How is impulsivity related to depression in adolescence? Evidence from a French validation of the cognitive emotion regulation questionnaire

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Abstract

The aim of this study was to validate a French version of the Cognitive Emotion Regulation Questionnaire (CERQ; Garnefski, N., Kraaij, V., & Spinhoven, P., 2001. Negative life events, cognitive emotion regulation and emotional problems. Personality and Individual Differences, 30, 1311–1327) and to explore its relationships with impulsivity and depression. Teenagers from a junior secondary (n = 107, 13–16 years) and a secondary school (n = 110, 15–19 years) completed the CERQ, which assesses regulation strategies in response to negative events. The secondary school adolescents also completed the UPPS Impulsive Behavior Scale (Whiteside, S. P., & Lynam, D. R., 2001. The five factor model and impulsivity: Using a structural model of personality to understand impulsivity. Personality and Individual Differences, 30, 669–689) and the Reynolds Adolescent Depression Scale (Reynolds, W. M., 1987. Reynolds Adolescent Depression Scale: Professional manual. Odessa, FL: Psychological Assessment Resources). Factor analysis for the CERQ confirmed the presence of the nine original regulation strategies. In the secondary school students, impulsivity was related to depression. A path analysis revealed that regulation

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strategies mediated this relationship. The role of emotion regulation in the development of adolescent psychopathology is discussed.

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Introduction

Emotion regulation has become an important topic for research on adolescence for several reasons. First of all, the physical and psychosocial transformations experienced during adolescence are accompanied by strong emotions (Larson & Lampman-Petraitis, 1989) and many of the neural or cognitive systems that are supposed to control emotion mature during this period (Hooper, Luciana, Conklin, & Yarger, 2004). In addition, emotion regulation is implicated in diverse forms of adolescent psychopathology, including both internalized and externalized disorders. From this perspective, Silk, Steinberg, and Morris (2003) asked adolescents to record their mood states at random times of the day. The authors found that adolescents who reported more intense and labile emotions and less effective regulation of these emotions also reported more depressive symptoms and problem behavior.

Garnefski, Kraaij, and Spinhoven (2001) developed the Cognitive Emotion Regulation Questionnaire (CERQ) to assess strategies used by teenagers in response to negative events. The CERQ evaluates the cognitive and voluntary aspects of emotion regulation, that is, the thoughts and mental strategies adolescents intentionally use to regulate their emotions. The instrument was designed to include nine separate subscales. A factor analysis at the item level supported the distinction between nine regulation strategies. Furthermore, a factor analysis to summarize the intercorrelations between subscales supported a distinction between theoretically more appropriate strategies (acceptance, positive refocusing, refocus on planning, positive reappraisal, putting into perspective) and more inappropriate strategies (self-blame, rumination, catastrophizing, blaming others). The first aim of this study was to validate a French version of the CERQ in a community sample of adolescents by means of a confirmatory analysis.

A second aim was to explore the relationships between emotion regulation, depression and impulsivity. Indeed, regulation strategies, as assessed by the CERQ, have been related to the experience of depression in adolescence (Garnefski, Legerstee, Kraaij, van den Kommer, & Teerds, 2002). Moreover, some of these strategies appear to moderate the impact of stressful events on depression (Kraaij et al., 2003). Based on these studies and others (Garnefski, Boon, & Kraaij, 2003; Garnefski et al., 2001), we hypothesized that rumination, self-blame, and catastrophizing would best predict an increase in depression whereas positive reappraisal would best predict a decrease in depression. Depression was assessed with a French translation of the Reynolds Adolescent Depression Scale (RADS; Reynolds, 1987).

Impulsivity in childhood has been related to poor anger control and aggressive behaviour (Musher-Eizenman et al., 2004). However, impulsive children and adolescents may have difficulties regulating negative emotions in general, and not only anger. Indeed, two studies have reported that impulsive adolescents are more depressed and have more suicide ideation than
their non-impulsive peers (Belloc, Leichsenring, & Chabrol, 2004; Hutchinson, Patock-Peckham, Cheong, & Nagoshi, 1998). However, we do not yet know whether impulsive adolescents are more depressed because they use inefficient emotion regulation strategies when they experience negative life events. If so, we should find that regulation strategies mediate the link between impulsivity and depression. Impulsive traits were assessed by the UPPS Impulsive Behavior Scale (UPPS Scale; Whiteside & Lynam, 2001), which was recently validated in adolescents (d’Acremont & Van der Linden, 2005). The UPPS Scale distinguishes four aspects of impulsivity: urgency, lack of premeditation, lack of perseverance, and sensation seeking.

