Only the ‘burden of thought overactivation’ subscale score was associated with
150 insomnia severity in the ADHD-inattentive group ($p = .01$). The severity of racing thoughts in
151 the morning and afternoon was negatively related to insomnia severity in the ADHD-
152 combined group ($p = .033$ and $p = .003$, respectively), whereas at bedtime it was positively
153 correlated with insomnia severity ($p = .003$). In the ADHD-inattentive group, both racing
154 thoughts in the evening and at bedtime were significantly correlated with insomnia severity
155 ($p = .009$ and $p < .001$) (Table 2).

3.4 – Multiple regression analyses

156 Multiple regressions analyses were conducted in the ADHD-Combined and the
157 ADHD-Inattentive groups separately to partial out the specific contribution of ADHD and
158 mood symptoms on the three RCTQ subscale scores. Five predictors – the ASRS, the BAI,
159 BDI and TEMPS-Cyclothymia scores – were simultaneously entered into the model.

160 In the ADHD-Combined group, regarding the ‘thought overactivation’, the burden of
161 ‘thought activation’ and ‘thought overexcitability’ RCTQ scales (Table 3), the predictors
162 accounted for respectively 8.9%, 15.6% and 6.2% of the variance, and the TEMPS-A
163 Cyclothymia subscale was the main predictor of scores (respectively, $\beta=0.26$, $p=.01$; $\beta=0.33$,
164 $p<.001$; $\beta=0.28$, $p=.006$). Hyperactive-impulsive symptoms predicted ‘thought overactivation’
165 only ($\beta=0.30$, $p=.02$).

166 In the ADHD-Inattentive group, the five predictors accounted for 28.7% of the
167 variance in the ‘thought overactivation’ subscale scores with significant contributions from
168 the BAI and the ASRS-Hyperactive scores ($\beta=0.30$, $p=.05$ and $\beta=0.30$, $p=.03$; Table 4).
169 Regarding the ‘burden of thought activation’ and ‘thought overexcitability’ subscales, the
170 predictors accounted for 29.4% and 26% of the variance respectively, but none of the
171 individual variables predicted scores on this RCTQ subscale.

4. Discussion

172 Our study is the first to show that racing thoughts found in ADHD are more severe
173 than those found in euthymic patients, and, more surprisingly, in hypomania as well (in the
174 combined ADHD presentation). Moreover, racing thoughts seem to be intrinsically related to
175 ADHD. Indeed, RCTQ scores did not differ between the comorbid ADHD+BD group and the
176 ADHD combined-presentation group, hence suggesting that racing thoughts in ADHD are not

177 due to comorbid BD. These results are surprising inasmuch as racing thoughts have been
178 considered as pathognomonic of BD, and their presence was thought to be a marker of
179 comorbid BD in ADHD (Geller et al., 1998, 2002). However, self-reported racing thoughts
180 differed according to the clinical presentation of ADHD. Indeed, the combined-presentation
181 subgroup showed greater scores on the three factors of the RCTQ-13 compared to the
182 inattentive ADHD subgroup, suggesting that hyperactivity in the combined presentation
183 includes not only motor hyperactivity, but also thoughts overactivity.

184 Regarding the phenomenology of racing thoughts, the RCTQ-13 ‘thought
185 overexcitability’ facet, akin to distractibility, distinguished racing thoughts in ADHD and in
186 BD. This is consistent with the clinical observations reported by Asherson (2005) according
187 to which fleetingness was characteristic of the thinking patterns of adults with ADHD.
188 Nevertheless, it is not the inattentive symptoms that seem to be involved in the overexcitable
189 nature of racing thoughts in the ADHD combined-presentation, but affective dysregulation. In
190 the ADHD inattentive presentation group, similar to results found in BD (Weiner et al.,
191 2019a), anxiety symptoms and hyperactive-impulsive symptoms were significantly related to
192 RCTQ ‘thought overactivation’ scores. The inattentive ADHD presentation in adults can be
193 conceptualized as an evolution of the combined presentation in childhood (Willcutt, 2012). It
194 is thus possible that hyperactivity does not disappear but is rather internalized, contributing to
195 racing thoughts and hyperarousal. These findings suggest that hyperactivity, hyperarousal and
196 anxiety, but not cyclothymic traits, might contribute to racing thoughts in inattentive
197 individuals.

198 The difference between the inattentive and the combined ADHD subtypes can be
199 explained by the relationship between cyclothymic temperament traits and racing thoughts, on
200 the one hand, and the link between affective dysregulation and the hyperactivity found in the
201 combined presentation only, on the other hand. In the combined ADHD group, cyclothymic

202 temperament traits were higher than in the inattentive ADHD group and contribute to racing
203 thoughts, replicating findings from healthy subjects and primary insomnia (Weiner et al.,
204 2018; Weiner et al., 2019b). Furthermore, hyperactive-impulsive symptoms also predicted the
205 ‘thought overactivation’ facet in ADHD, reflective of pressure of thought (Weiner et al.,
206 2018). Mental pressure and restlessness are comparable to the motor pressure experienced by
207 adults with the combined ADHD presentation. Moreover, racing thoughts and psychomotor
208 agitation are part of the same symptomatic cluster found in mixed BD episodes (Hantouche et
209 al., 2006; Keizer et al., 2014). Since affective dysregulation is strongly associated with
210 hyperactivity symptoms in ADHD (Corbisiero et al., 2017; Marchant et al., 2013; Skirrow &
211 Asherson, 2013), it is possible that cyclothymic traits and motor hyperactivity are intrinsically
212 related in ADHD, and contribute to racing thoughts. These shared symptoms might make the
213 differential diagnosis with BD and the ADHD+BD comorbid presentation particularly
214 challenging (Perroud et al., 2014).

