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Regular Article

Coping with stressful life events: Cognitive emotion regulation profiles and depressive symptoms in adolescents

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Abstract

Cognitive strategies that adolescents use to cope with negative emotions might show distinct profiles of cognitive emotion regulation strategies, which could be differentially associated with depressive symptoms. In total, 411 Dutch adolescents who had experienced at least one stressful life event that required some coping strategy participated in this study, including 334 nonclinical and 77 clinically depressed adolescents (12–21 years). A person-centered approach with Latent Profile Analysis was used to identify underlying profiles of cognitive emotion regulation based on the adolescents' reports of their use of cognitive emotion regulation strategies when they were confronted with stressful life events. Nine different strategies, five adaptive and four maladaptive, were used as indicators. Four profiles with distinct features were found in the nonclinical sample, as well as in the combined sample of nonclinical and clinically depressed adolescents: *Low Regulators*, *High Regulators*, *Maladaptive Regulators*, and *Adaptive Regulators*. In both samples, the High Regulators profile was most commonly used, followed by the Adaptive, Maladaptive, and Low Regulators profile. Maladaptive Regulators endorsed higher levels of depressive symptoms relative to Low, High, and Adaptive Regulators. The findings underscore the utility of using a person-centered approach in order to identify patterns of cognitive emotion regulation deficits in psychopathology.

Keywords: adolescents, cognitive emotion regulation strategies, depressive symptoms, latent profiles, stressful life events

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Emotion regulation plays an important role in psychological well-being (Thompson, 1991; Werner & Gross, 2009). Emotion regulation can be defined as all of the external and internal processes that an individual uses to monitor, evaluate, and modify the nature and course of an emotional response in order to respond appropriately to environmental demands and achieve desired goals (Gross, 1998; Nolen-Hoeksema, 2012; Thompson, 1994). While during childhood emotions are primarily regulated on an external and behavioral level (e.g. via parental support and crying), in adolescence emotion regulation becomes more internal and cognitive (Aldwin, 2009; Kopp, 1989; Sameroff, 2010). This is because in adolescence more advanced cognitive competencies develop such as self-reflection and abstract reasoning (Garnefski, Legerstee, Kraaij, Kommer, & Teerds, 2002). Such competencies are important to regulate negative emotions adaptively and to keep control, for example when experiencing a stressful life event (Garnefski, Kraaij, & Spinhoven, 2001; Garnefski, Boon, & Kraaij, 2003).

The use of cognitive emotion regulation strategies by adolescents when they are confronted with a stressful life event, such as a romantic break up or a school change, has been suggested to be related to depressive symptoms (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Garnefski et al., 2003; Kraaij et al., 2003; Stikkelbroek, Bodden, Kleinjan, Reijnders, & Baar, 2016). Research on the association between cognitive emotion regulation strategies and depressive symptoms has led to a differentiation between adaptive and maladaptive strategies (Garnefski et al., 2001). Adaptive strategies (such as refocusing on planning by thinking about what steps to take to handle the event, positively reappraising the situation, refocusing on positive things, putting the situation into a broader perspective, and accepting what you have experienced) were found to be negatively associated with depressive symptoms (Aldao, 2013; Aldao et al., 2010; Garnefski et al., 2001). Maladaptive strategies (such as blaming yourself or others for what has happened, ruminating by continuously thinking about the feelings associated with the event, and catastrophizing by emphasizing the terror of the event) were found to be positively associated with depressive symptoms (Aldao, 2013; Aldao et al., 2010; Garnefski et al., 2001).

However, this differentiation might be too simplistic, as it overlooks the differential effect of some cognitive emotion regulation strategies on psychological well-being. It is suggested that no strategy is inherently adaptive or maladaptive because the utility and efficiency of any strategy may depend on the other strategies a person uses at the same time (Aldao, 2013; Aldao & Nolen-Hoeksema, 2012, 2013; Extremera & Rey, 2015; Mayer & Salovey, 1997). For example, the use of rumination in combination with self-blame could have a more negative effect on psychological well-being than rumination and positive reappraisal.

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Although people tend to use several strategies, cognitive emotion regulation has mainly been examined in terms of how a single strategy is related to depressive symptoms in adolescents rather than examining the use of multiple strategies simultaneously (Aldao, 2013; Aldao & Nolen-Hoeksema, 2013). Little is known about patterns of different cognitive emotion regulation strategies that operate concurrently and their relationship with depressive symptoms. Knowledge on the occurrence of such patterns of different cognitive emotion regulation strategies might be clinically relevant, as these might guide which cognitive strategies could be addressed in depression interventions focusing on cognitive emotion regulation, such as in Cognitive Behavioral Therapy (CBT) (Aldao, 2013; Dixon-Gordon, Aldao, & De Los Reyes, 2014; Stikkelbroek et al., 2016). We conducted the present study to investigate whether different cognitive emotion regulation profiles (i.e., patterns of cognitive emotion regulation strategies) in response to stressful life events can be distinguished in adolescents and whether these profiles are differentially associated with depressive symptoms.

To discover profiles of cognitive emotion regulation strategies, specific cognitive emotion regulation strategies should be studied in the context of other strategies. The idea of such profiles fits the dual process model of cognitive vulnerability underlying the development of depression (Beevers, 2005). This model involves the interplay between associative and reflective information processing. Associative processing is a quick and automatic response to a situation that is based on previous experiences. It can be seen as the default way of information processing. In depressed individuals, associative processing is often negatively biased. Reflective processing is a relatively slow and effortful way to process information, and it can be used to adjust negatively biased associative processing. However, this is only possible when sufficient cognitive abilities and resources are available to evaluate one's first reaction. Negatively biased associative processing, for instance self-blame, induces depressive symptoms only when reflective processing does not sufficiently adjust or compensate negatively biased associative processing (e.g., as happens when ruminating occurs). An increase in depressive symptoms may be averted when negatively biased associative processing is corrected by reflective processing (e.g., by putting the event into perspective) (Beevers, 2005). So, it is not only a single emotion regulation strategy that influences depressive symptomatology but also the interaction between multiple strategies. We used the idea of interaction between strategies to test whether patterns or interactions of specific cognitive emotion regulation strategies also play a role in depressive symptomatology in order to go beyond one single process or cognitive emotion regulation strategy and investigate whether there are more processes or combinations of cognitive emotion regulation strategies at play.

The complex nature of the functionality of cognitive emotion regulation strategies requires a person-centered approach, which can identify individual cognitive emotion regulation profiles (Aldao, 2013; Stikkelbroek et al., 2016). Only a few studies have used a person-centered approach to model patterns of associations among emotion regulation strategies (Dixon-Gordon et al., 2014; Lougheed & Hollestein, 2012). In these studies, both cognitive and behavioral emotion regulation strategies were included. Differences were found in how people cope with stressful situations, both in the amount and the content of regulatory strategies, resulting in multiple profiles (Dixon-Gordon et al., 2014; Lougheed & Hollestein, 2012). Lougheed and Hollenstein (2012) examined three cognitive strategies (reappraisal, adjusting, and emotional engagement) and two behavioral strategies (suppression and concealing) among adolescents. They found that adolescents who reported little use of all strategies and those who reported frequent use of the maladaptive strategies (suppression and concealing) endorsed more depressive symptoms than those who reported average use of all strategies. Dixon-Gordon and colleagues (2014) examined five cognitive strategies (acceptance, reappraisal, problem solving, rumination, and self-criticism) and two behavioral strategies (suppression and avoidance) among adults. They found that adults who reported little use of all strategies, those who reported frequent use of all strategies, and those who reported frequent use of rumination showed more depressive symptoms than adults reporting relatively frequent use of adaptive strategies. As the profiles in these studies were based on both cognitive and behavioral emotion regulation strategies, no conclusions can be drawn concerning the existence of specific patterns of cognitive emotion regulation strategies. In addition, no research has been done yet with clinically referred people, limiting the clinical implications of the findings. Besides, few studies used a multiple sample approach with a direct comparison of a nonclinical and a clinically depressed sample. Because Aldao and colleagues' (2010) research has shown that direct comparisons between nonclinical and clinical populations can be critical to delineate both normative and pathological processes, a multiple sample approach was used in this study, including a sample of nonclinical adolescents from the general population and a combined sample that also included adolescents from a clinically depressed population.