Method

Participants

The participants were 116 students from a junior secondary school and 117 from a secondary school, both located in the French-speaking region of Switzerland. The whole sample completed the CERQ, but only the secondary school students completed the UPPS Scale and the RADS. Data for one student were removed from the analysis because of language (only native French speakers or students who had spoken French for more than 4 years were included). In order to perform the confirmatory factor analysis with no missing values, the data for 13 other subjects were removed because they had missing values on the CERQ. Two other subjects were removed because they had more than one missing value on the UPPS Scale. The missing UPPS value was replaced by the subscale mean. The final sample was made up of 107 students from the junior secondary school (57 girls and 50 boys) aged from 13 to 16 years ($M = 14.32$, $SD = .72$), and 110 students from the secondary school (71 girls and 39 boys) aged from 15 to 19 years ($M = 16.07$, $SD = .91$). The whole sample was thus composed of 217 students ($M = 15.21$ years, $SD = 1.20$).

Questionnaires

Cognitive emotion regulation questionnaire (CERQ: Garnefski et al., 2001)

The CERQ is a Dutch 36-item scale designed to evaluate nine cognitive strategies used to regulate emotions in response to negative or unpleasant events (Garnefski, Kraaij, & Spinhoven, 2002). The first strategy, Acceptance, “refers to thoughts of accepting what you have experienced and resigning yourself to what has happened” (Garnefski et al., 2001, p. 1314). Positive refocusing “refers to thinking about joyful and pleasant issues instead of thinking about the actual event.” Refocus on planning “refers to thinking about what steps to take and how to handle the negative event.” Positive reappraisal “refers to thoughts of attaching a positive meaning to the event in terms of personal growth.” Putting into perspective “refers to thoughts of playing down the seriousness of the event or emphasizing its relativity when compared to other events.” Self-blame “refers to thoughts of blaming yourself for what you have experienced.” Rumination “refers to thinking about the feeling and thoughts associated with the negative event.” Catastrophizing “refers to thoughts of explicitly emphasizing the terror of an experience.” Finally, Blaming others “refers to thoughts of putting the blame of what you have experienced on others.”

The scale was developed for adolescents (Garnefski et al., 2001). Recently, it was translated into French using a back-translation method and the nine-strategy model was confirmed in a sample of
French-speaking undergraduates, as was the distinction between theoretically more appropriate and more inappropriate strategies (Jermann, Van der Linden, d’Acremont, & Zermatten, 2006). Answers to items were given on a Likert scale ranging from “Almost never” (1) to “Almost always” (5).

Reynolds adolescent depression scale (RADS; Reynolds, 1987)

The RADS is an English 30-item scale designed to assess depression in adolescence. The RADS has been validated in adolescents (Reynolds & Mazza, 1998). A French adaptation of the scale was produced using a back-translation method (Abbiati, Freud, d’Acremont, & Van der Linden, unpublished). Answers are given on a Likert scale ranging from “Almost never” (1) to “Almost always” (4). The Cronbach alpha for the scale is .89, which indicates very good reliability (.80). This value is close to the original English validation (.91; Reynolds & Mazza, 1998). The mean score of the sample was 53.86, SD = 11.04.

UPPS Impulsive Behavior Scale (UPPS Scale; Whiteside & Lynam, 2001)

The UPPS Scale is an English 45-item questionnaire intended to assess four impulsivity traits. The first trait, Urgency, “refers to the tendency to experience strong impulses, frequently under conditions of negative affect” (Whiteside & Lynam, 2001, p. 685). The second trait, Premeditation, “refers to the tendency to think and reflect on the consequences of an act before engaging in that act.” The third trait, Perseverance, “refers to an individual’s ability to remain focused on a task that may be boring or difficult.” Finally, Sensation seeking “incorporates two aspects: (1) a tendency to enjoy and pursue activities that are exciting and (2) an openness to trying new experiences that may or may not be dangerous.”