215 Interestingly, we found that racing thoughts in ADHD, especially the combined type,
216 followed a circadian pattern, with an evening and bedtime increase. Hence although
217 ‘ceaseless mental activity’ has been identified as a trait-symptom (Asherson, 2005), racing
218 thoughts seems to vary in ADHD throughout the day. This suggests that racing thoughts
219 might be state-dependent in at least a subset of subjects with ADHD, i.e., those presenting
220 with the most severe hyperactivity symptoms, and these fluctuations follow a rapid
221 intradiurnal cycle. Hence the temporal stability of racing thoughts cannot aid, alone, the
222 differential diagnosis with BD, especially rapid cycling BD, and BD+ADHD.

223 The circadian variation of racing thoughts might be related to a prominent evening
224 preference chronotype in ADHD (Coogan & McGowan, 2017). Unlike our results, which
225 suggest that racing thoughts are increased in the evening and at bedtime in the combined
226 ADHD subtype only, evening preference has been reported to be predominantly associated

227 with inattentive symptoms in ADHD (Bae et al., 2010) and to be more prevalent in the ADHD
228 inattentive subtype (Caci et al., 2009). It is thus possible that sleep problems differ according
229 to predominant ADHD symptoms (Yoon, 2015), with more frequent insomnia symptoms in
230 combined-ADHD patients (Brevik et al., 2017), especially those experiencing increased
231 racing thoughts in the evening and at bedtime. Indeed, in our study, increased racing thoughts
232 at bedtime were associated with insomnia severity in ADHD, similar to results reported in
233 patients with primary insomnia (Weiner et al., 2019a). This is consistent with Asherson's
234 (2005) suggestion that the 'ceaseless mental activity' found in adult ADHD could be involved
235 in sleep-onset difficulties.

236 There are some limitations to this study. First, consistent with the prevalence rates of
237 ADHD subtypes found in other studies (e.g., Millstein et al., 1997; Wilens et al., 2002), our
238 hyperactive ADHD group was small and could not be included in the analyses. Further
239 studies are needed focusing on this specific group, and how hyperactivity alone is related to
240 racing thoughts. Second, in our study racing thoughts were subjectively assessed and manic
241 symptoms were not quantitatively assessed in ADHD groups. However, scores on the three
242 RCTQ subscales and the clinician-rated measure of racing thoughts in the YMRS (Young et
243 al., 1978) have been found to be significantly correlated in a previous study (Weiner et al.,
244 2019a), hence suggesting that self-reported measures of racing thoughts are valid. Moreover,
245 given that adults with ADHD and ADHD+BD did not meet criteria for (hypo)manic episodes,
246 it seems unlikely that subthreshold hypomanic symptoms can account for our results. Third,
247 we did not directly assess chronotype preference in our study, hence the relationship between
248 racing thoughts and evening preference in ADHD remains to be thoroughly studied. Fourth,
249 most patients with BD, including those with ADHD+BD, were under medication. Given that
250 racing thoughts were heightened in ADHD+BD compared to BD alone, on the one hand, and

251 equivalent in ADHD, on the other hand, it seems unlikely that medication status in patients
252 with BD can fully account for our results.

253 In conclusion, our study is the first to investigate racing thoughts in adults with
254 ADHD. Surprisingly, this symptom is more marked in the ADHD combined subtype, than in
255 BD, making the differential diagnosis between the two clinical conditions particularly
256 challenging. Since racing thoughts seem to be an overlapping symptom between ADHD and
257 BD rather than a distinctive feature, clinicians should focus on other potential distinctive
258 symptoms, and consider racing thoughts - and not only motor hyperactivity - as a feature
259 intrinsically related to ADHD.

References:

- Adler, L.A., Spencer, T., Faraone, S.V., Kessler, R.C., Howes, M.J., Biederman, J., Secnik, K., 2006. Validity of pilot Adult ADHD Self- Report Scale (ASRS) to Rate Adult ADHD symptoms. *Ann Clin Psychiatry* 18, 145–148.
<https://doi.org/10.1080/10401230600801077>
- Akiskal, H.S., Mendlowicz, M.V., Jean-Louis, G., Rapaport, M.H., Kelsoe, J.R., Gillin, J.C., Smith, T.L., 2005. TEMPS-A: validation of a short version of a self-rated instrument designed to measure variations in temperament. *Journal of Affective Disorders, TEMPS: Temperament Evaluation of Memphis, Pisa, Paris and San Diego* 85, 45–52.
<https://doi.org/10.1016/j.jad.2003.10.012>
- Asherson, P., 2005. Clinical assessment and treatment of attention deficit hyperactivity disorder in adults. *Expert Review of Neurotherapeutics* 5, 525–539.
<https://doi.org/10.1586/14737175.5.4.525>
- Asherson, P., Young, A.H., Eich-Höchli, D., Moran, P., Porsdal, V., Deberdt, W., 2014. Differential diagnosis, comorbidity, and treatment of attention-deficit/hyperactivity disorder in relation to bipolar disorder or borderline personality disorder in adults. *Current Medical Research and Opinion* 30, 1657–1672.
<https://doi.org/10.1185/03007995.2014.915800>
- Asherson, P., Buitelaar, J., Faraone, S.V., Rohde, L.A., 2016. Adult attention-deficit hyperactivity disorder: key conceptual issues. *The Lancet Psychiatry* 3, 568–578.
[https://doi.org/10.1016/S2215-0366\(16\)30032-3](https://doi.org/10.1016/S2215-0366(16)30032-3)
- Association, A.P., 2013. *Diagnostic and Statistical Manual of Mental Disorders (DSM-5®)*. American Psychiatric Pub.
- Bae, S.M., Park, J.E., Lee, Y.J., Cho, I.H., Kim, J.H., Koh, S.H., Kim, S.J., Cho, S.J., 2010. Gender difference in the association between adult attention deficit hyperactivity disorder symptoms and morningness–eveningness. *Psychiatry and Clinical Neurosciences*, 64(6), 649-651. <https://doi.org/10.1111/j.1440-1819.2010.02140.x>
- Bastien, C.H., Vallières, A., Morin, C.M., 2001. Validation of the Insomnia Severity Index as an outcome measure for insomnia research. *Sleep Medicine* 2, 297–307.
[https://doi.org/10.1016/S1389-9457\(00\)00065-4](https://doi.org/10.1016/S1389-9457(00)00065-4)
- Beck, A.T., Epstein, N., Brown, G., Steer, R.A., 1988. An inventory for measuring clinical anxiety: psychometric properties. *J. Consult. Clin. Psychol.* 56, 893-897.
- Beck, A.T., Steer, R.A., & Brown, G.K., 1996. *Manual for the Beck Depression Inventory-*

II. San Antonio, TX: Psychological Corporation.

- Bertschy, G., Weibel, S., Giersch, A., Weiner, L., 2020. Racing and crowded thoughts in mood disorders: A data-oriented theoretical reappraisal. *L'Encéphale* 46(3), 202-208. <https://doi.org/10.1016/j.encep.2020.01.007>
- Bijlenga, D., Van Someren, E.J.W., Gruber, R., Bron, T.I., Kruithof, I.F., Spanbroek, E.C. A., & Kooij, J.J.S., 2013. Body temperature, activity and melatonin profiles in adults with attention-deficit/hyperactivity disorder and delayed sleep: A case-control study. *Journal of Sleep Research*, 22(6), 607-616. <https://doi.org/10.1111/jsr.12075>
- Bonferroni, C.E., 1936. Teoria statistica delle calssi e calcolo delle probabilità, *Pubblicazioni del R Istituto Superiore di Schienze Economiche e Commerciali di Firenze* 8, 1-62.
- Brevik, E.J., Lundervold, A.J., Halmøy, A., Posserud, M.-B., Instanes, J.T., Bjorvatn, B., Haavik, J., 2017. Prevalence and clinical correlates of insomnia in adults with attention-deficit hyperactivity disorder. *Acta Psychiatrica Scandinavica* 136, 220–227. <https://doi.org/10.1111/acps.12756>
- Brus, M., Solanto, M., Goldberg, J., 2014. Adult ADHD vs. Bipolar Disorder in the DSM-5 Era: A Challenging Differentiation for Clinicians. *Journal of Psychiatric Practice* 20, 428–437. <https://doi.org/10.1097/01.pra.0000456591.20622.9e>
- Caci, H., Bouchez, J., Baylé, F.J., 2009. Inattentive Symptoms of ADHD Are Related to Evening Orientation: *Journal of Attention Disorders* 13, 36-41. <https://doi.org/10.1177/1087054708320439>
- Coogan, A.N., McGowan, N.M., 2017. A systematic review of circadian function, chronotype and chronotherapy in attention deficit hyperactivity disorder. *ADHD Atten. Def. Hyp. Disord.* 9, 129–147. <https://doi.org/10.1007/s12402-016-0214-5>
- Corbisiero, S., Mörstedt, B., Bitto, H., Stieglitz, R.-D., 2017. Emotional Dysregulation in Adults With Attention-Deficit/Hyperactivity Disorder–Validity, Predictability, Severity, and Comorbidity. *Journal of Clinical Psychology* 73, 99–112. <https://doi.org/10.1002/jclp.22317>
- Dunn, O.J., 1961. Multiple Comparisons among Means. *Journal of the American Statistical Association*, 56(293), 52-64. <https://doi.org/10.1080/01621459.1961.10482090>
- Fayyad, J., Graaf, R.D., Kessler, R., Alonso, J., Angermeyer, M., Demyttenaere, K., Girolamo, G.D., Haro, J.M., Karam, E.G., Lara, C., Lépine, J.P., Ormel, J., Posada-Villa, J., Zaslavsky, A.M., Jin, R., 2007. Cross-national prevalence and correlates of adult attention-deficit hyperactivity disorder. *The British Journal of Psychiatry* 190(5), 402–409. <https://doi.org/10.1192/bjp.bp.106.034389>