The first objective of the present study was to investigate whether different cognitive emotion regulation profiles in response to stressful life events can be distinguished in adolescents. We expected to identify four different profiles, based on the differentiation of cognitive strategies in adaptive and maladaptive strategies (Garnefski et al., 2001). More specifically, we expected profiles of adolescents who endorse (a) less use of both adaptive and maladaptive strategies relative to the sample mean; (b) more use of both adaptive and maladaptive strategies relative to the sample mean; (c) less use of adaptive strategies and more use of maladaptive strategies relative to the sample mean; and (d) more use of adaptive strategies and less use of maladaptive strategies relative to the sample mean. When profiles were found, mean age was estimated and compared among profiles. In addition, we explored how boys and girls, and (in the combined sample) nonclinical and clinically depressed adolescents, are represented across the profiles.

The second objective was to examine whether the profiles are differentially associated with depressive symptoms. More frequent use of adaptive strategies was found to be related to lower levels of depressive symptoms in adolescents and more frequent use of maladaptive strategies to higher levels of depressive symptoms (Garnefski et al., 2001). Besides, limited use of diverse emotion regulation strategies has also been related to higher levels of depressive symptoms (Dixon-Gordon et al., 2014; Lougheed & Hollestein, 2012). Therefore, we hypothesized that cognitive emotion regulation profiles characterized by relatively little use of adaptive strategies and frequent use of maladaptive strategies, and by relatively little use of both adaptive and maladaptive strategies, would be associated with more depressive symptoms than profiles characterized by relatively frequent use of adaptive strategies and little use of maladaptive strategies and by frequent use of both adaptive and maladaptive strategies.

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Table 1. Descriptive statistics of the combined sample, nonclinical sample, and clinically depressed sample

	Combined sample ($n = 411$)	Nonclinical sample ($n = 334$)	Clinically depressed sample ($n = 77$)
	M (SD)	*M (SD)*	*M (SD)*
Age in years	16.89 (2.77)	16.96 (2.91)	16.58 (2.07)
	n (%)	*n* (%)	*n* (%)
Gender			
Boys	112 (27)	98 (29)	14 (18)
Girls	299 (73)	236 (71)	63 (82)
Ethnicity			
Dutch	380 (92)	306 (92)	74 (96)
Non-Dutch	31 (8)	28 (8)	3 (4)

Methods

Participants

In total, 674 adolescents were recruited, 573 of whom were derived from the general Dutch population (referred to as the nonclinical sample) and 101 from a clinically depressed population (referred to as the clinically depressed sample). Adolescents in the clinically depressed sample suffered from a depressive disorder or a dysthymic disorder and also participated in a larger randomized controlled trial investigating the effectiveness of CBT compared with treatment as usual (Stikkelbroek, Bodden, Dekovic, & Baar, 2013). In this study, we used the pretreatment data.

The inclusion criteria for the present study were (a) that adolescents had to be between 12 and 21 years old, (b) that they had experienced at least one stressful life event so that they indeed had some experience in coping with a stressful life event, and (c) that adolescents and/or their family were not receiving psychosocial treatment or social counseling. These criteria led to the exclusion of 239 participants due to their ages' not being between 12 and 21 years old ($n = 11$), not having experienced a stressful life event ($n = 161$), or receiving treatment or social counselling ($n = 67$).

Additionally, 24 participants were excluded from the analyses due to missing information about age ($n = 1$), stressful life events ($n = 15$), psychosocial treatment or social counselling ($n = 1$), or with answers missing on all items ($n = 7$) of the Child Depression Inventory-2 (CDI-2; Bodden, Stikkelbroek, & Braet, 2016; Kovacs, 2011). Attrition analyses showed that the excluded adolescents due to missing information ($n = 24$; $M_{age} = 16.04$, $SD = 1.55$; 91.7% girls; 100% Dutch) did not significantly differ from the included adolescents in terms of age, gender, and ethnicity (all F / $\chi^2 < 4.20$, $p > .05$). For the distribution of nonclinical and clinically depressed adolescents, a significant difference was found, χ^2 (1) = 54.61, $p < .001$, $\phi = .35$. In the group of excluded adolescents, relatively more clinically depressed adolescents (83.3%) participated than in the group of included adolescents (18.7%).

The total sample (referred to as the combined sample) consisted of 411 adolescents aged 12 to 21 years, including 334 nonclinical adolescents (81.3%) and 77 clinically depressed adolescents (18.7%). Demographic variables for the combined sample and the nonclinical and clinically depressed sample separately are reported in Table 1. Demographic variables showed no significant differences between the nonclinical and clinically depressed sample in terms of age and ethnicity (all F / $\chi^2 < 1.81$, $p > .23$). For gender, a significant difference was found, χ^2 (1) = 3.93, $p = .048$, $\phi = .10$. In the clinically depressed sample, relatively more girls participated than in the nonclinical sample. However, as the effect size was small, this difference was not seen as substantial. Therefore, we did not control for gender in our analyses.

Procedure

The nonclinical sample consisted of adolescents from the general population who were recruited by independent Master's degree students who contacted their former schools and sport or youth clubs between 2011 and 2014 to ask for collaboration. After written informed consent was obtained from adolescents and their parents, self-report questionnaires were completed at home or at school.

Adolescents in the clinically depressed sample were recruited within fourteen specialized mental health care institutions throughout the Netherlands, also between 2011 and 2014. The study design was approved by the independent Medical Ethics Committee of the Utrecht Medical Centre at Utrecht University (see Stikkelbroek et al., 2013). An experienced psychologist within the mental health care institution informed the adolescents and their parents about the study. Written informed consent was obtained from adolescents and their parents, and self-report questionnaires were completed at home or at the institution. To measure the presence of a depressive disorder or dysthymic disorder, the Kiddie-Schedule for Affective Disorders and Schizophrenia, present and lifetime version (K-SADS; Kaufman et al., 1997; Reichart, Wals, & Hillegers, 2000) was administered by a trained independent researcher or therapist.