The scale was validated in a community sample of French-speaking adolescents that included the secondary school students of the present study (d’Acremont & Van der Linden, 2005). Answers were given on a Likert scale ranging from “Disagree strongly” (1) to “Agree strongly” (4). The reliability of each subscale was very good, with Cronbach’s alpha > .80. The means (SD) for the sample were 29.15 (6.06) for urgency, 24.44 (4.71) for lack of premeditation, 20.28 (4.73) for lack of perseverance, and 34.74 (6.58) for sensation seeking.

Statistical analysis

Path and confirmatory factor analyses were computed with LISREL 8.54 (Jöreskog & Sörbom, 1996). The other analyses were done with R (R Development Core Team, 2005). The fit of the path analysis was tested with $\chi^2$ (X2). A $p$-value of X2 > .01 is considered as an acceptable fit, and > .05 as a good fit (Schermelleh-Engel & Moosbrugger, 2003). But X2 is known to increase with sample size and degree of freedom. For these reasons, the fit of the confirmatory factor analyses was tested by examining other indices that depend on a conventional cut-off. Hu and Bentler (1998) have recommended the use of two: the root mean square error of approximation (RMSEA) and the standardized root mean square residual (SRMR). An RMSEA between 0 and .05 indicates a good fit and between .05 and .08 an acceptable fit. An SRMR between 0 and .05 indicates a good fit and between .05 and .10 an acceptable fit.

Accepting or rejecting hypotheses based on $p$-value has been shown to be problematic, mainly because the $p$-value depends on both effect size and sample size. Following the recommendation of several authors (e.g. Schmidt, 1996), effect sizes were reported within their 95% confidence
Results

Confirmatory factor analysis of the CERQ

Results for a nine-factor CFA showed the following fit indices: $X^2(558) = 928.69, p < .01$, RMSEA = .052, 90% CI = (.046, .059), and SRMR = .076. These fit indices suggested that the model is acceptable. Standardized loadings were all $>.30$, except for item 20, which loaded at .17 on Acceptance. Loadings greater than .30 are usually interpreted as high. The reliability of latent factors was calculated with the formula provided by Raines-Eudy (2000, p. 126) and is reported in Table 1. The reliability of the original Dutch scale (Garnefski et al., 2001) is also reported in Table 1. In the present study, Acceptance had acceptable reliability ($>.60$) and Positive refocusing had very good reliability ($>.80$). The other subscales had good reliability ($>.70$). The reliability of the subscales was comparable to the original study, except for acceptance which had a lower value.

In order to test whether the distinction between more appropriate and less appropriate strategies fit the data, a second CFA was computed on the variance-covariance matrix. Each strategy was defined by its respective items and two second-order factors were added. The first one was defined by the five strategies supposed to be more appropriate. The second one was defined by the four strategies supposed to be more inappropriate. A preliminary CFA indicated that the correlation between the appropriate and inappropriate strategies was negligible ($r = -.08$); thus,

<table>
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<td>7.98</td>
<td>2.80</td>
<td>.68</td>
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Note: $N = 227$ adolescents (junior secondary and secondary schools). Reliability is calculated based on the results of the confirmatory factor analysis. Original reliability is the Cronbach’s alpha of the original Dutch scale (Garnefski, Kraaij, & Spinhoven, 2001).
the covariance between the second-order factors was set to 0 in order to achieve a more parsimonious model. The results of the second-order CFA are: \(X^2(585) = 1019.59, p < .01, \text{RMSEA} = .058, 90\% \text{ CI} = (.051, .064), \) and \( \text{SRMR} = .092. \) These fit indices showed that the model distinguishing between appropriate and inappropriate strategies was acceptable. The squared multiple correlation was .15 for acceptance, .30 for positive refocusing, .48 for refocus on planning, .88 for positive reappraisal, and .55 for putting into perspective. Thus, positive reappraisal best represents the appropriate strategies. The squared multiple correlation was .40 for self-blame, .69 for rumination, .48 for catastrophizing, and .02 for blaming others. Thus, blaming others does not represent inappropriate strategies particularly well, while rumination represents them best.

