

ADHD and Suicidal Ideation: The Roles of Emotion Regulation and Depressive Symptoms Among College Students

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Abstract

Objective: ADHD appears to increase risk for both depression and suicidal ideation, while ADHD and depression are also associated with emotion regulation deficits. Thus, we evaluated the degree to which depression mediated the association between ADHD and suicidal ideation, as well as the degree to which emotion regulation deficits moderated the association ADHD shared with depression and suicidal ideation in a nonclinical sample. **Method:** Participants were undergraduate psychology students ($N = 627$; age: $M = 20.23$, $SD = 1.40$; 60% female; 47% European American) who completed an online assessment. **Results:** Results indicated that ADHD indirectly increased suicidal ideation through depression. Emotion regulation deficits of accepting negative emotions, emotional awareness, and goal-oriented behavior moderated the indirect effect of ADHD on suicidal ideation. **Conclusion:** Depression appears to play an important mediating role in suicidal ideation for college students with ADHD, and specific emotion regulation deficits appear to amplify the effects of ADHD on depression and suicidal ideation. (*J. of Att. Dis.* 2015; 19(8) 703-714)

Keywords

suicide, ADHD, depression, emotion regulation, young adults

As the second leading cause of death among individuals aged 18 to 25 years (Centers for Disease Control and Prevention, 2011), suicide represents a significant public health problem. In a national survey, 6.4% of college students reported past year suicidal ideation (SI; American College Health Association [ACHA], 2009), a strong predictor of attempt (Borges et al., 2010). Although Major Depressive Disorder (MDD) symptoms predict SI (Cavanagh, Carson, Sharpe, & Lawrie, 2003), impulsive disorders, (e.g., ADHD) not only increase SI risk (Chronis-Tuscano et al., 2010), but also more strongly predict progression from ideation to attempt than depression (Nock et al., 2013).

Given that ADHD increases risk for depressive symptoms (Angold, Costello, & Erkanli, 1999; Chronis-Tuscano et al., 2010) and the strong link between depression and SI, depressive symptoms may mediate the link between ADHD and SI. Little research explains why ADHD increases risk for SI, demonstrating the need to evaluate possible mechanisms. Emotion regulation (ER) deficits are frequently associated with negative emotionality for those with ADHD (Marx et al., 2011), suggesting that ER deficits may amplify risk for depressive symptoms and SI for college students with ADHD symptoms (Seymour et al., 2011). Thus, we evaluated the mediating role of depressive symptoms in the

link between ADHD and SI and the extent to which ER moderates these associations.

ADHD, Depression, and Suicide Risk

Although research suggests that ADHD may increase risk of SI (Hinshaw et al., 2012; James, Lai, & Dahl, 2004), little research has evaluated potential mechanisms. In a meta-analysis on the link between ADHD and suicide, individuals with ADHD displayed 2.91 times the risk of attempting suicide than controls (James et al., 2004). Individuals with a childhood ADHD diagnosis were almost twice as likely to consider suicide and 7 times as likely to attempt suicide in high school compared with those without ADHD in a longitudinal follow-up study (Barkley & Fischer, 2005). By

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young adulthood, those with a previous ADHD diagnosis were still 2.6 times more likely to have considered suicide than controls.

Depressive symptoms, which are frequently associated with suicidal behavior, may underlie the link between suicide risk and ADHD. However, results regarding the link between ADHD and depressive symptoms have yielded both positive (Biederman, Petty, Evans, Small, & Faraone, 2010; Chronis-Tuscano et al., 2010) and negative findings (Hinshaw et al., 2012), and only one study has explored the relation among ADHD, depression, and suicide risk. In that longitudinal study, Barkley and Fischer (2005) found that children who had both a childhood diagnosis of ADHD and considered suicide in high school were much more likely to have MDD (49%), compared with children with a childhood diagnosis of ADHD and no SI (10%). Results also extended to SI in young adulthood (63% vs. 15%). These results suggest that depressive symptoms may mediate the link between ADHD and SI. Identifying mediating factors for SI in individuals with ADHD may help develop effective prevention strategies to reduce negative outcomes for this population.

ER Deficits: Moderator of Suicide Risk for ADHD and Depressive Symptoms

ER occurs in the context of emotion; emotion occurs in a situation, directs attention, derives meaning, and influences a multi-system response (Gross & Thompson, 2010). Thus, ER is defined herein as internal and external strategies that modulate the magnitude and/or type of emotion experienced. These strategies include attention to and appraisal of emotion, the clarity of that appraisal, the quantity and quality of coping strategies, and employing these strategies to achieve a goal. Although distinct from ER, emotional reactivity—the sensitivity, intensity, and persistence of an emotion—may predispose individuals to ER deficits (Nock, Wedig, Holmberg, & Hooley, 2008). Given that suicidal behaviors may represent an attempt to cope with emotional distress for which adaptive coping strategies are inaccessible (Baumeister, 1990), reactivity and deficits regulating emotions may link ADHD and depressive symptoms to SI.

While the literature is sparse, evidence suggests that difficulty coping with negative emotions significantly contributes to the link between ADHD and depression. Individuals with ADHD experience more distress from negative emotions and behave more impulsively when distressed. Barkley and Fischer (2010) found that young adults with persistent ADHD were more likely to report being impatient, quick tempered, frustrated, and emotionally over-reactive than controls. The few studies that have evaluated ER deficits for adults with ADHD also indicate that ADHD is associated with less effective management of emotional distress (Marx et al., 2011), difficulties with identifying and

accepting emotions, as well as difficulties acting with self-control (Edel et al., 2010). Negative emotionality has mediated the link between ADHD symptoms and the urge to act impulsively when distressed (i.e., negative urgency) for college students (Mitchell, Robertson, Anastopolous, Nelson-Gray, & Kollins, 2012). Thus, ADHD has been linked with decreased capacity to regulate emotions in young adulthood, which has implications for suicidal thoughts and behaviors.

ER deficits are also associated with depressive symptoms and SI. In an adolescent sample, depression and SI were linked to deficits in accepting negative emotions, identifying emotions (i.e., emotional clarity), being goal-oriented, and being impulsive when distressed (Weinberg & Klonsky, 2009). Rajappa, Gallagher, and Miranda (2012) also found that not accepting negative emotions was associated with previous suicide attempts in college students. Among adolescents, deficits in emotional clarity partially mediated the link between depression and SI (Jacobson, Marrocco, Kleinman, & Gould, 2011). Understanding how ER, depression, and SI are related can guide risk assessments and treatment targets for college students with ADHD.

The Current Study: Research Questions

Research shows that ADHD confers increased risk for depression and suicide attempt. However, less research has evaluated links between ADHD and SI or ADHD, depression, and SI. We sought to fill this gap by examining the degree to which depression mediated the association between ADHD and SI. As ER deficits are associated with ADHD, depressive symptoms, and SI, we examined the degree to which ER deficits magnified risk for depression and SI for those with ADHD as well as the indirect effect of ADHD on ideation through depression. Given previous research, we predicted that depressive symptoms mediated the link between ADHD and SI and that ER deficits amplified the risk for both depression and SI for those with ADHD.