Measures

Cognitive emotion regulation strategies were investigated with the Cognitive Emotion Regulation Questionnaire (CERQ; Garnefski, Kraaij, & Spinhoven, 2002). The CERQ is a self-report questionnaire designed for people aged 12 years and older, measuring what someone thinks in response to stressful life events. It consists of 36 items, reflecting nine conceptually distinct adaptive or maladaptive strategies, each consisting of four items. The five adaptive subscales are (a) *putting into perspective* (thoughts of playing down the seriousness of the event or emphasizing the relativity when comparing it with other events); (b) *positive refocusing* (thinking about joyful and pleasant issues instead of thinking

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about the actual event); (c) *positive reappraisal* (thoughts of attaching a positive meaning to the event in terms of personal growth); (d) *acceptance* (thoughts of accepting what you have experienced and distancing yourself to what has happened); and (e) *refocus on planning* (thinking about what steps to take and how to handle the negative event). The four maladaptive subscales are (a) *self-blame* (thoughts of putting the blame of what you have experienced on yourself), (b) *other-blame* (thoughts of putting the blame of what you have experienced on the environment or another person), (c) *catastrophizing* (thoughts of explicitly emphasizing the terror of what you have experienced), and (d) *rumination* (continuously thinking about the feelings and thoughts associated with the negative event). Cognitive emotion regulation strategies were measured on a 5-point Likert scale ranging from "*almost never*" to "*almost always*". Subscale scores were obtained by summing the scores of the items belonging to a subscale (ranging from 4 to 20), with higher scores indicating more use of a specific cognitive strategy. To refine the interpretation of strategy use, Garnefski and colleagues (2002) used the following distribution as a guideline, which we also used in this study: A SD from the sample mean of a strategy of ≥ 0.20 is considered as below/above average use of a strategy, a SD of ≥ 0.70 as little/frequent use, and a SD of ≥ 1.10 as very little/frequent use. Research has shown good internal consistency and validity for the overall score and the subscales of the CERQ (Garnefski et al., 2001). In the current sample, internal consistency for the overall score was good ($\alpha = .89$). For the subscales, internal consistencies ranged from acceptable ($\alpha = .74$ for catastrophizing) to good ($\alpha = .84$ for positive refocusing).

The degree of *depressive symptoms* was measured with the CDI-2 (Bodden et al., 2016; Kovacs, 2011), a self-report questionnaire for children aged 7 to 21 years consisting of 28 items. The items offer three options of which one was chosen: nondepressed (score 0, e.g., "I feel like crying once in a while"), mildly depressed (score 1, e.g., "I feel like crying many days"), and clearly depressed (score 2, e.g., "I feel like crying every day"). The higher the total score, the more depressive symptoms the adolescent reported. Total scores could range from 0 to 56, and a score of 14 or above was considered to be clinically relevant (Bodden et al., 2016). Of the nonclinical sample, 17.4% of the adolescents ($n = 58$) had a clinically relevant score. Of the clinically depressed sample, 89.6% of the adolescents ($n = 69$) had a clinically relevant score. Research has shown good internal consistency and validity for the CDI-2 (Bodden et al., 2016). In the current sample, the measure demonstrated very good internal consistency ($\alpha = .93$).

Stressful life events were measured with the Life Event Scale (LES; Bodden & Stikkelbroek, 2010). The LES is a 23-item self-report questionnaire about three types of life events, namely *loss* (one item: death of a loved one including pets), *health threat* (eight items: e.g., serious (mental) illness and sexual/psychological abuse), and *relational or situational challenges* (14 items: e.g., parental divorce and changing schools) (Lazarus 2006). Participants were asked whether or not they had experienced the specific life event. When they had experienced the life event, respondents were asked to rate how stressful the event was from *not stressful* (0) to *very stressful* (3). Only life events that were rated as stressful (score ≥ 1) were summed into a total score. The total number of experienced stressful life events for the nonclinical sample ranged from 1 to 10 ($M = 2.48$, $SD = 1.50$) and for the clinically depressed sample from 1 to 9 ($M = 4.06$, $SD = 2.04$). For the nonclinical sample, the percentages of stressful life events reported were 21.9% for loss, 31.7% for health threats, and 91.9% for relational challenges. For the clinical sample, these were 20.8, 53.3 and 98.7%, respectively.

Data Analytic Strategy

Missing data on items of the CERQ and CDI-2 were imputed using expectation-maximization (Dempster, Laird, & Rubin, 1977) in SPSS. Descriptive statistics were calculated for cognitive emotion regulation strategies and depressive symptoms for the combined sample, nonclinical sample, and clinically depressed sample. To evaluate differences between the subgroups, multivariate analyses of variance (MANOVA) were used.

We used latent profile analysis (LPA) to identify underlying profiles of cognitive emotion regulation based on the adolescents' reports of their habitual use of different cognitive emotion regulation strategies when confronted with stressful life events (Muthén, 2001; Lubke & Muthén, 2005) in MPLUS (Muthén & Muthén, 1998–2015). In general, LPA is a person-centered approach that is used to categorize individuals into groups based on the intraindividual patterns across observed variables or indicators. In this categorization, underlying latent profiles of indicators are reflected. LPA assumes that the indicators vary independently within each latent profile (Marsh, Lüdtke, Trautwein, & Morin, 2009). In this study, multiple LPAs were used in order to identify latent cognitive emotion regulation profiles. The nine cognitive emotion regulation strategies of the CERQ were used as indicator variables. A one-profile model was evaluated first. Subsequently, profiles were added one at a time until the fit of the model did not improve. Several statistics were calculated in order to determine the fit of each model, namely the Bayesian information criterion (BIC; Schwarz, 1978), the adjusted Bayesian information criterion (adjusted BIC; Sclove, 1987), the Akaike information criterion (AIC; Akaike, 1973), and entropy. The lower the values of the (adjusted) BIC and AIC, the better the model fit (Tein, Coxe, & Cham, 2013). Entropy indicates how well a model categorizes individuals into profiles, with better categorization for values closer to 1 (Celeux & Soromenho, 1996). To compare models, two significance tests were used, namely the Vuong-Lo-Mendel-Rubin (VLMR) likelihood ratio test and the adjusted Lo-Mendell-Rubin (adjusted LMR) likelihood ratio test, with significant *p*-values indicating that the estimated model provides a better fit to the data than a model with one profile less (Tein et al. 2013). To explore whether adolescents with distinct profiles differ in age, we added age as an auxiliary variable to the model. Chi-square tests of contingencies were used to test differences in age between the profiles. To explore how boys and girls and (in the combined sample) nonclinical and clinically depressed adolescents were represented across the profiles, these variables were added as auxiliary variables to the model as well. The automatic BCH method was used, as this method avoids shifts in latent profiles when auxiliary variables are added in the model (Asparouhov & Muthén, 2014). The analyses were conducted separately for the nonclinical sample first, and then for the combined sample, including the nonclinical and clinically depressed sample. The analyses could not be conducted for the clinically depressed sample separately because of low statistical power due to the small sample size.

We conducted a one-way analysis of covariance (ANCOVA) in SPSS to compare the level of depressive symptoms across the different profiles. This analysis was also first conducted in the nonclinical sample and then for the combined sample. Age was included as a

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Table 2. Means and standard deviations of cognitive emotion regulation strategies and depressive symptoms (combined sample, nonclinical sample. and clinically depressed sample)

	Combined sample ($n = 411$)	Nonclinical sample ($n = 334$)	Clinically depressed sample ($n = 77$)
	M (SD)	*M (SD)*	*M (SD)*
Putting into Perspective	12.02 (3.82)	12.49 (3.61)	10.01 (4.08)
Positive Refocusing	11.36 (3.88)	12.08 (3.67)	8.25 (3.20)
Positive Reappraisal	12.18 (3.93)	12.89 (3.63)	9.12 (3.70)
Acceptance	11.94 (3.57)	11.88 (3.53)	12.17 (3.74)
Refocus on Planning	12.26 (3.71)	12.69 (3.61)	10.36 (3.53)
Self-Blame	9.73 (3.63)	8.93 (3.03)	13.18 (3.99)
Other-Blame	6.86 (2.79)	6.85 (2.77)	6.88 (2.92)
Catastrophizing	6.92 (2.90)	6.46 (2.59)	8.91 (3.32)
Rumination	10.59 (3.82)	9.98 (3.57)	13.21 (3.80)
Depressive symptoms	11.32 (9.92)	7.97 (6.68)	25.86 (8.49)

covariate. As the assumption of homogeneity of variance was violated, bootstrapping was used (Field, 2009). Each case was assigned to a profile based on its most likely class membership.