- Galanter, C.A., Pagar, D.L., Davies, M., Li, W., Carlson, G.A., Abikoff, H.B., Eugene Arnold, L., Bukstein, O.G., Pelham, W., Elliott, G.R., Hinshaw, S., Epstein, J.N., Wells, K., Hechtman, L., Newcorn, J.H., Greenhill, L., Wigal, T., Swanson, J.M., Jensen, P.S., 2005. ADHD and manic symptoms: Diagnostic and treatment implications. *Clinical Neuroscience Research, Attention Deficit Hyperactivity Disorder (ADHD)* 5, 283–294. <https://doi.org/10.1016/j.cnr.2005.09.008>
- Geller, B., Williams, M., Zimmerman, B., Frazier, J., Beringer, L., Warner, K.L., 1998. Prepubertal and early adolescent bipolarity differentiate from ADHD by manic symptoms, grandiose delusions, ultra-rapid or ultradian cycling. *Journal of Affective Disorders* 51, 81–91. [https://doi.org/10.1016/S0165-0327\(98\)00175-X](https://doi.org/10.1016/S0165-0327(98)00175-X)
- Geller, B., Zimmerman, B., Williams, M., DelBello, M.P., Frazier, J., Beringer, L., 2002. Phenomenology of Prepubertal and Early Adolescent Bipolar Disorder: Examples of Elated Mood, Grandiose Behaviors, Decreased Need for Sleep, Racing Thoughts and Hypersexuality. *Journal of Child and Adolescent Psychopharmacology* 12, 3–9. <https://doi.org/10.1089/10445460252943524>
- Gibbins, C., Weiss, M.D., Goodman, D.W., Hodgkins, P.S., Landgraf, J.M., Faraone, S.V., 2010. ADHD-hyperactive/impulsive subtype in adults. *Mental Illness* 2, 41–45. <https://doi.org/10.4081/mi.2010.e9>
- Goodwin, F.K., Jamison, K.R., 2007. *Manic-Depressive Illness: Bipolar Disorders and Recurrent Depression*. Oxford University Press, USA.
- Halmøy, A., Helleland, H., Dramsdahl, M., Bergsholm, P., Fasmer, O.B., Haavik, J., 2010. Bipolar Symptoms in Adult Attention-Deficit/Hyperactivity Disorder: A Cross-Sectional Study of 510 Clinically Diagnosed Patients and 417 Population-Based Controls. *J Clin Psychiatry* 71, 48–57. <https://doi.org/10.4088/JCP.08m04722ora>
- Hantouche, E.G., Akiskal, H.S., Azorin, J.M., Châtenet-Duchêne, L., Lancrenon, S., 2006. Clinical and psychometric characterization of depression in mixed mania: A report from the French National Cohort of 1090 manic patients. *Journal of Affective Disorders, Circular Insanity: French Psychiatry's Impact on the Field of Mood Disorders* 96, 225–232. <https://doi.org/10.1016/j.jad.2005.01.005>
- Helfer, B., Cooper, R. E., Bozhilova, N., Maltezos, S., Kuntsi, J., & Asherson, P., 2019. The effects of emotional lability, mind wandering and sleep quality on ADHD symptom severity in adults with ADHD. *European Psychiatry* 55, 45-51. <https://doi.org/10.1016/j.eurpsy.2018.09.006>
- Hirsch, O., Chavanon, M.L., Christiansen, H., 2019. Emotional dysregulation subgroups in