Method

Participants and Procedure

Participants were 627 college students ages 18 to 25 years ($M = 20.23$, $SD = 1.40$; 60% female) enrolled at a large, public, Southeastern university. Many students were in their first year in school (43%). Nearly half (47%) identified as European American, 12% as African American, 3% as Asian, and 3% as Latino. About 4% did not specify race/ethnicity; 31% identified as multi-racial. Moreover, 14% of participants had a childhood household income of <US\$40,000/year, compared with 48% of participants with a childhood

household income of >US\$100,000/year. About 41% of mothers of participants had taken some college courses. Recruited via announcements in undergraduate psychology courses, participants completed an online survey in one sitting. Items with similar content showed no significant inconsistencies when compared. Participants received extra course credit; the university Institutional Review Board approved all procedures.

Measures

The Current Symptoms Scale–Self-Report Form (CSS). The 36 self-reported items on the CSS (Barkley, Murphy, & Fischer, 2008) have a 4-point scale (0 = *never or rarely* to 3 = *very often*) and correspond to the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.; *DSM-IV-TR*; American Psychiatric Association [APA], 2000) criteria for ADHD. Eighteen items asked about current symptoms, and eighteen items assessed childhood symptoms. Validity concerns about retrospective self-report (Mannuzza, 1993) led us to use only current symptoms. Items were summed for a total scale score, given the multicollinearity between inattention and hyperactivity ($r = .78, p < .05$). Reliability for this sample was strong ($\alpha = .92$). Self-report is correlated with parent and spousal report (Barkley et al., 2008). The CSS is often used to identify diagnostic levels of ADHD symptoms in research and clinical practice (e.g., Covey, Manubay, Jiang, Nortick, & Palumbo, 2008).

Research with a normative sample indicates that a CSS total score ≥ 27.8 is the clinical cutoff for ADHD for those 17 to 29 years old (Barkley et al., 2008). Analyses included ADHD as a dichotomous variable with 0 for symptoms below the diagnostic cutoff and 1 for those above the cutoff, who are referred to as having ADHD in this study. Childhood and current ADHD symptoms were highly correlated ($r = .63, p < .001$); rates of diagnosis were comparable between childhood and current ADHD symptoms.

Emotion Regulation Difficulties Scale (DERS). The 36 items assessed emotion regulation across six domains: non-acceptance of negative emotions (6 items; $\alpha = .90$; e.g., “When I’m upset, I become angry with myself for feeling that way”), inability to engage in goal-directed behaviors when distressed (5 items; $\alpha = .87$; e.g., “When I’m upset, I have difficulty focusing on other things”), difficulties controlling impulsive behaviors when distressed (6 items; $\alpha = .85$; e.g., “When I’m upset, I become out of control”), limited access to effective ER strategies (8 items; $\alpha = .90$; e.g., “When I’m upset, I believe that there is nothing I can do to make myself feel better”), lack of emotional awareness (6 items; $\alpha = .84$; e.g., “When I’m upset, I acknowledge my emotions”), and lack of emotional clarity (5 items; $\alpha = .83$; e.g., “I have difficulty making sense out of my feelings”). The response

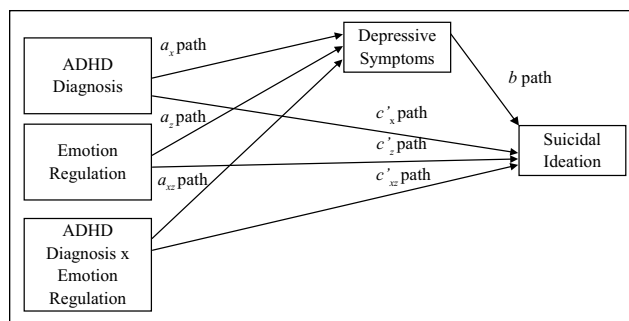


Figure 1. Conceptual moderated mediation model.

scale had five options from *almost never* to *almost always*. The DERS has acceptable validity (Gratz & Roemer, 2004).

Brief Symptoms Inventory (BSI). The 53 self-reported items on the BSI (Derogatis & Coons, 1993) measure constructs related to psychological adjustment using a 5-point scale (1 = *almost never* to 5 = *almost always*). Analyses included only the depressive symptoms subscale (6 items), which includes one item that assesses SI. We excluded that item to reduce collinearity between depressive symptoms and SI. Reliability for this scale without the SI item was strong ($\alpha = .89$) with responses ranging from 6 to 29. The depression subscale has strong construct validity (Schwannauer & Chetwynd, 2007) and discriminates between those with and without MDD (Johnson, Chipp, Brems, & Neal, 2008).

SI was assessed on the BSI with one question (“How often do you have thoughts of ending your life?”). The item displayed significant positive skew and responses ranged from 1 to 4. Thus, we recoded the item so that responses of “sometimes” or above were rated as a 1 (“yes”) and a response of “almost never” was coded as 0 (“no”).

Analytic Procedures

Model description. *Mplus* v.7.1 (Muthén & Muthén, 2010) was used for mediation analyses; *SPSS* v.19 (IBM Company, 2010) was used for remaining analyses. We estimated a moderated mediation model to test the degree to which depressive symptoms mediated the associations among ADHD diagnosis and SI and the degree to which ER moderated the association ADHD diagnosis had with depressive symptoms and SI, including the indirect and direct effect of ADHD diagnosis on SI (see Figure 1). Using path analysis in a structure equation model framework, multiple regression analyses were simultaneously generated for all paths of the mediation model. Analyses evaluated the effects of ADHD diagnosis, ER, and their interaction on depressive symptoms (path a), the effect of depressive symptoms on SI (path b), and the direct effects of ADHD diagnosis, ER, and their interaction on SI (path c'). The effect of ADHD

Table 1. Descriptive Statistics and Correlations Among Continuous Variables.

	1	2	3	4	5	6	7	8	9
1. Depressive symptoms	1								
2. Non-acceptance	.559**	1							
3. Goal-directed behavior	.379**	.429**	1						
4. Awareness	.286**	.255**	.068	1					
5. Emotional clarity	.481**	.472**	.320**	.572**	1				
6. Strategies	.662**	.648**	.590**	.286**	.530**	1			
7. Emotional impulsiveness	.515**	.509**	.493**	.303**	.507**	.723**	1		
8. Mother's education	.085**	.046	-.025	.010	.033	.047	.055	1	
9. Household income	-.081*	.044	-.020	.010	-.004	-.077	-.022	-.314**	1
M	9.69	2.06	2.82	2.39	2.17	1.97	1.83	5.21	2.43
SD	4.27	.89	.95	.86	.78	.83	.76	2.14	1.09
Skew	1.57	1.06	.53	.73	1.00	1.15	1.26	.67	-.22
Kurtosis	2.07	.89	-.30	.33	.50	1.08	1.34	.52	-1.08

Note. $N = 654$; for variable response scales, see the "Method" section.