Results

Descriptive Analyses

Means and standard deviations for cognitive emotion regulation strategies and depressive symptoms are reported in Table 2 for the combined sample as well as the subsamples. As expected, MANOVA showed a significant difference between the subsamples, F (10, 400) = 43.96, $p < .001$, Wilk's $\Lambda = 0.476$, partial $\eta^2 = .52$. The clinically depressed sample made less use of putting into perspective (F (1, 409) = 27.89, $p < .001$; partial $\eta^2 = .06$); positive refocusing (F (1, 409) = 71.48, $p < .001$; partial $\eta^2 = .15$); positive reappraisal (F (1, 409) = 67.05, $p < .001$; partial $\eta^2 = .14$); and refocus on planning (F (1, 409) = 26.29; $p < .001$; partial $\eta^2 = .06$). Furthermore, depressed participants reported more use of self-blame (F (1, 409) = 108.24, $p < .001$; partial $\eta^2 = .21$); catastrophizing (F (1, 409) = 50.06, $p < .001$; partial $\eta^2 = .11$); and rumination (F (1, 409) = 49.88, $p < .001$; partial $\eta^2 = .11$) compared with the nonclinical sample. Besides, the clinically depressed sample reported more depressive symptoms than the nonclinical sample (F (1, 409) = 402.75, $p < .001$; partial $\eta^2 = .50$).

Cognitive Emotion Regulation Profiles in the Nonclinical Sample

A four-profile model provided the best fit to the data because it showed the best combination of fit statistics (low information criterion statistics, high entropy) and significant likelihood ratio tests. Table 3 shows the fit statistics for the models tested.

Although the five-profile model displayed the lowest values on the (adjusted) BIC and AIC statistics, this model did not show a significantly better fit to the data than the four-profile model based on the VLMR and adjusted LMR likelihood ratio tests. As such, the four-profile model was preserved as the best fitting model in the nonclinical sample. Table 4 presents the means and standard deviations of cognitive emotion regulation strategies for each of the four profiles.

Figure 1 indicates how much the use of each strategy within each profile diverged from the sample mean of the use of that strategy in the nonclinical sample (in *SD*s). Based on the pattern of cognitive emotion regulation strategies, profiles were labeled in the following manner: (a) *Low Regulators profile:* Little to very little use of both adaptive and maladaptive strategies; (b) *High Regulators profile:* Above average to frequent use of both adaptive and maladaptive strategies; (c) *Maladaptive Regulators profile:* Below average to very little use of adaptive strategies, and above average to very frequent use of maladaptive strategies; and (d) *Adaptive Regulators profile:* Average use of adaptive strategies, except for acceptance and refocus on planning (below average use), and below average use of maladaptive strategies.

For each profile, the number of adolescents, the average latent class probability, the mean age, and the number of boys and girls is reported in Table 5. Exploratory analyses tested group differences in age. The overall chi-square test of age was statistically significant, χ^2 (3) = 20.98, $p < .001$. Bonferroni corrected post hoc difference tests (at alpha level .008) showed significant age differences between the Low Regulators and High Regulators profile, χ^2 (3) = 14.81, $p < .001$, the Low Regulators and Adaptive Regulators profile, χ^2 (3) = 10.55, $p = .001$, and the Maladaptive Regulators and High Regulators profile, χ^2 (3) = 8.57, $p = .003$. Adolescents using the Low Regulators profile were significantly younger than adolescents using the High Regulators profile or the Adaptive Regulators profile, and the Maladaptive Regulators were significantly younger than the High Regulators.

Differences in Depressive Symptoms between Profiles within the Nonclinical Sample

Age was used as covariate, as significant age differences were found between the profiles. A statistically significant difference in depressive symptoms was found to be related to the cognitive emotion regulation profiles, F (3, 329) = 15.96, $p < .001$; partial $\eta^2 = 0.13$. Bonferroni-corrected pairwise comparisons revealed

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Table 3. Fit statistics for LPA models of cognitive emotion regulation profiles (nonclinical sample)

Number of classes	BIC	Adjusted BIC	AIC	Entropy	VMLR *p* value	Adj. LMR *p* value
1	15820.89	15763.79	15752.29	n/a	n/a	n/a
2	15319.06	15201.70	15178.05	0.861	<.001	<.001
3	15122.89	14945.25	14909.47	0.892	.002	.003
4	15061.60	14823.69	14775.76	0.881	.015	.016
5	15048.09	14749.91	14689.84	0.872	.235	.238

Note: BIC = Bayesian information criterion; AIC = Akaike information criterion; VLMR = Vuong-Lo-Mendell-Rubin likelihood ratio test; Adj. LMR =adjusted Lo-Mendell-Rubin likelihood ratio test; n/a = not applicable; LPA = Latent Profile Analysis.

Table 4. Means and standard deviations of cognitive emotion regulation strategies per profile (nonclinical sample)

Profile	Low Regulators	High Regulators	Maladaptive Regulators	Adaptive Regulators
	M (SD)	*M (SD)*	*M (SD)*	*M (SD)*
Putting into Perspective	8.24 (2.61)	14.44 (3.31)	8.87 (3.24)	12.52 (4.40)
Positive Refocusing	8.56 (3.01)	14.04 (4.28)	8.45 (3.23)	11.91 (3.68)
Positive Reappraisal	8.47 (3.00)	15.42 (3.06)	8.82 (3.64)	12.36 (4.88)
Acceptance	7.16 (2.30)	14.20 (3.25)	10.74 (3.04)	10.64 (4.35)
Refocus on Planning	8.10 (2.68)	15.00 (3.13)	10.27 (3.95)	11.89 (5.07)
Self-Blame	5.72 (1.69)	10.30 (3.27)	10.81 (4.28)	7.37 (2.58)
Other-Blame	4.46 (0.96)	7.84 (3.71)	8.53 (4.20)	5.61 (2.02)
Catastrophizing	4.63 (1.01)	7.16 (3.60)	9.37 (3.26)	4.95 (1.42)
Rumination	5.95 (2.05)	11.53 (3.67)	10.97 (3.75)	8.77 (4.43)