The effect of age was not assessed because its distribution was not uniform. Girls had a higher score for rumination (\(M = 12.07, \text{SD} = 3.77\)) than boys (\(M = 10.88, \text{SD} = 3.24\)), a difference that was small, \(r_{pb} = -.16^*, \text{CI} = (-.29, -.03).\) Boys had a higher score for Blaming other (\(M = 8.45, \text{SD} = 2.86\)) than girls (\(M = 7.65, \text{SD} = 2.73\)), a difference that was small, \(r_{pb} = .14^*, \text{CI} = (.01, .27).\)

Cognitive emotion regulation and depression

We then computed the correlations between emotion regulation strategies assessed by the CERQ and the total depression score assessed by the RADS. The five more appropriate strategies were negatively correlated with the depression score. The effect was small for acceptance, \(r = -.11, \text{CI} = (-.30, .07)\) and for positive refocusing, \(r = -.21^*, \text{CI} = (-.38, -.02).\) The effect was moderate for refocus on planning, positive reappraisal, and Putting into perspective, respectively, \(r = -.46^*, \text{CI} = (-.59, -.29), \ r = -.43^*, \text{CI} = (-.57, -.26), \) and \(r = -.39^*, \text{CI} = (-.54, -.22).\) The total score for appropriate strategies was also related to a moderate decrease in depression, \(r = -.46^*, \text{CI} = (-.60, -.30).\) Thus, theoretically appropriate strategies were in fact related to lower scores for depression. The four more inappropriate strategies were

<table>
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<td>.21</td>
<td>.08</td>
<td>.07</td>
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<td>-.37*</td>
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<td>-.21*</td>
<td>-.15*</td>
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<td>.26</td>
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<td>.24*</td>
<td>.21*</td>
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<td>.23</td>
<td>.30*</td>
<td>.26*</td>
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<td>Catastrophizing</td>
<td>.78</td>
<td>.30</td>
<td>.19*</td>
<td>.17*</td>
</tr>
<tr>
<td>Blaming others</td>
<td>.43</td>
<td>.26</td>
<td>.11</td>
<td>.11</td>
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Note: \(N = 110\) adolescents (secondary school), semi-partial = semi-partial correlation.

*0 not included in the 95\% CI.
positively correlated with depression. The effect was moderate for self-blame, rumination, and catastrophizing: $r = .35^*, CI = (.17, .50)$, $r = .34^*, CI = (.16, .50)$, and $r = .36^*, CI = (.19, .52)$, respectively. The correlation was negligible for blaming others, $r = .08$, CI = (−.11, .26). The total score for inappropriate strategies was related to a moderate increase in depression, $r = .47^*$, CI = (.31, .61). Thus, theoretically inappropriate strategies were actually related to higher scores for depression.

A regression analysis was computed on the RADS score with the nine regulation strategies entered as predictors (Table 2). In order to find the unique contribution made by predictors and their order of importance (Howell, 1998, p. 612), we calculated semi-partial correlations. Starting with the highest absolute $r_{\text{semi-partial}}$, we found the following order of importance: refocus on planning, $r_{\text{semi-partial}} = −.37^*$, CI = (−.50, −.25); rumination, $r_{\text{semi-partial}} = .26^*$, CI = (.14, .39); self-blame, $r_{\text{semi-partial}} = .21^*$, CI = (.09, .34); catastrophizing, $r_{\text{semi-partial}} = .17^*$, CI = (.05, .29); positive reappraisal, $r_{\text{semi-partial}} = −.15^*$, CI = (−.27, −.03); blaming others, $r_{\text{semi-partial}} = .11$, CI = (−.01, .23); positive refocusing, $r_{\text{semi-partial}} = .07$, CI = (−.06, .19); putting into perspective, $r_{\text{semi-partial}} = −.04$, CI = (−.17, .08); and acceptance, $r_{\text{semi-partial}} = −.01$, CI = (−.14, .11). Considering the significant $r_{\text{semi-partial}}$, it can be concluded that refocus on planning, rumination, self-blame, catastrophizing and positive reappraisal best predict an increase or decrease in self-reported depression.