* $p < .05$. ** $p < .01$.

diagnosis was first evaluated without ER constructs included in the mediation model. Given the strong association among ER subscales, the moderation of ER subscales was considered in independent models for a total of seven models. To aid interpretation and reduce multicollinearity, all variables were mean centered (Cohen, Cohen, West, & Aiken, 2003).

The model was tested using weighted least squares, means and variance adjusted chi-square (WLSMV) estimation, which provides robust estimation of standard errors for path coefficients using a probit link when the outcome variable is discrete (Asparouhov, 2005). Coefficients where SI was the outcome (path b and the indirect and direct effects) were probit regression estimates. Probit estimates represent the amount of z -score change in the outcome for every one unit change in the predictor. The indirect effect represents the product of a and b paths. Because the indirect effect (ab) is not likely to come from a normal distribution (MacKinnon, 2008), significance of the indirect effect was tested with bootstrapping using 5,000 generated samples, where 95% confidence intervals represented the range of the point estimates (Preacher & Hayes, 2008). Confidence intervals that do not include zero denote a significant indirect effect. Models were fully saturated, so fit statistics were not applicable.

Significant mediation would be indicated if the indirect effect of ADHD, ER, or the interaction of ADHD and ER reached statistical significance where bootstrapped confidence intervals did not include zero. Moderated mediation would be indicated only if the bootstrapped confidence intervals for the interaction of ADHD and ER did not include zero. This model also assessed the possibility that ER constructs may moderate the effect of ADHD diagnosis on depression symptoms (a_{xz} path) and on SI (c'_{ax} path or direct effect).

Covariates. Covariates were selected based on research demonstrating their association with the mediator and outcome variables and based on associations among variables in these data. Covariates were participant sex (0 = "male"; 1 = "female"), race/ethnicity (0 = "European American"; 1 = "non-European American"), mother's education, and household income.

Missing data. Only 4.4% of data were missing, which corresponded to 29 participants who chose not to disclose their race/ethnicity. Variables included in the study were not significantly different based on missingness, demonstrating that missing data were sufficiently missing at random (MAR). Missing data were managed in *Mplus* v.7.1 (Muthén & Muthén, 2010) with full information maximum likelihood (FIML), which generates accurate parameter estimates and standard errors when data are MAR.

Results

Descriptive Statistics

Descriptive statistics and correlations were assessed for continuous variables (see Table 1). Sixty-one participants (9.3%) had ADHD symptoms above the clinical cut-point, which is higher than prevalence rates of ADHD found in other studies with college students (2%-8%; see DuPaul, Weyandt, O'Dell, & Varejao, 2009). About 12% of participants reported thinking about ending their life "sometimes" or more often, which corresponds to prevalence rates of college student SI in other studies (12%; Wilcox et al., 2010). Although depressive symptoms and Emotional Impulsiveness were positively skewed, results did not differ in statistical significance or effect size based on log-transformed depressive symptoms

Table 2. Indirect and Total Effects of ADHD and Emotion Regulation on Suicidal Ideation.

	ADHD diagnosis					Emotion regulation construct					ADHD × Emotion regulation construct			
	Probit B	Probit β	LCL	UCL	PM	Probit B	Probit β	LCL	UCL	PM	Probit B	Probit β	LCL	UCL
ADHD diagnosis														
Indirect effect	.216*	.212	.148	.275	.548									
Total effect	.394*	.386	.114	.566	—									
Non-acceptance														
Indirect effect	.081*	.08	.023	.140	.310	.325*	.281	.248	.416	.769	.210*	.062	.031	.415
Total effect	.261*	.256	.046	.468	—	.423*	.366	.292	.553	—	.078	.023	-.321	.457
Emotional awareness														
Indirect effect	.195*	.191	.118	.268	.491	.128*	.104	.060	.198	.424	-.298*	-.082	-.534	-.079
Total effect	.397*	.389	.151	.602	—	.302*	.246	.136	.472	—	-.824*	-.227	-1.701	-.296
Goal-directed behavior														
Indirect effect	.119*	.117	.038	.198	.320	.231*	.064	.158	.309	—	.424*	.117	.164	.676
Total effect	.372*	.365	.134	.609	—	.069	.213	-.099	.222	—	.008	.002	-.545	.493
Emotional clarity														
Indirect effect	.090*	.088	.026	.159	.369	.313*	.233	.233	.406	.651	.124	.034	-.089	.340
Total effect	.244*	.240	.022	.464	—	.481*	.358	.289	.657	—	.056	.015	-.375	.408
Strategies														
Indirect effect	.035	.034	-.032	.095	.154	.465*	.369	.363	.578	.901	.116	.036	-.040	.275
Total effect	.228	.224	-.003	.446	—	.516*	.410	.368	.671	—	-.047	-.014	-.414	.262
Emotional impulsiveness														
Indirect effect	.087	.085	-.016	.171	.307	.346*	.253	.251	.455	.754	-.024	-.008	-.330	.185
Total effect	.283*	.277	.003	.549	—	.459*	.335	.264	.667	—	-.287	-.092	-.997	.057

Note. B = unstandardized probit coefficients; β = standardized probit coefficients. LCL and UCL were calculated with 5,000 bootstrapped samples (MacKinnon, 2008). Proportion mediated was calculated by dividing the indirect effect by the total effect. When indirect and direct effects have opposite signs, proportion mediated cannot be calculated for total effects. LCL = lower confidence limits; UCL = upper confidence limits; PM = proportion mediated.

*Indicates indirect and direct effects with LCL and UCL that do not include zero, indicating statistically significant effects.

and Emotional Impulsiveness; thus, we chose to report results with non-transformed variables.

SI occurred more frequently for participants with clinical levels of ADHD symptoms. Twenty participants with ADHD reported SI (32.3%), compared with 62 participants without ADHD (10.5%). Those with ADHD were 3.08 times more likely to report SI than those without ADHD ($\chi^2 = 24.29, p < .001$). Men were 1.89 times more likely to report SI than women, with 18.7% of men reporting SI, compared with 9.9% of women ($\chi^2 = 9.79, p < .002$). Rates of ADHD diagnosis and SI did not differ according to household income or maternal education. *t*-test analyses indicated that those with ADHD symptoms and those who reported SI had significantly higher scores on ER constructs and depressive symptoms.

Depressive symptoms were positively associated with ER constructs with effect sizes ranging from small to large. All associations among ER constructs were significant and positive with effect sizes ranging from very small to large. The wide range of effect sizes for the association of ER constructs with depressive symptoms suggests that ER constructs may play different roles in the links between ADHD and SI as well as depression and SI. Thus,

evaluating the role of each ER construct rather than the total score may provide meaningful findings. Furthermore, the significant collinearity among ER constructs supports evaluating the moderating effect of ER subscales in independent models.