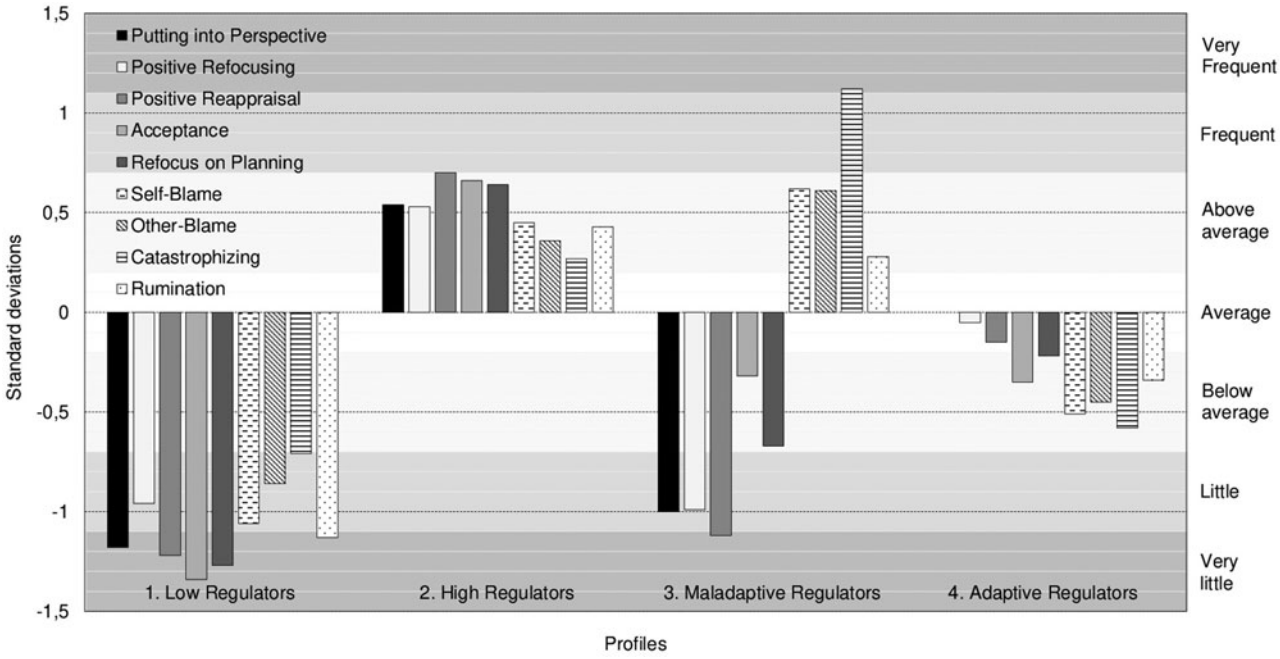

Figure 1. Standard deviations from the sample mean of cognitive emotion regulation strategies per profile (nonclinical sample).
Note: Bars colored in black and gray are adaptive strategies, white bars with a pattern are maladaptive strategies. A *SD* from the sample mean of a strategy of ≥ 0.20 is considered as below/above average use of a strategy, a *SD* of ≥ 0.70 as little/frequent use, and a *SD* of ≥ 1.10 as very little/frequent use.

that adolescents using the Maladaptive Regulators profile reported significantly more depressive symptoms on the CDI-2 ($M = 14.13$, $SD = 9.49$) than adolescents using the Low Regulators profile ($M = 5.38$, $SD = 3.92$), the Adaptive Regulators profile ($M = 6.69$, $SD = 5.13$), and the High Regulators profile ($M = 7.89$, $SD = 6.39$). Other differences were not significant.

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Table 5. Size, average latent class probability, mean age, and amount of boys and girls per profile (nonclinical sample)

Profile	Low Regulators	High Regulators	Maladaptive Regulators	Adaptive Regulators
n (%)	34 (10)	146 (44)	40 (12)	114 (34)
Average probability	.95	.95	.96	.90
M age (*SD*)	15.32 (2.86)	17.42 (2.94)	15.87 (2.93)	17.23 (3.24)
n boys (%)	9 (9)	54 (55)	8 (8)	27 (28)
n girls (%)	25 (11)	92 (39)	32 (13)	87 (37)

Note: n (%) are the final class counts and proportions for the latent classes based on the estimated model. Average probabilities represent the average probability of class membership for cases classified into each profile.

Table 6. Fit statistics for LPA models of cognitive emotion regulation profiles (combined sample)

Number of classes	BIC	Adjusted BIC	AIC	Entropy	VMLR *p* value	Adj. LMR *p* value
1	19942.04	19884.92	19869.71	n/a	n/a	n/a
2	19381.93	19264.52	19233.24	0.828	.023	.024
3	18933.02	18755.32	18707.98	0.893	<.001	<.001
4	18859.21	18621.22	18557.81	0.890	.030	.031
5	18831.28	18533.00	18453.53	0.883	.166	.169

Note: BIC = Bayesian information criterion; AIC = Akaike information criterion; VLMR = Vuong-Lo-Mendell-Rubin likelihood ratio test; Adj. LMR = adjusted Lo-Mendell-Rubin likelihood ratio test; n/a = not applicable; LPA = Latent Profile Analysis.

Table 7. Means and standard deviations of cognitive emotion regulation strategies per profile (combined sample)

Profile	Low Regulators *M (SD)*	High Regulators *M (SD)*	Maladaptive Regulators *M (SD)*	Adaptive Regulators *M (SD)*
Putting into Perspective	8.05 (2.49)	14.46 (3.33)	8.28 (3.66)	12.39 (4.84)
Positive Refocusing	8.45 (2.60)	13.55 (4.26)	7.62 (3.15)	11.76 (4.00)
Positive Reappraisal	8.01 (3.58)	15.21 (3.28)	7.86 (3.24)	12.18 (5.19)
Acceptance	7.38 (2.18)	14.29 (3.16)	11.12 (3.70)	10.52 (4.41)
Refocus on Planning	7.89 (2.88)	14.88 (3.12)	9.63 (3.98)	11.69 (5.05)
Self-Blame	5.73 (1.63)	10.66 (3.58)	12.80 (5.17)	7.45 (2.39)
Other-Blame	4.51 (1.42)	7.80 (3.41)	7.60 (3.64)	5.70 (2.28)
Catastrophizing	4.87 (1.42)	7.29 (3.52)	9.74 (3.67)	5.01 (2.29)
Rumination	6.17 (2.35)	11.92 (3.87)	12.46 (4.41)	8.69 (3.82)

Profiles in the Combined Sample (Nonclinical and Clinical Sample)

In the combined sample, including the nonclinical and clinically depressed adolescents, a four-profile model also provided the best fit to the data. Table 6 shows the fit statistics for the models tested. Table 7 presents the means and standard deviations of the use cognitive emotion regulation strategies for each of the four profiles.

Figure 2 indicates how much each strategy within each profile differed from the combined sample mean for the use of that strategy (in *SD*s). Profiles were labeled according to the pattern of cognitive emotion regulation strategies, which were similar to the profiles in the nonclinical sample: (a) *Low Regulators profile:* Little to very little use of both adaptive and maladaptive strategies; (b) *High Regulators profile:* Above average to frequent use of both adaptive and maladaptive strategies, except for catastrophizing (average use); (c) *Maladaptive Regulators profile:* Below average to very little use of adaptive strategies, and above average to frequent use of maladaptive strategies; (d) *Adaptive Regulators profile:* Average use of adaptive strategies, except for acceptance (below average use), and below average use of maladaptive strategies.

For each profile, the number of adolescents, the average latent class probability, and the mean age is reported in Table 8. In addition, Table 8 shows how boys and girls, and nonclinical and clinically depressed adolescents, are represented across profiles. Exploratory analyses tested group differences in age. The overall chi-square test of age was statistically significant, χ^2 (3) = 27.01, p < .001. Bonferroni corrected post hoc difference tests (at alpha level .008) showed significant age differences between the Low Regulators and High Regulators profile, χ^2 (3) = 15.75, p < .001, the Low Regulators and Adaptive Regulators profile, χ^2