- patients with adult Attention-Deficit/Hyperactivity Disorder (ADHD): a cluster analytic approach. *Scientific Reports* 9, 1–11. <https://doi.org/10.1038/s41598-019-42018-y>
- Ishihara, K., Miyasita, A., Inugami, M., Fukuda, K., Miyata, Y., 1987. Differences in Sleep-Wake Habits and EEG Sleep Variables between Active Morning and Evening Subjects. *Sleep*, 10(4), 330-342. <https://doi.org/10.1093/sleep/10.4.330>
- Keizer, I., Keizer, Ineke, Piguet, C., Favre, S., Aubry, J.-M., Dayer, A., Gervasoni, N., Gex-Fabry, M., Bertschy, G., 2014. Subjective Experience of Thought Overactivation in Mood Disorders: Beyond Racing and Crowded Thoughts. *PSP* 47, 174–184. <https://doi.org/10.1159/000354781>
- Kessler, R.C., Adler, L., Barkley, R., Biederman, J., Conners, C.K., Demler, O., Faraone, S.V., Greenhill, L.L., Howes, M.J., Secnik, K., Spencer, T., Ustun, T.B., Walters, E.E., Zaslavsky, A.M., 2006. The Prevalence and Correlates of Adult ADHD in the United States: Results From the National Comorbidity Survey Replication. *AJP* 163, 716–723. <https://doi.org/10.1176/ajp.2006.163.4.716>
- Klassen, L.J., Katzman, M.A., Chokka, P., 2010. Adult ADHD and its comorbidities, with a focus on bipolar disorder. *Journal of Affective Disorders* 124, 1–8. <https://doi.org/10.1016/j.jad.2009.06.036>
- Kooij, J.S.J., Bejerot, S., Blackwell, A., Caci, H., Casas-Brugué, M., Carpentier, P.J., Edvinsson, D., Fayyad, J., Foeken, K., Fitzgerald, M., Gaillac, V., Ginsberg, Y., Henry, C., Krause, J., Lensing, M.B., Manor, I., Niederhofer, H., Nunes-Filipe, C., Ohlmeier, M.D., Oswald, P., Pallanti, S., Pehlivanidis, A., Ramos-Quiroga, J.A., Rastam, M., Ryffel-Rawak, D., Stes, S., Asherson, P., 2010. European consensus statement on diagnosis and treatment of adult ADHD: The European Network Adult ADHD. *BMC Psychiatry* 10, 67. <https://doi.org/10.1186/1471-244X-10-67>
- Landaas, E.T., Halmøy, A., Oedegaard, K.J., Fasmer, O.B., Haavik, J., 2012. The impact of cyclothymic temperament in adult ADHD. *Journal of Affective Disorders* 142, 241–247. <https://doi.org/10.1016/j.jad.2012.04.034>
- Luby, J., Belden, A., 2006. Defining and validating bipolar disorder in the preschool period. *Development and Psychopathology*, 18(4), 971-988. <https://doi.org/10.1017/S0954579406060482>
- Luckenbaugh, D.A., Findling, R.L., Leverich, G.S., Pizzarello, S.M., Post, R.M., 2009. Earliest symptoms discriminating juvenile-onset bipolar illness from ADHD. *Bipolar Disorders*, 11(4), 441-451. <https://doi.org/10.1111/j.1399-5618.2009.00684.x>

- Marchant, B.K., Reimherr, F.W., Robison, D., Robison, R.J., Wender, P.H., 2013. Psychometric properties of the Wender-Reimherr Adult Attention Deficit Disorder Scale. *Psychological Assessment* 25, 942–950. <https://doi.org/10.1037/a0032797>
- Millstein, R.B., Wilens, T.E., Biederman, J., Spencer, T.J., 1997. Presenting ADHD symptoms and subtypes in clinically referred adults with ADHD: *Journal of Attention Disorders* 2(3), 159-166. <https://doi.org/10.1177/108705479700200302>
- Organization, W.H., 2004. ICD-10: international statistical classification of diseases and related health problems: tenth revision. World Health Organization.
- Otoni, G.L., Antonioli, E., Lara, D.R., 2011. The Circadian Energy Scale (CIRENS): Two Simple Questions for a Reliable Chronotype Measurement Based on Energy. *Chronobiology International* 28, 229–237. <https://doi.org/10.3109/07420528.2011.553696>
- Otoni, G.L., Antonioli, E., Lara, D.R., 2012. Circadian Preference Is Associated With Emotional and Affective Temperaments. *Chronobiology International* 29, 786–793. <https://doi.org/10.3109/07420528.2012.679329>
- Perroud, N., Cordera, P., Zimmermann, J., Michalopoulos, G., Bancila, V., Prada, P., Dayer, A., Aubry, J.-M., 2014. Comorbidity between attention deficit hyperactivity disorder (ADHD) and bipolar disorder in a specialized mood disorders outpatient clinic. *Journal of Affective Disorders* 168, 161–166. <https://doi.org/10.1016/j.jad.2014.06.053>
- Piguet, C., Dayer, A., Kosel, M., Desseilles, M., Vuilleumier, P., Bertschy, G., 2010. Phenomenology of racing and crowded thoughts in mood disorders: A theoretical reappraisal. *Journal of Affective Disorders* 121, 189–198. <https://doi.org/10.1016/j.jad.2009.05.006>
- Reimherr, F.W., Marchant, B.K., Gift, T.E., Steans, T.A., Wender, P.H., 2015. Types of adult attention-deficit hyperactivity disorder (ADHD): baseline characteristics, initial response, and long-term response to treatment with methylphenidate. *ADHD Atten Def Hyp Disord* 7, 115–128. <https://doi.org/10.1007/s12402-015-0176-z>
- Reimherr, F.W., Roesler, M., Marchant, B.K., Gift, T.E., Retz, W., Philipp-Wiegmann, F., Reimherr, M.L., 2020. Types of Adult Attention-Deficit/Hyperactivity Disorder: A Replication Analysis. *J Clin Psychiatry* 81. <https://doi.org/10.4088/JCP.19m13077>
- Retz, W., Retz-Junginger, P., Thome, J., Rösler, M., 2011. Pharmacological treatment of adult ADHD in Europe. *The World Journal of Biological Psychiatry* 12, 89–94. <https://doi.org/10.3109/15622975.2011.603229>