Mediation Results

ADHD diagnosis. A mediation model with ADHD diagnosis and no ER constructs was evaluated to identify the independent effect of ADHD diagnosis in the model. Depressive symptoms significantly mediated the link between ADHD and SI (see Table 2), as indicated by confidence intervals that did not include zero. The direct and total effects of ADHD on SI were both positive and significant as was the association between ADHD and depressive symptoms (see Tables 3 and 2, respectively). The total effect represents the combined effect of the indirect and direct effect of ADHD on SI. The probit threshold or intercept for SI of 1.178 (see Table 3) can be interpreted as a *z*-score value and transformed into a probability, which in this case represents the probability of SI when all parameters are at their mean ($p = .881$). Using probit values for the direct effect and indirect

Table 3. Path Coefficients for Mediation Models.

	Path a: Depressive symptoms					Path c': Ideation					
	B	β	SE	LCL	UCL	Probit B	p	Probit β	SE	LCL	UCL
Model I: ADHD diagnosis											
ADHD diagnosis	1.461**	.349	.257	.930	1.953	.178*		.174	.090	-.007	.347
Path b: Depressive symptoms	—	—	—	—	—	.148**		.608	.013	.124	.174
Ideation threshold	—	—	—	—	—	1.178**	.881	1.143	.058	1.079	1.307
Model II: Non-Acceptance											
ADHD diagnosis	.586**	.140	.220	.160	1.028	.180		.177	.098	-.014	.365
Non-Acceptance	2.345**	.493	.212	1.938	2.768	.098		.085	.063	-.027	.218
ADHD \times Non-Acceptance	1.519*	.108	.677	.230	2.896	-.133		-.039	.192	-.522	.231
Path b: Depressive symptoms	—	—	—	—	—	.139**		.569	.014	.114	.167
Ideation Threshold	—	—	—	—	—	1.173**	.879	1.138	.059	1.073	1.306
Model III: Emotional awareness											
ADHD diagnosis	1.432**	.342	.307	.804	2.019	.202		.198	.110	-.034	.400
Emotional awareness	.935**	.186	.237	.459	1.377	.175*		.142	.074	.035	.322
ADHD \times Emotional awareness	-2.182*	-.146	.856	-3.944	-5.76	-.526		-.145	.312	-1.308	-.051
Path b: Depressive symptoms	—	—	—	—	—	.136**		.560	.013	.112	.163
Ideation threshold	—	—	—	—	—	1.148**	.873	1.114	.058	1.048	1.278
Model IV: Goal-directed behavior											
ADHD diagnosis	.733**	.175	.265	.219	1.250	.253*		.248	.103	.059	.459
Goal-directed behavior	1.420**	.319	.207	1.010	1.824	-.162*		-.150	.068	-.299	-.033
ADHD \times Goal-directed behavior	2.607**	.175	.758	1.035	4.010	-.416*		-.115	.209	-.870	-.043
Path b: Depressive symptoms	—	—	—	—	—	.163**		.668	.012	.140	.188
Ideation threshold	—	—	—	—	—	1.58**	.943	1.123	.058	1.059	1.287
Model V: Emotional clarity											
ADHD diagnosis	.661**	.158	.256	.184	1.182	.155		.151	.104	-.047	.355
Emotional clarity	2.301**	.417	.243	1.829	2.782	.168		.125	.090	-.015	.337
ADHD \times Emotional clarity	.914	.060	.777	-.675	2.480	-.069		-.018	.174	-.441	.242
Path b: Depressive Symptoms	—	—	—	—	—	.136**		.559	.013	.112	.163
Ideation threshold	—	—	—	—	—	1.173**	.879	1.138	.059	1.074	1.306
Model VI: Strategies											
ADHD diagnosis	.245	.059	.229	-.219	.679	.193		.189	.103	-.011	.184
Strategies	3.246	.627*	.222	2.811	3.677	.052		.041	.082	-.111	.212
ADHD \times Strategies	.811	.061	.540	-.281	1.831	-.163		-.051	.187	-.553	.391
Path b: Depressive symptoms	—	—	—	—	—	.143**		.588	.014	.118	.171
Ideation threshold	—	—	—	—	—	1.168**	.877	1.133	.059	1.067	1.299
Model VII: Emotional impulsiveness											
ADHD diagnosis	.615	.147	.345	-.110	1.261	.197		.193	.013	-.032	.433
Emotional impulsiveness	2.459**	.437	.287	1.916	5.047	.113		.082	.118	-.065	.299
ADHD \times Emotional impulsiveness	-.173	-.013	.767	-1.787	1.257	-.263		-.084	.092	-.680	.062
Path b: Depressive symptoms	—	—	—	—	—	.141**		.578	.190	.116	.167
Ideation threshold	—	—	—	—	—	1.159**	.876	1.124	.060	1.053	1.290

Note. SEs apply to the unstandardized coefficients. LCL and UCL were calculated with bootstrapping (MacKinnon, 2008). The c' path is the direct effect. The threshold or intercept can be interpreted as a z-score for risk of ideation when all independent variables are at zero. This value can be transformed into a probability score based on the z-score. Probit coefficients represent the z-score change in the threshold for one unit change in the predictor. The threshold can also be used to interpret the indirect and total effects. B = unstandardized probit coefficients and β = standardized probit coefficients.; SE = Standard Error; LCL = lower confidence limits; UCL = upper confidence limits.

* $p < .05$. ** $p < .01$.

effect, ADHD directly increases risk for SI above the threshold value by .178 z-score units and indirectly by .216 z-score units.

We then evaluated the role of ER by including in separate models each ER construct as a moderator of the link between ADHD and SI as well as ADHD and depressive

symptoms. Results demonstrated that depressive symptoms mediated the association between ADHD and SI in all models except for models including Strategies and Emotional Impulsiveness as moderators (see Table 2). Strategies and Emotional Impulsiveness were strongly related to depressive symptoms allowing for little additional variance to be accounted for by other variables. The direct effect of ADHD on SI (c' path) was positive and significant only in the model with Goal-Directed Behavior (see Table 3). The total effect of ADHD was similarly positive and statistically significant for all models except for the model with Strategies (Table 2).

Non-Acceptance. ADHD interacted with Non-Acceptance to indirectly affect SI (see Table 2), where confidence intervals did not include zero. The direct and total effects of the interaction term were not significant (Tables 3 and 2, respectively). The interaction of Non-Acceptance and ADHD was significantly associated with increased depressive symptoms, which significantly increased the risk of SI. According to simple slope evaluation, problems with accepting negative emotions were higher at diagnostic levels of ADHD symptoms, which corresponded to increased depressive symptoms and indirectly increased risk for SI (see Table 4; Figure 2). Interpreting the probit threshold (intercept) for SI of 1.173 (see Table 3) as a z -score indicates that the probability of SI when all parameters are at their mean was .879. Simple slope results indicated that at diagnostic levels of ADHD, one unit increase in problems with Non-Acceptance indirectly increased risk for SI by .269 z -score units above the SI threshold.