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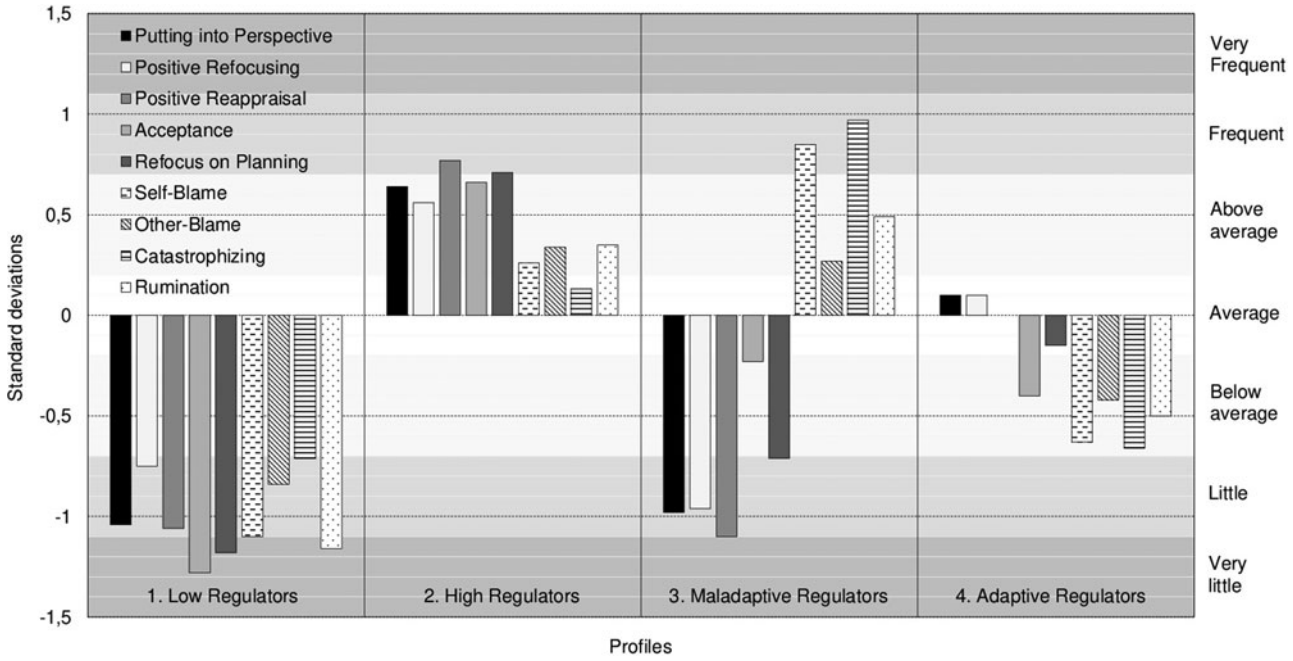

Figure 2. Standard deviations from the sample mean of the use of cognitive emotion regulation strategies per profile (combined sample).
Note: Bars colored in black and gray are adaptive strategies, white bars with a pattern are maladaptive strategies. A *SD* from the sample mean of a strategy of ≥ 0.20 is considered as below/above average use of a strategy, a *SD* of ≥ 0.70 as little/frequent use, and a *SD* of ≥ 1.10 as very little/frequent use.

Table 8. Size, average latent class probability, mean age, amount of boys and girls, and nonclinical and clinically depressed adolescents per profile (combined sample)

Profile	Low Regulators	High Regulators	Maladaptive Regulators	Adaptive Regulators
n (%)	38 (9)	169 (41)	83 (20)	121 (30)
Average probability	.93	.95	.96	.91
M age (*SD*)	15.35 (2.82)	17.36 (2.90)	16.03 (2.48)	17.28 (3.12)
n boys (%)	10 (9)	56 (50)	19 (17)	27 (24)
n girls (%)	28 (9)	113 (38)	64 (21)	94 (32)
n nonclinical adolescents (%)	34 (10)	149 (45)	37 (11)	114 (34)
n clinically depressed adolescents (%)	4 (5)	20 (26)	46 (60)	7 (9)

Note: n (%) are the final class counts and proportions for the latent classes based on the estimated model. Average probabilities represent the average probability of class membership for cases classified into each profile.

(3) = 12.24, $p < .001$, the Maladaptive Regulators and High Regulators profile, χ^2 (3) = 13.96, $p < .001$, and the Maladaptive Regulators and Adaptive Regulators profile, χ^2 (3) = 9.82, $p = .002$. Adolescents using the Low Regulators profile or the Maladaptive Regulators profile were significantly younger than adolescents using the High Regulators profile or the Adaptive Regulators profile.

Differences in Depressive Symptoms between Profiles within the Combined Sample

Again, age was used as covariate. A statistically significant difference in depressive symptoms was found to be related to the cognitive emotion regulation profiles, F (3, 406) = 59.01, $p < .001$; partial $\eta^2 = 0.30$. Bonferroni-corrected pairwise comparisons revealed that adolescents using the Maladaptive Regulators profile reported significantly more depressive symptoms on the CDI-2 ($M = 22.05$, $SD = 11.11$) than adolescents using the Low Regulators profile ($M = 7.26$, $SD = 6.82$), the Adaptive Regulators profile ($M = 7.14$, $SD = 5.62$), and the High Regulators profile ($M = 9.96$, $SD = 8.49$). Other differences were not significant.

Discussion

The goal of this study was to investigate whether different cognitive emotion regulation profiles in coping with stressful life events could be distinguished in a nonclinical sample and in a combined sample of nonclinical and clinically depressed adolescents. Both the nonclinical, as well as the clinically depressed adolescents had experienced at least one stressful life event that required coping strategies. In addition was investigated whether such profiles would be differentially associated with depressive symptoms. In both the nonclinical sample and the combined sample, the results clearly demonstrated that adolescents used four distinct profiles of

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cognitive emotion regulation strategies with different features: *Low Regulators profile* (little to very little use of all strategies); *High Regulators profile* (above average to frequent use of all strategies); *Maladaptive Regulators profile* (below average to very little use of adaptive strategies and above average to (very) frequent use of maladaptive strategies); and *Adaptive Regulators profile* (average use of adaptive strategies, except for acceptance, and below average use of maladaptive strategies). In the nonclinical sample the High Regulators profile (44%) was most commonly used to cope with stressful life events, followed by the Adaptive Regulators profile (34%) and the Maladaptive Regulators profile (12%). The Low Regulators profile was less commonly used (10%). Combining the data of nonclinical adolescents with the clinically depressed adolescents showed that the percentage of High Regulators, Adaptive Regulators, and Low Regulators became lower (41, 30, and 9%, respectively), while the percentage of Maladaptive Regulators became higher (20%). Multivariate analyses of variance had already showed that the clinically depressed sample made less use of adaptive strategies and more use of maladaptive strategies compared with the nonclinical sample.

As expected, our results showed that adolescents using the Maladaptive Regulators profile reported higher levels of depressive symptoms than adolescents using other profiles. This finding was consistent across both samples. The mean level of depressive symptoms reported by these adolescents was clinically relevant, with a mean score of 14 in the nonclinical sample and of 22 in the combined sample based on the cut-off score of 14 for the CDI-2. This is in line with earlier findings that less frequent use of adaptive strategies and more frequent use of maladaptive strategies are related to increased levels of depressive symptoms in adolescents (Aldao et al., 2010; Stikkelbroek et al., 2016). However, in this study we found that examining strategies in the context of other strategies is important, as little use of adaptive strategies or frequent use of maladaptive strategies may not always be dysfunctional. Adolescents using low levels of adaptive strategies did not report an increased level of depressive symptoms when they also used low levels of maladaptive strategies (Low Regulators profile). In addition, adolescents who frequently used maladaptive strategies did not report an increased level of depressive symptoms when adaptive strategies were used frequently as well (High Regulators profile). The results seem to highlight the importance of differentiating between different cognitive emotion regulation profiles among adolescents rather than distinguishing only adaptive and maladaptive strategies. It shows that the adaptability of cognitive emotion regulation strategies depends on the combination of the different strategies that a person has at his disposal. This is in line with the dual process model (Beevers, 2005), which suggests that the negative effect of associative processing can be adjusted by the use of reflective processing, such as in the High Regulators profile, wherein both maladaptive and adaptive strategies were commonly used and no increased level of depressive symptoms was found.