- Simon, V., Czobor, P., Bálint, S., Mészáros, Á., Bitter, I., 2009. Prevalence and correlates of adult attention-deficit hyperactivity disorder: meta-analysis. *The British Journal of Psychiatry* 194, 204–211. <https://doi.org/10.1192/bjp.bp.107.048827>
- Skirrow, C., Hosang, G.M., Farmer, A.E., Asherson, P., 2012. An update on the debated association between ADHD and bipolar disorder across the lifespan. *Journal of Affective Disorders* 141, 143–159. <https://doi.org/10.1016/j.jad.2012.04.003>
- Skirrow, C., Asherson, P., 2013. Emotional lability, comorbidity and impairment in adults with attention-deficit hyperactivity disorder. *Journal of Affective Disorders*, 147, 80–86. <https://doi.org/10.1016/j.jad.2012.10.011>
- Snitselaar, M.A., Smits, M.G., Heijden, K.B. van der, Spijker, J., 2013. Sleep and Circadian Rhythmicity in Adult ADHD and the Effect of Stimulants: A Review of the Current Literature. *Journal of Attention Disorders* 21, 14-26. <https://doi.org/10.1177/1087054713479663>
- Syrstad, V.E.G., Oedegaard, K.J., Fasmer, O.B., Halmoy, A., Haavik, J., Dilsaver, S., Gjestad, R., 2020. Cyclothymic temperament: Associations with ADHD, other psychopathology, and medical morbidity in the general population. *Journal of Affective Disorders* 260, 440–447. <https://doi.org/10.1016/j.jad.2019.08.047>
- Tonetti, L., Conca, A., Giupponi, G., Natale, V., 2017. Circadian pattern of motor activity in adults with attention-deficit/hyperactivity disorder. *Chronobiology International* 34, 802–807. <https://doi.org/10.1080/07420528.2017.1309660>
- Tonetti, L., Conca, A., Giupponi, G., Filardi, M., Natale, V., 2018. Circadian activity rhythm in adult attention-deficit hyperactivity disorder. *Journal of Psychiatric Research* 103, 1–4. <https://doi.org/10.1016/j.jpsychires.2018.05.002>
- Van Veen, M.M., Kooij, J.J.S., Boonstra, A.M., Gordijn, M.C.M., Someren, E.J.W.V., 2010. Delayed Circadian Rhythm in Adults with Attention-Deficit/Hyperactivity Disorder and Chronic Sleep-Onset Insomnia. *Biological Psychiatry* 67, 1091–1096. <https://doi.org/10.1016/j.biopsych.2009.12.032>
- Weiner, L., Weibel, S., de Sousa Gurgel, W., Keizer, I., Gex-Fabry, M., Giersch, A., Bertschy, G., 2018. Measuring racing thoughts in healthy individuals: The Racing and Crowded Thoughts Questionnaire (RCTQ). *Comprehensive Psychiatry* 82, 37–44. <https://doi.org/10.1016/j.comppsy.2018.01.006>
- Weiner, L., Ossola, P., Causin, J.-B., Deseilles, M., Keizer, I., Metzger, J.-Y., Krafes, E.G., Monteil, C., Morali, A., Garcia, S., Marchesi, C., Giersch, A., Bertschy, G., Weibel, S., 2019a. Racing thoughts revisited: A key dimension of activation in bipolar

- disorder. *Journal of Affective Disorders* 255, 69–76.
<https://doi.org/10.1016/j.jad.2019.05.033>
- Weiner, L., Ramos-Siegel, N., Gurcay, G., Ossola, P., Weibel, S., Bertschy, G., Bourgin, P., Kilic-Huck, Ü., 2019b. La tachypsychie dans l'insomnie primaire : vers une meilleure caractérisation d'un symptôme clinique clé ? *Médecine du Sommeil, Le Congrès du Sommeil* 16, 62–63. <https://doi.org/10.1016/j.msom.2019.01.125>
- Weyandt, L.L., Iwaszuk, W., Fulton, K., Ollerton, M., Beatty, N., Fouts, H., Schepman, S., Greenlaw, C., 2003. The Internal Restlessness Scale: Performance of College Students With and Without ADHD. *Journal of Learning Disabilities* 36 (4), 382-389.
<https://doi.org/10.1177/00222194030360040801>
- Wilens, T.E., Biederman, J., Spencer, T.J., 2002. Attention Deficit/Hyperactivity Disorder Across the Lifespan. *Annu. Rev. Med.* 53, 113–131.
<http://dx.doi.org/10.1146/annurev.med.53.082901.103945>
- Wilens, T.E., Biederman, J., Wozniak, J., Gunawardene, S., Wong, J., Monuteaux, M., 2003. Can adults with attention-deficit/hyperactivity disorder be distinguished from those with comorbid bipolar disorder? Findings from a sample of clinically referred adults. *Biological Psychiatry* 54, 1–8. [https://doi.org/10.1016/S0006-3223\(02\)01666-9](https://doi.org/10.1016/S0006-3223(02)01666-9)
- Willcutt E.G., 2012. The Prevalence of DSM-IV Attention-Deficit/Hyperactivity Disorder: A Meta-Analytic Review. *Neurotherapeutics* 9(3), 490-499.
<https://doi.org/10.1007/s13311-012-0135-8>
- Wingo, A.P., Ghaemi, S.N., 2007. A Systematic Review of Rates and Diagnostic Validity of Comorbid Adult Attention-Deficit/Hyperactivity Disorder and Bipolar Disorder. *J Clin Psychiatry* 68, 1776–1784.
- Yoon, S.Y.R., 2015. Sleep in Adults with Attention-Deficit/Hyperactivity Disorder of the Predominantly Inattentive and Combined Subtypes. Doctoral thesis. University of Toronto, Toronto, Canada.
- Young, R.C., Biggs, J.T., Ziegler, V.E., Meyer, D.A., 1978. A Rating Scale for Mania: Reliability, Validity and Sensitivity. *Br. J. Psychiatry.* 133(5), 429-435.
<https://doi.org/10.1192/bjp.133.5.429>
- Zalsman, G., Shilton, T., 2016. Adult ADHD: A new disease? *International Journal of Psychiatry in Clinical Practice* 20, 70–76.
<https://doi.org/10.3109/13651501.2016.1149197>