Independent of ADHD, the indirect and total effects of Non-Acceptance on SI were positive and significant. Every one unit increase in Non-Acceptance indirectly increased the risk of SI by .325 z -score units above the SI threshold through the effects of depressive symptoms. The positive association between Non-Acceptance and depression indicated that, independent of ADHD, depressive symptoms increased as problems accepting negative emotions increased.

Emotional Awareness. ADHD interacted with Emotional Awareness to indirectly affect SI (see Table 2), indicated by bootstrapped confidence intervals not including zero. Evaluating the simple slopes (see Table 4) indicated that participants with ADHD and fewer problems being aware of negative emotions (i.e., low Emotional Awareness deficits) had the highest depressive symptoms; but, for participants without ADHD, problems with emotional awareness (i.e., high Emotional Awareness deficits) were associated with increased depressive symptoms (see Figure 2). For participants with ADHD, each unit increase in Emotion Awareness indirectly increased the risk for SI by .183 z -score units above the threshold for SI (probit $B = 1.148$).

Emotional Awareness demonstrated significant and positive indirect and direct effects on SI and a significant and positive association with depressive symptoms independent of ADHD. The main effect of Emotional Awareness indicated that depressive symptoms increased when difficulty being aware of negative emotions increased, which indirectly increased risk for SI by .128 z -score units above the SI threshold of 1.148. Similarly, increases in Emotional Awareness directly corresponded to a .175 z -score unit increase above the SI threshold.

Goal-Directed Behavior. ADHD interacted with Goal-Directed Behavior to indirectly and directly affect SI (see Tables 2 and 3). The interaction was significantly associated with increasing depressive symptoms, which significantly increased the risk of SI (see Table 3). For participants with ADHD, difficulty being goal-oriented when distressed (i.e., higher Goal-Directed Behavior deficits) was associated with increased depressive symptoms, which indirectly increased risk for SI by .521 z -score units above the SI threshold (probit $B = 1.58$; see Table 4 and Figure 2). However, the direct effect of the interaction had the opposite effect. When ADHD was not present, fewer problems with being goal-oriented when distressed (i.e., low Goal-Directed Behavior deficits) was associated with risk for SI (see Figure 3). That is, problems engaging in goal-directed behavior for those without ADHD directly decreased risk for SI by .140 z -score units below the SI threshold.

The indirect effect of Goal-Directed Behavior on SI independent of ADHD was also positive, but the direct effect was negative. Depressive symptoms increased as difficulty engaging in goal-directed behavior increased, which led to increased SI risk, but difficulty with goal-directed behavior decreased SI risk by .162 z -score units below the SI threshold.

Emotional clarity. Only the indirect and total effects of Emotional Clarity on SI were positive and significant (see Table 2). As problems with Emotional Clarity increased, depressive symptoms increased. Thus, Emotional Clarity indirectly increased risk for SI .313 z -score units above the SI threshold (probit $B = 1.173$).

Strategies. The indirect and total effects of Strategies on SI were significant (Table 2). As problems creating strategies to cope with distress increased, depressive symptoms increased. As a result, Strategies increased SI risk .465 z -score units above the SI threshold (probit $B = 1.168$).

Emotional impulsiveness. Only the indirect and total effects of Emotional Impulsiveness on SI were significant (see Table 2). As problems being impulsive when distressed increased, depressive symptoms increased. Thus, Emotional Impulsiveness indirectly increased risk for SI .465 z -score units above the SI threshold (probit $B = 1.159$).

Table 4. Simple Effects for the Interactions of ADHD and Emotion Regulation.

	B	SE	Probit B	SE	Probit B	SE	z-score	p value
Path a: ADHD × Non-Acceptance to depressive symptoms			Path b: Depressive symptoms to ideation		Indirect effect (Path ab): ADHD × Non-acceptance			
High ADHD	1.935	.088	.139	.015	.269	.017	16.026	< .001
Low ADHD	-.763	.008	.139	.015	-.106	.029	-3.651	< .001
Path a: ADHD × Emotional awareness to depressive symptoms			Path b: Depressive symptoms to ideation		Indirect effect (Path ab): ADHD × emotional awareness			
High ADHD	1.345	.145	.136	.013	.183	.026	6.953	< .001
Low ADHD	-2.561	.044	.136	.013	-.348	.034	-10.297	< .001
Path a: ADHD × Goal-directed behavior to depressive symptoms			Path b: Depressive symptoms to ideation		Indirect effect (Path ab): ADHD × Goal-directed behavior			
High ADHD	3.194	.111	.163	.012	.521	.027	18.942	<.001
Low ADHD	-1.728	.030	.163	.012	-.282	.039	-7.291	<.001
					Direct effect (Path c): ADHD × Goal-directed behavior			
High ADHD	-	-	-	-	-.140	.015	-9.330	<.001
Low ADHD	-	-	-	-	.646	.006	103.413	<.001

Note. B = unstandardized coefficients; Standard error for simple effects of the indirect effect used the following equation: $\sqrt{(b^2 \times s_e^2 + a^2 \times s_b^2)}$. High ADHD: ADHD symptoms above the diagnostic cutoff; Low ADHD: ADHD symptoms below the diagnostic cutoff. See Figures 1-3 for a visual representation of the interaction of ADHD and ER subscales on depressive symptoms and ideation. SE = Standard Error; ER = emotion regulation.

Effect size. According to MacKinnon (2008), the proportion mediated indicates how the size of the indirect effect compares to the total effect and is calculated by dividing the indirect effect by the total effect. Given that the proportion mediated is not necessarily bounded by zero, caution is suggested in interpreting it as a strict proportion ranging from 0 to 1.0 (Preacher & Kelley, 2011). The proportion that depressive symptoms mediated of the association between ADHD and SI ranged from .154 to .491 ($M = .332$, $SD = .101$) across models. These results indicate that on average depressive symptoms mediated approximately 33.2% of the variance in the total effect of ADHD on risk for SI. Depressive symptoms mediated 76.9% of the association between Non-Acceptance and SI, 42.4% of the association between Emotional Awareness and SI, 65.1% of the association between Emotional Clarity and SI, 90.1% of the association between Strategies and SI, and 75.4% of the association between Emotional Impulsiveness and SI. Given the negative direct effects and positive indirect effect, it was not possible to calculate the proportion mediated for Goal-Directed Behavior. Standardized regression coefficients can also serve as effect sizes for path coefficients and indicate change in the outcome variable for every one standard deviation change in the predictor (MacKinnon, 2008; see Tables 2 and 3).

Additional analyses. To evaluate the assumption of mediation that the mediator is not better characterized as a moderator (VanderWeele & Vansteelandt, 2010), we analyzed alternate

models that included the interaction of ER and depressive symptoms as well as ADHD and depressive symptoms for each ER subscale. Depressive symptoms did not function as a significant moderator of the link between ADHD and SI or any of the ER subscales and SI. Thus, we reported models without the interaction between independent variables and the mediator.