In this study, we did not find increased levels of depressive symptoms for adolescents using the Low Regulators profile, which contradicts our expectations and previous research indicating that adolescents with a limited profile of emotion regulation strategies show higher levels of depressive symptoms (Lougheed & Hollenstein, 2012). Since the adolescents in our study who used the Low Regulators profile were relatively young, it is possible that their cognitive emotion regulation strategies have not yet fully developed. It might be that they still mainly rely on social support (e.g., from parents) and behavioral strategies to regulate their emotions when confronted with stressful life events. For further research on emotion regulation profiles, it is important to involve other aspects of emotion regulation as well, such as social and behavioral aspects, and to examine whether profiles and their effect on psychological well-being change when age and different aspects of emotion regulation are taken into account.

The results of this study suggest that age or developmental stage might be important for the functionality of cognitive emotion regulation profiles. In the combined sample, adolescents using the Low Regulators profile or the Maladaptive Regulators profile were significantly younger than adolescents using the High Regulators profile or the Adaptive Regulators profile. This is in line with empirical evidence regarding developmental stage differences in the use of emotion regulation strategies in adolescence. In late adolescence (ages 16–18), all cognitive emotion regulation strategies were found to be more frequently used than in a younger age group (ages 12–15) (Garnefski & Kraaij, 2006). In addition, the way adolescents cope with negative emotions becomes more adaptive with aging (Zimmerman & Iwanksi, 2014). This could explain why adolescents using the Low Regulators or Maladaptive Regulators profile were younger than adolescents using the High Regulators or Adaptive Regulators profile. It could also explain why the High Regulators profile was used the most, as the mean age of our combined sample was almost 17 years. Future research could focus on developmental changes in the profiles of cognitive emotion regulation in adolescence. Such a longitudinal approach might detect whether cognitive emotion regulation profiles change over time. Furthermore, age specific functionality of cognitive emotion regulation profiles could be explored in future studies, as different profiles may have different functions in different stages of adolescence (Zimmerman & Iwanksi, 2014).

Strengths and Limitations

Our study is innovative for several reasons. First, the existence of *cognitive* emotion regulation profiles in coping with stressful life events were studied as well as the association with depressive symptoms. Second, research including both nonclinical and clinically depressed adolescents is scarce, but essential in studying psychopathology (Aldao et al., 2010). As adolescents from both the general population and a clinically depressed population were included in this study and the cognitive emotion regulation profiles found were consistent across the samples, the findings seem representative for nonclinical populations as well as for combined populations of nonclinical and clinically depressed adolescents who have experienced at least one stressful life event.

Several limitations of our study should be noted as well. First, the cross-sectional design permitted only analysis of cognitive emotion regulation profiles at one time point. Therefore, no conclusions can be drawn concerning the development of cognitive emotion regulation profiles in adolescence. Longitudinal research is needed to clarify the developmental course of cognitive emotion regulation profiles and its effect on psychological well-being across different stages in adolescence. Second, the cognitive emotion regulation profiles in the present study were based on the categorization of cognitive emotion regulation strategies used across stressful life-events. However, theoretical perspectives on emotion regulation are increasingly recognizing a contextual perspective, wherein the intrapersonal effects of emotion regulation are not assumed to generalize across environmental contexts (Aldao,

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2013). Indeed, Stikkelbroek and colleagues (2016) found that specific life events were associated with specific cognitive emotion regulation strategies. Further research is needed to examine the contextual nature of cognitive emotion regulation by studying cognitive emotion regulation profiles in response to different stressful life events. Third, our conclusions cannot be generalized to adolescents who have not experienced a stressful life-event. Future research could investigate whether the same cognitive emotion regulation profiles exist in all adolescents, whereby coping with daily hassles could be taken into account as well. Fourth, we could not test whether adolescents really use the strategies they reported when confronted with a stressful life event. As such, future studies should incorporate multiple methods of assessment, such as implicit cognitive emotion regulation measures in an experimental design. Additionally, though the current study focused on the conscious cognitive processes of emotion regulation, an experimental design could examine unconscious cognitive processes as well.

Clinical Implications

The findings of our study might be important for clinical practice once they have been replicated in other studies. Our results suggest that the use of maladaptive strategies is only dysfunctional, in terms of depressive symptoms, when adaptive strategies are absent. The use of adaptive strategies seems to compensate for the maladaptive strategies a person uses. Therefore, when treating clinically depressed adolescents relying on a Maladaptive Regulators profile, it might be important to increase adaptive strategies (e.g., putting into perspective) and/or to reduce maladaptive strategies (e.g., self-blame). However, these implications should be interpreted with caution, as this is still the first study that found different profiles in cognitive emotion regulation among adolescents and replication of the results is needed.

Conclusion

This study has demonstrated four different profiles of using cognitive coping strategies with distinct features. Adolescents making little use of adaptive strategies and frequent use of maladaptive strategies showed higher levels of depressive symptoms than adolescents using profiles characterized by little use of all strategies, frequent use of all strategies, and average use of adaptive strategies and little use of maladaptive strategies. The findings underscore the importance of a person-centered approach in research and clinical practice to identify profiles of cognitive emotion regulation deficits in psychopathology, and they might contribute to facilitating increased personalized treatment.

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References

Akaike, H. (1973). Information theory and an extension of the maximum likelihood principle. In B. N. Petrov & P. Czaki (Eds.), *Second international symposium on information theory* (pp. 267–281). Budapest: Akademiai Kiado.

Aldao, A. (2013). The future of emotion regulation research: Capturing context. *Perspectives on Psychological Science*, *8*, 155–172. doi: 10.1177/1745691612459518

Aldao, A., & Nolen-Hoeksema, S. (2012). When are adaptive strategies most predictive of psychopathology? *Journal of Abnormal Psychology*, *121*, 276–281. doi: 10.1037/a0023598

Aldao, A., & Nolen-Hoeksema, S. (2013). One versus many: Capturing the use of multiple emotion regulation strategies in response to an emotion-eliciting stimulus. *Cognition and Emotion*, *27*, 753–760. doi: 10.1080/02699931.2012.739998

Aldao, A., Nolen-Hoeksema, S., & Schweizer, S. (2010). Emotion regulation strategies across psychopathology: A meta-analytic review. *Clinical Psychology Review*, *30*, 217–237. doi: 10.1016/j.cpr.2009.11.004

Aldwin, C. M. (2009). *Stress, coping and development. Second Edition: An Integrative Perspective*. New York: The Guilford Press.

Asparouhov, T., & Muthén, B. (2014, August 5). Auxiliary variables in mixture modeling: 3-Step approaches using Mplus [Mplus web notes]. Retrieved from https://www.statmodel.com/download/webnotes/webnote15.pdf

Beevers, C. G. (2005). Cognitive vulnerability to depression: A dual process model. *Clinical Psychology Review*, *25*, 975–1002. doi: 10.1016/j.cpr.2005.03.003

Bodden, D. H., & Stikkelbroek, Y. A. J. (2010). *Life Events Scale*. Utrecht: Utrecht University.

Bodden, D. H., Stikkelbroek, Y., & Braet, C. (2016). *The Child Depression Inventory-2 (CDI-2)*. Amsterdam: Hogrefe Uitgevers B.V.