**Impulsivity**

Correlations between impulsivity, as assessed by the UPPS Scale, and emotion regulation, assessed by the CERQ, are displayed in Table 3. All non-negligible correlations ($r > .10$) showed that impulsive traits were related to the use of fewer appropriate and more inappropriate regulation strategies. The total impulsivity score was related to the use of fewer appropriate strategies (total score), $r = −.29^*$, CI = (−.45, −.11), and more inappropriate strategies (total score), $r = .27^*$, CI = (.08, .43) (small effect sizes). Thus, the distinction between appropriate and

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<td>−.26*</td>
<td>−.32*</td>
<td>.07</td>
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<tr>
<td>Putting into perspective</td>
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<td>−.29*</td>
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<td>.03</td>
<td>.06</td>
<td>−.08</td>
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*0 not included in the 95% CI.
inappropriate strategies seems to be valid as they relate to impulsive traits. In particular, Urgency was related to a moderate decrease in appropriate strategies (total score), $r = -.36^*$, CI = ($-.52$, $-.19$), as well as a moderate increase in inappropriate strategies (total score), $r = .36^*$, CI = ($.19$, $.51$). Lack of premeditation and lack of perseverance were related to a small decrease in appropriate strategies (total score), respectively, $r = -.27^*$, CI = ($-.43$, $-.08$), and $r = -.29^*$, CI = ($-.45$, $-.11$).

The four dimensions of impulsivity were positively correlated with depression. For urgency, the effect was moderate, $r = .40^*$, CI = ($.23$, $.54$). For lack of Premeditation and lack of perseverance, the correlations were small, $r = .16$, CI = ($-.03$, $.34$), $r = -.28^*$, CI = ($-.09$, $.44$). The correlation was negligible for sensation seeking, $r = .07$, CI = ($-.12$, $.26$). The total score for impulsivity was related to depression, an effect that was moderate, $r = .33^*$, CI = ($.15$, $.48$).

A regression analysis was computed on the RADS score with the four impulsive traits entered as predictors (Table 4). Based on absolute $r_{semi-partial}$, the predictors were ranked in the following order of importance: urgency, $r_{semi-partial} = .33^*$, CI = ($.17$, $.49$); lack of perseverance, $r_{semi-partial} = .18^*$, CI = ($.01$, $.34$); lack of premeditation, $r_{semi-partial} = -.06$, CI = ($-.23$, $.11$); and sensation seeking, $r_{semi-partial} = -.01$, CI = ($-.18$,$.16$). Considering the significant $r_{semi-partial}$, it can be concluded that urgency and lack of perseverance best predict an increase in self-reported depression.

**Mediation analysis**

Correlation analyses showed that urgency and lack of perseverance were significantly related to the depression score. Urgency was related to appropriate and inappropriate strategies. Lack of perseverance was related to appropriate strategies only. In turn, appropriate and inappropriate strategies were related to the depression score. Thus, it is possible that the relations between impulsive traits and depression are mediated by emotional regulation (Baron & Kenny, 1986). This mediation was tested by means of a path analysis and a model was built based on the pattern of significant correlations (see Fig. 1).

The results indicated that this model had a good fit, $X^2(4) = 5.72$, $p = .22$ (Fig. 1). All standardized regression coefficients (b) were significant. In a second model, paths were added to connect impulsive traits to depression. This yielded to a solution with $X^2(2) = 2.84$, $p = .24$. The coefficient between urgency and depression was non-significant, $b = .05$. The coefficient between lack of perseverance and depression was also non-significant, $b = .11$. A model comparison

<table>
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*Note: N = 110 adolescents (secondary school), semi-partial = semi-partial correlation.

*0 not included in the 95% CI.
indicated that the additional paths did not yield a better fit, deltaX2(2) = 2.88, p = .24. These results suggest that appropriate and inappropriate regulation strategies mediate the relationship between urgency and depression. Appropriate strategies also mediate the link between lack of perseverance and depression. Models including separate regulation strategies instead of total scores for appropriate and inappropriate strategies did not yield an acceptable fit.

Discussion

The first aim of this study was to validate a French version of the CERQ in a community sample of adolescents. The distinction between the nine original regulation strategies was replicated by means of a confirmatory factor analysis. The reliability of the subscales was good to very good and comparable to the original study (Garnefski et al., 2001), except for acceptance which had an acceptable reliability. The distinction between more appropriate and less appropriate strategies was also confirmed. Thus, the factor organization of the French CERQ is comparable to that of the original English questionnaire. The psychometric proprieties of the French translation of the CERQ should encourage researchers to use it and may also help clinicians to identify the cognitive strategies used by depressed adolescents.