Discussion

The goals of this study were twofold. First, we evaluated the mediating role of depressive symptoms in the association between ADHD and SI. Second, we identified the degree to which ER moderated the association between ADHD and depressive symptoms as well as the direct and indirect effect of ADHD on SI. A unique contribution of this study is its evaluation of the role of both depression and ER in the association between ADHD and SI. ADHD diagnosis has been associated with suicide attempts (e.g., Chronis-Tuscano et al., 2010) and to a lesser extent, SI (Barkley & Fischer, 2005). Our findings suggest that depressive symptoms may be a possible mechanism for the association between ADHD and SI. Although SI is a *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; DSM-IV; APA, 1994) criterion for MDD, and depression increases the risk for SI (Nock et al., 2013), many individuals who think about suicide do not endorse depressive symptoms (Borges et al., 2010), and are not depressed at the time of their death by suicide (Arsenault-Lapierre, Kim, & Turecki,

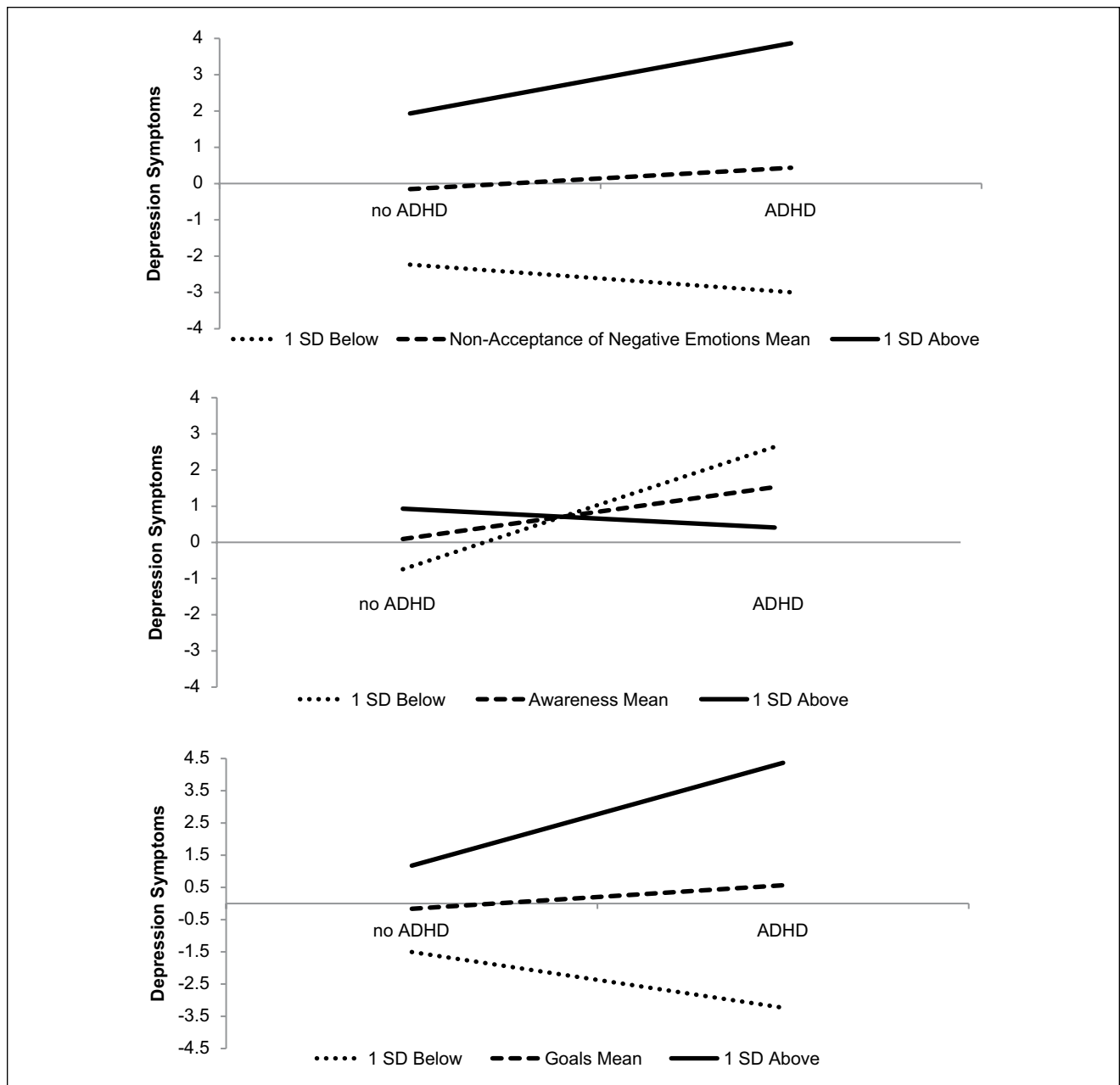


Figure 2. Interactions of emotion regulation constructs and ADHD predicting depressive symptoms.

2004). Thus, results suggest that depression in the context of ADHD may place individuals at particularly high risk for SI. Further work can evaluate whether findings extend to suicide attempts, death, and non-suicidal self-injury for those with ADHD.

Deficits in ER were directly related to change in SI, indirectly increased risk for SI through depressive symptoms, and moderated the indirect effect of ADHD on SI through depressive symptoms. Taken together, findings highlight the unique function of ER in ADHD, depression, and suicide risk. Because ER strategies can be learned, findings

draw attention to potential avenues and modifiable risk factors for intervention.

One of the most surprising findings was the moderating role of goal-directed behavior in ADHD, depression, and SI. For individuals with ADHD, difficulty engaging in goal-directed behavior when distressed was associated with increased depression, which was then associated with increased SI. It is possible that difficulties engaging in goal-directed behavior can lead to increased frustration and/or negative self-cognitions, which are then associated with depressive symptoms (Mitchell, Benson, Knouse, Kimbrel,

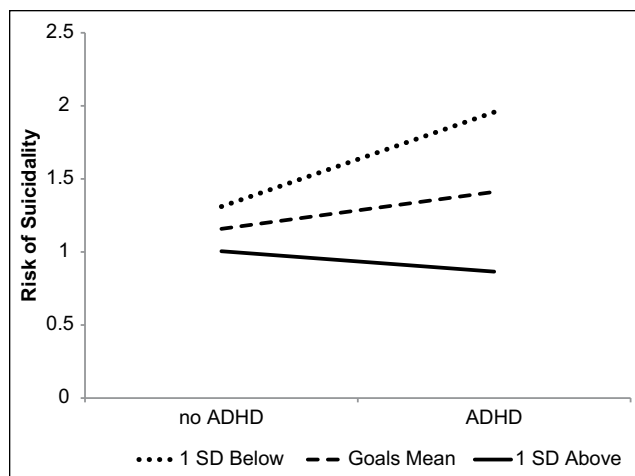


Figure 3. Interaction of lack of Goal-Directed Behavior and ADHD predicting suicidal ideation.