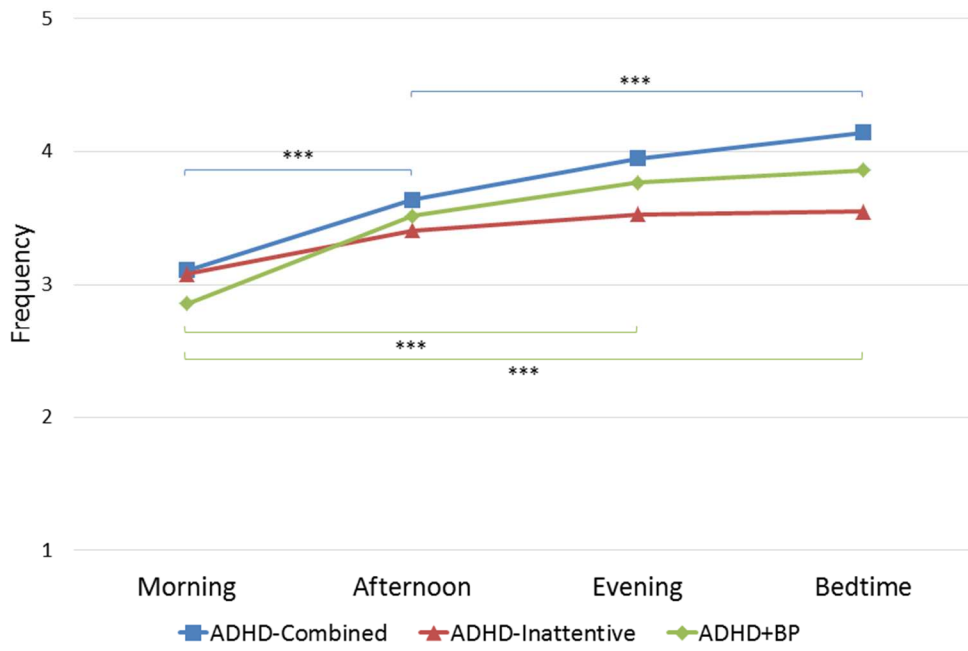


Figure 1. Racing thoughts frequency depending on daytime moment for the ADHD and ADHD+BP groups (* $p < .05$, ** $p < .01$, *** $p < .001$)

Table 1. Demographic and clinical variables of each group (**p* < .05, ***p* < .01, ****p* < .001)

	ADHD- Combined (n = 123)	ADHD- Inattentive (n = 54)	ADHD+BP (n = 30)	Hypomanic (n = 31)	Euthymic (n = 20)	p
Age	33.98 (10.18)	29.5 (11.07)	38.47 (12.10)	40.29 (14.30)	43.7 (13.88)	< .001*
Gender	62 M (50.41%) 61 F (49.59%)	30 M (55.56%) 24 F (44.44%)	12 M (40%) 18 F (60%)	12 M (38.71%) 19 F (61.29%)	10 M (50%) 10 F (50%)	.51
Years of education	14.34 (2.45)	13.93 (2.49)	14.89 (2.75)	14.55 (2.16)	15.05 (2.33)	0.39
Current medications:						
<i>Antidepressants</i>	10 (8.13%)	5 (9.26%)	3 (10%)	3 (9.68%)	5 (25%)	/
<i>Anxiolytics</i>	7 (5.69%)	2 (3.70%)	3 (10%)	6 (19.35%)	2 (10%)	/
<i>Mood stabilizers</i>	3 (2.44%)	3 (5.56%)	12 (40%)	10 (32.26%)	14 (70%)	/
RCTQ-13 Total Score	36.26 (10.72)	28.59 (15.14)	36.1 (13.53)	23.52 (15.23)	5.05 (7.03)	< .001*
<i>Thought overactivation</i>	12.18 (3.59)	9.56 (5.01)	11.73 (4.57)	8.77 (5.57)	1.75 (2.36)	< .001*
<i>Burden of thought overactivation</i>	10.60 (4.09)	8.28 (4.97)	10.87 (4.67)	5.84 (5.51)	1.5 (2.65)	< .001*
<i>Thought overexcitability</i>	13.48 (4.55)	10.76 (6.24)	13.5 (5.36)	8.90 (5.96)	1.8 (2.53)	< .001*
ASRS Inattention	27.06 (5.84)	26.06 (6.07)	26.57 (6.37)	/	/	.58
ASRS Hyperactivity	24.17 (5.55)	16.07 (7.02)	22.13 (5.51)	/	/	< .001*
YMRS	/	/	/	12.03 (3.45)	1.15 (1.63)	< .001*
BAI	15.46 (10.14)	11.51 (10.15)	17.71 (9.80)	14.77 (12.12)	3.95 (3.43)	.03*
BDI	19.66 (10.65)	14.24 (11.90)	25.45 (9.95)	/	/	< .001*
TEMPS – Cyclothymia	21.29 (7.84)	14.93 (8.97)	23.20 (6.91)	/	/	< .001*
ISI	13 (5.56)	10.61 (6.76)	14.27 (5.97)	/	/	.013*