The second aim was to explore the relationship between regulation strategies, depression and impulsivity in adolescence. Our results indicated that more appropriate strategies were related to lower scores for depression and impulsivity. More inappropriate strategies were related to higher scores for depression and impulsivity. Although the distinction between appropriate and inappropriate strategies received some empirical support, it is important to note that regulation strategies may be inappropriate in certain circumstances but appropriate in others. For instance, it has been argued that certain forms of rumination and self-blame may be beneficial after a trauma (e.g. Tedeschi, 1999).

A regression analysis showed that refocus on planning, self-blame, rumination, catastrophizing, and positive reappraisal best predict concurrent depression. Regression analyses done on several samples highlighted the same strategies when predicting depression (e.g. Garnefski, Legerstee et al., 2002), except for refocus on planning. Our results are therefore compatible with previous studies using the CERQ, but suggest that refocus on planning might be a key factor in
understanding adolescent depression. The appraisal theory of emotion states that sadness arises when an event compromises our objectives and when our potential for coping is low (Scherer, 2001). The ability to focus on planning may provide adolescents with a feeling that the situation can be better controlled. This may be especially important at this age, when individuals are becoming more independent and wish to have more influence on their own lives.

A path analysis indicated that more appropriate and more inappropriate strategies mediated the link between specific impulsive traits and depression. It is thus possible that impulsive adolescents are more depressed because they use appropriate strategies less frequently and/or inappropriate strategies more frequently in response to negative events. However, longitudinal studies taking into account the occurrence of negative events and their impact on emotion regulation are needed to test this causal hypothesis. Reasons other than emotion regulation may also explain why adolescents with a lack of perseverance are depressed. For instance, repeated failures to attain one’s goals due to a lack of perseverance may lead to a negative self-image and increase the risk of depression.

This study presents several limitations. The confirmatory factor analysis of the CERQ was done on a sample of junior and secondary students. However, depression and impulsivity was only assessed in the secondary school, that is, among the older adolescents (15–19 years). Further research is needed to explore the links between the French version of the CERQ, impulsivity and depression in young adolescents. In addition, the question arises of whether these relationships can be generalized to non-student adolescents. Another limitation concerns the diversity of the CERQ strategies. Gross (2001) identified suppression as a regulation strategy that has negative consequences on cognitive and social functioning in adulthood. Suppression involves inhibiting the outward signs of emotion and may also be used by adolescents. But the CERQ does not evaluate this strategy, and it could be valuable to use it along with other measures of emotion regulation.

In conclusion, this study shows that the French adaptation of the CERQ has good psychometric properties within a community sample of adolescents. It also confirms that cognitive emotion regulation strategies predict concurrent depression. It further indicates that emotion regulation mediates the link between depression and specific aspects of impulsivity. Impulsivity has been related to other psychological problems in adolescence, for instance aggression (Luengo, Carrillo-del-Pena, Otero, & Romero, 1994). In future studies, it would be interesting to find out whether emotion regulation also mediates these relationships.

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Appendix A

Alf and Graf (1999) used a method called “delta” (Eq. (2), p. 70) to estimate the variance of a squared semi-partial correlation (Eqs. (19) and (21), p. 72). But some authors advise against using
squared correlation to evaluate effect size (e.g., Rosnow & Rosenthal, 2003). We therefore applied the delta method to estimate the variance \((\text{Var} N)\) of a semi-partial correlation \((r_{\text{semi-partial}})\). Let \(r_{0A}\) be the multiple correlation between a criterion 0 and a set A of predictors. The predictor X is removed from A to obtain a subset B of predictors. Let \(r_{0B}\) be the multiple correlation between 0 and the subset B. For predictor X, we have \(|r_{\text{semi-partial}}| = (r_{0A}^2 - 2r_{0A}^2 r_{0B}^2 + r_{0B}^2 + 1)/n\), with n being the number of subjects. Note that this solution is only correct for infinitely large samples. However, according to Alf and Graf (1999, p. 74), it can be applied judiciously when the sample size is moderate (e.g., \(60 < n < 200\)). The CI is then given by \(|r_{\text{semi-partial}}| \pm 1.96\text{Var} \alpha^{1/2}\). We finally calculated the semi-partial correlation with a commonly used method in order to obtain its sign (Howell, 1998, pp. 591–592).

References