& Anastopolous, 2013). However, goal-oriented behavior moderated the direct effect of ADHD on SI, indicating that when those with ADHD experience more difficulty with goal-directed behavior, risk for SI decreases. Together, these findings suggest that in the context of depressive symptoms, difficulty with goal-directed behavior may increase SI risk. However, independent of depressive symptoms, problems with goal-directed behavior may be protective for individuals with ADHD in the context of SI. In general, individuals with ADHD have difficulty persisting with tasks when upset (Walcott & Landau, 2004), which has negative outcomes for schoolwork and coping strategies. However, struggling to persist when upset could be protective for SI, above and beyond the influence of depression on SI.

ADHD also interacted with awareness of emotions. For individuals without ADHD, difficulty with emotional awareness was associated with increased depressive symptoms and SI. For those with ADHD, difficulty with emotional awareness was associated with decreased depressive symptoms and SI, suggesting that increased emotional awareness was positively associated with depression and SI. Research on children, adolescents, and adults with ADHD has described the positive illusory bias, in which individuals with ADHD tend to over-report their competency, even in the presence of contradictory evidence (Owens, & Hoza, 2003, Prevatt, Proctor, Best, Baker, & Taylor, 2012). One possible function of the positive illusory bias is self-protection from negative emotions associated with failure (Hoza et al., 2010), which may be reduced in individuals with co-morbid depression (Owens & Hoza, 2003). Lack of awareness of negative emotions may have served a similar purpose to the positive illusory bias in this sample and may be protective for depressive symptoms, decreasing SI. Further investigation with young adults with ADHD is warranted. In addition, clinicians working to

increase emotional awareness in patients with ADHD may benefit from carefully monitoring depressive symptoms and SI.

Non-acceptance of negative emotions targets frustration, guilt, and shame associated with experiencing intense negative emotions. Results indicated that those with ADHD and high non-acceptance of negative emotions had higher levels of depressive symptoms, leading to increased SI. Although difficulty accepting emotions has been associated with alexithymia—deficits in identifying and expressing emotional experience—in adults with ADHD (Edel et al., 2010), little research has linked non-acceptance of negative emotions to ADHD. While further investigation is needed, interventions that incorporate a non-judgmental stance on emotions or mindfulness (i.e., Acceptance and Commitment Therapy or DBT; Hayes, Luoma, Bond, Masuda, & Lillis, 2006; Linehan, 1993) may be effective with individuals with both ADHD and depression.

Emotional impulsivity, separate from ADHD diagnostic criteria, has been proposed as an important variable in the symptom persistence and impairment associated with ADHD (Barkley & Fischer, 2010). Although we found a main effect of emotional impulsiveness on depressive symptoms and SI, it did not function as a moderator. Instead, trait impulsiveness may impact depression and SI for those with ADHD rather than impulsiveness specific to emotional distress.

Problems with emotional coping strategies and emotional clarity did not interact with ADHD to predict depressive symptoms or SI, although they were independently associated with increases in both. Although these results underscore the importance of teaching coping skills and psycho-education around emotions in the treatment of depression, these deficits do not appear more problematic for those with ADHD than those without ADHD.

Limitations

Results are tempered by study limitations. Our sample was cross-sectional, which limits the evaluation of directional associations (MacKinnon, 2008; Maxwell & Cole, 2007). Very limited research has evaluated the role of ER deficits in the association between ADHD and depression, and no research has evaluated its role in the link between ADHD and SI. Thus, cross-sectional analyses provide an opportunity to consider a potentially important explanation for SI and its association with ADHD. However, this study should be replicated with longitudinal data to clarify the implied causal associations. Also, assessing a wider array of suicidal behavior and using methods that expand beyond self-report would clarify findings. Although multi-informant assessment is preferred, evidence suggests that self-report provides valid and reliable assessment of ADHD, depression, and suicidal behavior (Barkley et al., 2008; Kooij et al., 2008).

Summary and Conclusion

In sum, results indicated that specific ER deficits moderated the link between ADHD and depression and the indirect effect of ADHD on SI through depression. Findings suggest that individuals with ADHD may benefit from treatment that includes building effective ER competencies.

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References

- American College Health Association. (2009). *National College Health Assessment II* (Reference Group Executive Summary). Baltimore, MD: Author.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). Washington, DC: Author.
- Angold, A., Costello, E. J., & Erkanli, A. (1999). Comorbidity. *Journal of Child Psychology and Psychiatry*, *40*, 57-87.
- Arsenault-Lapierre, G., Kim, C., & Turecki, G. (2004). Psychiatric diagnoses in 3275 suicides: A meta-analysis. *Bio Med Central Psychiatry*, *4* (November), Article 37.
- Asparouhov, T. (2005). Sampling weights in latent variable modeling. *Structural Equation Modeling*, *12*, 411-434.
- Barkley, R. A., & Fischer, M. (2005). Suicidality in children with ADHD, grown up (Special Issue—Focus on Assessment). *The ADHD Report*, *13*(6), 1-6.
- Barkley, R. A., & Fischer, M. (2010). The unique contribution of emotional impulsiveness to impairment in major life activities in hyperactive children as adults. *Journal of the American Academy of Child & Adolescent Psychiatry*, *49*, 503-513.
- Barkley, R. A., Murphy, K. R., & Fischer, M. (2008). *ADHD in adults: What the science says*. New York, NY: Guilford Press.
- Baumeister, R. F. (1990). Suicide as escape from self. *Psychological Review*, *97*, 90-113.
- Biederman, J., Petty, C., Evans, M., Small, J., & Faraone, S. (2010). How persistent is ADHD? A controlled 10-year follow-up study of ADHD. *Psychiatry Research*, *177*, 299-304.
- Borges, G., Nock, M. K., Abad, J. M. H., Hwang, I., Sampson, N. A., Alonso, J., . . . Kessler, R. C. (2010). Twelve-month prevalence of and risk factors for suicide attempts in the WHO World Mental Health Surveys. *Journal of Clinical Psychiatry*, *71*, 1617-1628.
- Cavanagh, J. T. O., Carson, A. J., Sharpe, M., & Lawrie, S. M. (2003). Psychological autopsy studies of suicide: A systematic review. *Psychological Medicine*, *33*, 395-405.
- Centers for Disease Control and Prevention. (2011). *WISQARS fatal injury reports*. Retrieved from http://www.cdc.gov/injury/wisqars/fatal_injury_reports.html
- Chronis-Tuscano, A., Molina, B. S., Pelham, W. E., Applegate, B., Dahlke, A., Overmyer, M., & Lahey, B. B. (2010). Very early predictors of adolescent depression and suicide attempts in children with ADHD. *Archives of General Psychiatry*, *67*, 1044-1051.
- Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). Mahwah, NJ: Lawrence Erlbaum.
- Covey, L., Manubay, J., Jiang, H., Nortick, M., & Palumbo, D. (2008). Smoking cessation and inattention or hyperactivity/impulsivity: A post hoc analysis. *Nicotine & Tobacco Research*, *10*, 1717-1725.
- Derogatis, L. R., & Coons, H. L. (1993). Self-report measures of stress. In S. Breznitz & L. Goldberger (Eds.), *Handbook of stress: Theoretical and clinical aspects* (2nd ed., pp. 200-233). New York, NY: Free Press.
- DuPaul, G. J., Weyandt, L. L., O'Dell, S. M., & Varejao, M. (2009). College students with ADHD: Current status and future directions. *Journal of Attention Disorders*, *13*, 234-250.
- Edel, M. A., Rudel, A., Hubert, C., Scheele, D., Brüne, M., Juckel, G., & Assion, H. J. (2010). Alexithymia, emotion processing and social anxiety in adults with ADHD. *European Journal of Medical Research*, *15*, 403-409.
- Gratz, K. L., & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the DERS. *Journal of Psychopathology and Behavioral Assessment*, *26*, 41-54.
- Gross, J. J., & Thompson, R. A. (2010). Emotion regulation: Conceptual foundations. In J. J. Gross (Ed.), *Handbook of emotion regulation* (pp. 135-158). New York, NY: Guilford Press.
- Hayes, S. C., Luoma, J. B., Bond, F. W., Masuda, A., & Lillis, J. (2006). ACT: Model, processes and outcomes. *Behaviour Research and Therapy*, *44*, 1-25.
- Hinshaw, S., Owens, E., Zalecki, C., Huggins, S., Montenegro-Nevado, A., . . . Swanson, E. (2012). Prospective follow-up of girls with ADHD into early adulthood. *Journal of Consulting and Clinical Psychology*, *80*, 1041-1051.
- Hoza, B., Murray-Close, D., Arnold, E. L., Hinshaw, S. P., Hechtman, L., & MTA Cooperative Group. (2010). Time-dependent changes in positively biased self-perceptions of children with ADHD. *Developmental Psychopathology*, *22*, 375-390.
- Jacobson, C. M., Marrocco, F., Kleinman, M., & Gould, M. S. (2011). Restrictive emotionality, depressive symptoms, and suicidal thoughts and behaviors among high school students. *Journal of Youth and Adolescence*, *40*, 656-665.
- James, A., Lai, F. H., & Dahl, C. (2004). Attention deficit hyperactivity disorder and suicide: A review of possible associations. *Acta Psychiatrica Scandinavica*, *110*, 408-415.
- Johnson, M. E., Chipp, C. L., Brems, C., & Neal, D. B. (2008). Receiver operating characteristics for the Brief Symptom Inventory Depression, paranoid ideation, and psychoticism scales in a large sample of clinical inpatients. *Psychological Reports*, *102*, 695-705.