Note: RCTQ = Racing and Crowded Thought Questionnaire; ASRS = Adult ADHD Self-Report Scale; YMRS = Young Mania Rating Scale; BAI = Beck Anxiety Inventory; BDI = Beck Depression Inventory; TEMPS = Temperament Evaluation of Memphis, Pisa, Paris, and San Diego Autoquestionnaire ; ISI = Insomnia Severity Index.

ADHD presentation prevalence among the ADHD+BP group: 73.33% combined, 20% inattentive, 6.67% hyperactive.

Table 2. Correlations analyses between RCTQ subscales and the Insomnia Severity Index in the ADHD group (* $p < .05$, ** $p < .01$, *** $p < .001$)

	Insomnia Severity Index		
	ADHD- Combined (n = 123)	ADHD- Inattentive (n = 54)	ADHD+BP (n = 49)
RCTQ-13 – Thought Overactivation	0.02	0.22	0.14
RCTQ-13 – Burden of Thought Overactivation	0.07	0.30*	0.15
RCTQ-13 – Thought Overexcitability	-0.02	0.20	-0.19
RCTQ-13 – Morning	-0.20*	0.15	0.21
RCTQ-13 – Afternoon	-0.27**	-0.03	0.22
RCTQ-13 – Evening	0.02	0.37**	0.22
RCTQ-13 – Bedtime	0.27*	0.47***	0.16

Note: RCTQ-13 = Racing and Crowded Thoughts Questionnaire-13-item

Table 3. Multiple regression analyses predictors for the ADHD-Combined group (n = 123)

	RCTQ – Thought Overactivation ^a			RCTQ – Burden of Thought Overactivation ^b			RCTQ – Thought Overexcitability ^c		
	β	<i>t</i>	<i>p</i>	β	<i>t</i>	<i>p</i>	β	<i>t</i>	<i>p</i>
ASRS Inattention	-0.04	-0.38	0.70	0.12	1.21	0.23	-0.01	-0.12	0.90
ASRS Hyperactivity	0.24	2.42	0.02*	0.07	0.70	0.49	0.09	0.84	0.40
BAI	-0.01	-0.11	0.91	0.07	0.63	0.53	0.02	0.21	0.84
BDI	0.01	0.10	0.92	0.10	0.96	0.34	0.03	0.27	0.79
TEMPS – Cyclothymia	0.26	2.59	0.01*	0.33	3.41	.001*	0.28	2.78	.006*

Note: RCTQ = Racing and Crowded Thoughts Questionnaire; ASRS = Adult ADHD Self-Report Scale; BAI = Beck Anxiety Inventory; BDI = Beck Depression Inventory; TEMPS = Temperament Evaluation of Memphis, Pisa, Paris, and San Diego Autoquestionnaire.

*t**p* < .10, **p* < .05

^a*R*² = 0.13 adjusted *R*² = 0.089, *F*(5, 104) = 3.135, *p* = .01

^b*R*² = 0.19 adjusted *R*² = 0.156, *F*(5, 104) = 5.02 *p* < .001

^c*R*² = 0.105 adjusted *R*² = 0.062, *F*(5, 104) = 2.44, *p* = .04

Table 4. Multiple regression analyses predictors for the ADHD-Inattentive group (n = 54)

	RCTQ – Thought Overactivation ^a			RCTQ – Burden of Thought Overactivation ^b			RCTQ – Thought Overexcitability ^c		
	β	<i>t</i>	<i>p</i>	β	<i>t</i>	<i>p</i>	β	<i>t</i>	<i>p</i>
ASRS Inattention	0.21	1.60	.12	0.23	1.77	.08†	0.21	1.58	.12
ASRS Hyperactivity	0.30	2.24	.03*	0.13	0.99	.32	0.22	1.63	.11
BAI	0.30	2.04	.05*	0.27	1.80	.08†	0.16	1.04	.30
BDI	-0.04	-0.28	.78	0.05	0.34	.73	-0.09	-0.58	.67
TEMPS – Cyclothymia	0.04	0.30	.76	0.17	1.18	.25	0.26	1.72	.09†

Note: RCTQ = Racing and Crowded Thoughts Questionnaire; ASRS = Adult ADHD Self-Report Scale; BAI = Beck Anxiety Inventory; BDI = Beck Depression Inventory; TEMPS = Temperament Evaluation of Memphis, Pisa, Paris, and San Diego Autoquestionnaire.

†*p* < .10, **p* < .05

^a*R*² = 0.356 adjusted *R*² = 0.287, *F*(5, 47) = 5.187, *p* < .001

^b*R*² = 0.362 adjusted *R*² = 0.294, *F*(5, 47) = 5.34, *p* < .001

^c*R*² = 0.331 adjusted *R*² = 0.26, *F*(5, 47) = 4.65, *p* = .001