Celeux, G., & Soromenho, G. (1996). An entropy criterion for assessing the number of clusters in a mixture model. *Journal of Classification*, *13*, 195–212. doi: 10.1007/BF01246098

Dempster, A. P., Laird, N. M., & Rubin, D. B. (1977). Maximum likelihood from incomplete data via the EM algorithm. *Journal of the Royal Statistical Society: Series B* (*Statistical Methodology*), *39*, 1–38. doi: 10.1111/j.2517-6161.1977.tb01600.x

Dixon-Gordon, K. L., Aldao, A., & De Los Reyes, A. (2014). Repertoires of emotion regulation: A person-centered approach to assessing emotion regulation strategies and links to psychopathology. *Cognition and Emotion*, *29*, 1314–1325. doi: 10.1080/02699931.2014.983046

Extremera, N., & Rey, L. (2015). The moderator role of emotion regulation ability in the link between stress and well-being. *Frontiers in Psychology*, *6*, 1–9. doi: 10.3389/fpsyg.2015.01632

Field, A. P. (2009). *Discovering statistics using SPSS (third edition)*. London: Sage publications.

Garnefski, N., Boon, S., & Kraaij, V. (2003). Relationships between cognitive strategies of adolescents and depressive symptomatology across different types of life event. *Journal of Youth and Adolescence*, *32*, 401–408. doi: 10.1023/a:1025994200559

Garnefski, N., & Kraaij, V. (2006). Relationships between cognitive emotion regulation strategies and depressive symptoms: A comparative study of five specific samples. *Personality and Individual Differences*, *40*, 1659–1669. doi: 10.1016/j.paid.2005.12.009

Garnefski, N., Kraaij, V., & Spinhoven, P. (2001). Negative life events, cognitive emotion regulation and emotional problems. *Personality and Individual Differences*, *30*, 1311–1327. doi: 10.1016/s0191-8869(00)00113-6

Garnefski, N., Kraaij, V., & Spinhoven, P. (2002). *Handleiding voor het gebruik van de cognitive emotion regulation questionnaire [manual for the use of the cognitive emotion regulation questionnaire] (CERQ)*. Leiderdorp: Datec.

Garnefski, N., Legerstee, J., Kraaij, V., van den Kommer, T., & Teerds, J. (2002). Cognitive coping strategies and symptoms of depression and anxiety: A comparison between adolescents and adults. *Journal of Adolescence*, *25*, 603–611. doi: 10.1006/jado.2002.0507

Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology*, *2*, 271–299.

Kaufman, J., Birmaher, B., Brent, D., Rao, U., Flynn, C., Moreci, P., … & Ryan, N. (1997). Schedule for affective disorders and schizophrenia for school-age children-present and lifetime version (K-SADS-PL): Initial reliability and validity data. *Journal of the American Academy of Child and Adolescent Psychiatry*, *36*, 980–988. doi: 10.1097/00004583-199707000-00021

Kopp, C. B. (1989). Regulation of distress and negative emotions: A developmental view. *Developmental Psychology*, *25*, 343–354. doi: 10.1037//0012-1649.25.3.343

Kovacs, M. (2011). *The Child Depression Inventory 2 (CDI-2)*. Toronto, Canada: Multi Health Systems.

Kraaij, V., Garnefski, N., Wilde, E. J. de, Dijkstra, A., Gebhardt, W., Maes, S., & Doest, L., ter (2003). Negative life events and depressive symptoms in late adolescence: Bonding and cognitive coping as vulnerability factors? *Journal of Youth and Adolescence*, *32*, 185–193. doi: 10.1023/a:1022543419747

Lazarus, R. S. (2006). *Stress and emotion: A new synthesis*. New York: Springer Publishing Company.

Lougheed, J. P., & Hollenstein, T. (2012). A limited repertoire of emotion regulation strategies is associated with internalizing problems in adolescence. *Social Development*, *21*, 704–721. doi: 10.1111/j.1467-9507.2012.00663.x

Lubke, G. H., & Muthén, B. O. (2005). Investigating population heterogeneity with factor mixture models. *Psychological Methods*, *10*, 21–39. doi: 10.1037/1082-989X.10.1.21

Marsh, H. W., Lüdtke, O., Trautwein, U., & Morin, A. J. S. (2009). Classical Latent Profile Analysis of academic self-concept dimensions: Synergy of person- and variable-centered approaches to theoretical models of self-concept. *Structural Equation Modeling: A Multidisciplinary Journal*, *16*, 191–225. doi: 10.1080/10705510902751010

Mayer, J. D., & Salovey, P. (1997). What is emotional intelligence? In P. Savoley & D. Sluyter (Eds.), *Emotional development and emotional intelligence: Educational implications* (pp. 3–31). New York: Basic Books.

Muthén, B. O. (2001). Latent variable mixture modeling. In G. A. Marcoulides & R. E. Schumacker (Eds.), *New developments and techniques in structural equation modeling* (pp. 1–33). Hillsdale, NJ: Lawrence Erlbaum Associates.

Muthén, L. K., & Muthén, B. O. (1998-2015). *Mplus User's Guide. Seventh Edition*. Los Angeles, CA: Muthén & Muthén

Nolen-Hoeksema, S. (2012). Emotion regulation and psychopathology: The role of gender. *Annual Review of Clinical Psychology*, doi:10.1146/annurev-clinpsy-032511-143109

Reichart, C. G., Wals, M., & Hillegers, M. (2000). *Vertaling K-SADS*. Utrecht: H.C. Rümke Groep.

Sameroff, A. (2010). A unified theory of development: A dialectic integration of nature and nurture. *Child Development*, *81*, 6–22. doi: 10.1111/j.1467-8624.2009.01378.x

Schwarz, G. (1978). Estimating the dimension of a model. *Annals of Statistics*, *6*, 461–464. doi: 10.1214/aos/1176344136

Sclove, L. S. (1987). Application of model-selection criteria to some problems in multivariate analysis. *Psychometrika*, *52*, 333–343. doi: 10.1007/bf02294360

Stikkelbroek, Y., Bodden, D. H., Dekovic, M., & van Baar, A. L. (2013). Effectiveness and cost effectiveness of cognitive behavioral therapy (CBT) in clinically depressed adolescents: Individual CBT versus treatment as usual (TAU). *BMC Psychiatry*, *13*. doi: 10.1186/1471-244X-13-314

Stikkelbroek, Y., Bodden, D. H. M., Kleinjan, M., Reijnders, M, & van Baar, A. L. (2016). Adolescent depression and negative life events, the mediating role of cognitive emotion regulation. *PLoS ONE*, *11*. doi: 10.1371/journal.pone.0161062

Tein, J. Y., Coxe, S., & Cham, H. (2013). Statistical power to detect the correct number of classes in Latent Profile Analysis. *Structural Equation Modeling: A Multidisciplinary Journal*, *20*, 640–657. doi: 10.1080/10705511.2013.824781

Thompson, R. A. (1991). Emotional regulation and emotional development. *Educational Psychology Review*, *3*, 269–307.

Thompson, R. A. (1994). Emotional regulation: A theme in search for definition. *Monographs of the Society for Research in Child Development*, *59*, 25–52.

Werner, K., & Gross, J. J. (2009). Emotion regulation and psychopathology: A conceptual framework. In A. M. Kring, & D. M. Sloan (Eds.), *Emotion regulation and psychopathology: A transdiagnostic approach to etiology and treatment* (pp. 13–37). New York: Guilford Press.

Zimmermann, P., & Iwanski, A. (2014). Emotion regulation from early adolescence to emerging adulthood and middle adulthood: Age differences, gender differences, and emotion-specific developmental variations. *International Journal of Behavioral Development*, *38*, 182–194. doi: 10.1177/0165025413515405