- Kooij, J., Boonstra, A., Swinkels, S., Bekker, E., de Noord, I., & Buitelaar, J. (2008). Reliability, validity, and utility of instruments for self-report and informant report concerning symptoms of ADHD in adult patients. *Journal of Attention Disorders, 11*, 445-458.
- Linehan, M. (1993). *CBT of borderline personality disorder*. New York, NY: Guilford Press.
- MacKinnon, D. P. (2008). *Introduction to statistical mediation analysis*. Mahwah, NJ: Lawrence Erlbaum.
- Mannuzza, S. (1993). Adult outcome of hyperactive boys educational achievement, occupational rank, and psychiatric status. *Archives of General Psychiatry, 50*, 565-576.
- Marx, I., Domes, G., Havenstein, C., Berger, C., Schulze, C., & Herpertz, S. C. (2011). Enhanced emotional interference on working memory performance in adults with ADHD. *The World Journal of Biological Psychiatry, 12*, 70-75.
- Maxwell, S. E., & Cole, D. A. (2007). Bias in cross-sectional analyses of longitudinal mediation. *Psychological Methods, 12*, 23-44.
- Mitchell, J., Benson, J., Knouse, L., Kimbrel, N., & Anastopolous, A. (2013). Are negative auto-matic thoughts associated with ADHD in adulthood? *Cognitive Therapy and Research, 37*, 851-859.
- Mitchell, J., Robertson, C. D., Anastopolous, A. D., Nelson-Gray, R. O., & Kollins, S. H. (2012). Emotion dysregulation and emotional impulsivity among adults with ADHD: Results of a preliminary study. *Journal of Psychopathology and Behavioral Assessment, 34*, 510-519.
- Muthén, L., & Muthén, B. (2010). *Mplus user's guide* (6th ed.). LA, CA: Muthén & Muthén.
- Nock, M. K., Green, J., Hwang, I., McLaughlin, K., Sampson, N., Zaslavsky, A., & Kessler, R. (2013). Prevalence, correlates, and treatment of lifetime suicidal behavior among adolescents: Results from the National Comorbidity Survey Replication Adolescent Supplement. *JAMA Psychiatry, 70*, 300-310.
- Nock, M. K., Wedig, M. M., Holmberg, E. B., & Hooley, J. M. (2008). The Emotion Reactivity scale: Development, evaluation, and relation to self-injurious thoughts and behaviors. *Behavior Therapy, 39*, 107-116.
- Owens, J. S., & Hoza, B. (2003). The role of inattention and hyperactivity/impulsivity in the positive illusory bias. *Journal of Consulting and Clinical Psychology, 71*, 680-691.
- Preacher, K. J., & Hayes, A. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*, 879-891.
- Preacher, K. J., & Kelley, K. (2011). Effect size measures for mediation models: Quantitative strategies for communicating indirect effects. *Psychological Methods, 16*, 93-115.
- Prevatt, F., Proctor, B., Best, L., Baker, L., & Taylor, N. (2012). The positive illusory bias: Does it explain self-evaluations in students with ADHD? *Journal of Attention Disorders, 16*, 235-243.
- Rajappa, K., Gallagher, M., & Miranda, R. (2012). Emotion dysregulation and vulnerability to suicidal ideation and attempts. *Cognitive Therapy and Research, 36*, 833-839.
- Schwannauer, M., & Chetwynd, P. (2007). The Brief Symptom Inventory: A validity study in two Scottish samples. *Clinical Psychology & Psychotherapy, 14*, 221-228.
- Seymour, K. E., Chronis-Tuscano, A., Halldorsdottir, T., Stupica, B., Owens, K., & Sacks, T. (2011). Emotion regulation mediates the relationship between ADHD and depressive symptoms in youth. *Journal of Abnormal Child Psychology, 40*, 595-606.
- VanderWeele, T. J., & Vansteelandt, S. (2010). Odds ratios for mediation analysis for a dichotomous outcome. *American Journal of Epidemiology, 172*, 1339-1348.
- Walcott, C. M., & Landau, S. (2004). The relation between disinhibition and emotion regulation in boys with ADHD. *Journal of Clinical Child & Adolescent Psychology, 33*, 772-782.
- Weinberg, A., & Klonsky, E. D. (2009). Measurement of emotion dysregulation in adolescents. *Psychological Assessment, 21*, 616-621.
- Wilcox, H. C., Arria, A. M., Caldeira, K. M., Vincent, K. B., Pinchevsky, G. M., & O'Grady, K. E. (2010). Prevalence and predictors of persistent suicide ideation, plans, and attempts during college. *Journal of Affective Disorders, 127*, 287-294.

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