



# Understanding the Constellation of Adolescent Emotional Clarity and Cognitive Response Styles when Predicting Depression: A Latent Class Analysis

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## Abstract

Adolescence is a period of human development associated with increased emotional intensity and heightened vulnerability to developing psychopathology. This study used Latent Class Analysis to identify subgroups of youth based on emotional clarity and cognitive response styles. Participants were 436 adolescents (51.8% female; 48.2% African-American/Black, 47.4% Caucasian/White) who completed measures of emotional clarity, cognitive response styles, and depression at baseline ( $M = 13.02$  years,  $SD = .83$ ), and at a 1-year and 4-year follow-up. Four classes were identified and used to predict depression outcomes. Overall, youth with above average emotional clarity who reported using a variety of adaptive cognitive response styles also had the lowest level of depressive symptoms at baseline. Class membership did not predict depressive symptoms at any follow-up. The results suggest that the unique profiles based on youth reported levels of emotional clarity and use of problem solving, distraction, and rumination, may not be more predictive of depression outcomes, beyond earlier assessments of depression or by examining these facets in isolation.

**Keywords** Latent class analysis · Adolescence · Cognitive coping · Emotional clarity · Psychopathology

## Introduction

Adolescence is a crucial period of human development, marked by intense change and growth in a variety of areas, including mental processes. Specifically, adolescents experience changes in the brain that are linked with increasing intensity of emotions, such as heightened activity in the amygdala and continued development of the prefrontal cortex (McLaughlin et al. 2015), and in parallel are increasingly prone to experiencing stressful life events (Ge et al. 1994). Given the combination of increased intensity of emotions and exposure to stressful life events, it is no surprise that individuals become more vulnerable to developing mental

health problems during the adolescent years (Hankin et al. 2007).

Well established models of developmental psychopathology (e.g., hopelessness theory, Abramson et al. 1989; Beck's Cognitive Theory; Beck 1967) outline that depression results from the interaction between cognitive vulnerabilities and stressful life events, suggesting that the way one responds to stressful or emotionally arousing events is crucial for mental health functioning. Building from this framework, the response styles theory (Nolen-Hoeksema 1991) highlights three cognitive responses to negative emotional experiences that can impact future affective states and increase risk for depression; specifically, rumination (i.e., repetitive focusing on the causes, meanings, and consequences of negative moods), distraction (i.e., the act of diverting attention away from an unwanted emotional state and transforming it into neutral or positive emotions and/or behaviors), and problem solving (i.e., thinking of strategies to overcome negative mood such as cognitively reinterpreting an event to resolve negative feelings).

As a cognitive response style, rumination is associated with poor outcomes during adolescence, including

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depressive symptoms and episodes, increases in negative thinking, and impairments in the ability to solve problems (Abela and Hankin 2011; McLaughlin and Nolen-Hoeksema 2011; Stange et al. 2016). Alternatively, children and youth who use problem-solving in response to negative moods tend to have lower levels of depressive symptoms (Abela et al. 2007; Goodman et al. 1995). Similarly, research indicates that, during adolescence, distraction is negatively associated with depressive mood states and predicts decreases in depressive symptoms over time (Muris et al. 2004; Schwartz and Koenig 1996).

Although cognitive response styles are important in predicting depression outcomes, individuals must be able to first identify what emotions they are experiencing before engaging in any emotion modulation strategies (for review, see Denham 2007). Considered both an emotional intelligence factor and an emotional regulation strategy, emotional clarity is the ability to label, discriminate, and understand one's own emotional experiences (Gohm and Clore 2000) and it also has been shown to be particularly relevant in the prediction of depression (Eastabrook et al. 2014; Flynn and Rudolph 2010; Salovey et al. 1995). Evidence suggests that adolescents with low emotional clarity are more likely to experience depression (Flynn and Rudolph 2010), whereas high levels of emotional clarity have been linked to adolescent psychosocial health, such as optimism (Extremera et al. 2007).

Emotional clarity and cognitive response styles (rumination, problem solving, and distraction) all have been highlighted as independent unique predictors of depression (Abela et al. 2007; Abela and Hankin 2011; Chang et al. 2004; Eastabrook et al. 2014; Flynn and Rudolph 2010; McLaughlin and Nolen-Hoeksema 2011; Muris et al. 2004; Nolen-Hoeksema and Morrow 1993; Schwartz and Koenig 1996; Stange et al. 2016). However, these facets do not occur in isolation and identification of emotions and choice of cognitive responses is a complex and multifaceted process (Gross and Thompson 2007). Adaptive emotion regulation requires skills in both attention to emotions and appropriate cognitive responses to emotional experiences (Gross and Thompson 2007; Nolen-Hoeksema 1991; Troy and Mauss 2011). Recent research has even suggested that the use of multiple cognitive strategies in response to emotionally arousing events may be most effective in promoting mental health (Davis and Nolen-Hoeksema 2000; Fredrickson 2004; Steffen et al. 2016; Stange et al. 2017). Specifically, a greater ability to adapt to emotionally arousing events by effectively shifting one's perspective has been related to positive outcomes such as reduced psychopathology and increased well-being (Cheng et al. 2014; Fresco et al. 2006; Kashdan and Rottenberg 2010). Yet, there is a lack of research examining the interplay between emotional clarity and multiple types of cognitive response styles simultaneously. Thus, the current

study examined emotional clarity in combination with cognitive response styles to better understand the configuration of these constructs to determine whether youth can be identified based on unique profiles of emotional clarity and cognitive responding using person-centered methods, and if the identified groups differed in concurrent and prospective depression. Given the lack of research investigating emotional clarity and cognitive response styles in concert, this study will help to identify which types of youth are at greatest risk for depression based on multiple factors simultaneously.

Based on the complex interplay of adolescent emotional clarity and cognitive response styles, we hypothesized that distinct groups of adolescents can be identified on the basis of their levels of emotional clarity and use of rumination, problem-solving and distraction. Using a person-centered approach, Latent Class Analysis (LCA), we aimed to identify subgroups of adolescents with unique patterns of coping behaviors. Given the lack of research exploring multiple types of coping strategies simultaneously using person-centered methods, there were no clear predictions about the number of classes that would best fit the data.

After identification of the class solution that best fit the data, we used these classes to predict concurrent as well as prospective (1 and 4 year follow-ups) depressive symptoms. Given that individuals with greater emotional awareness and flexibility in their use of cognitive coping strategies are likely better equipped to manage emotionally arousing events, we hypothesized that latent class profiles comprised of youth who reported high levels of emotional clarity in combination with "adaptive" cognitive coping mechanisms (problem solving, distraction) may have fewer depressive symptoms. Alternatively, we hypothesized that youth with poor emotional clarity in combination with "maladaptive" coping strategies (rumination) would have higher levels of depressive symptoms.

Examining the interplay between emotional clarity and cognitive response styles is important given that these constructs work in a complex fashion and occur quickly over a short period of time (Gross and Thompson 2007). Understanding the constellation of these facets can help to inform models of psychopathology, and determine whether particular youth are at greater risk for depression outcomes based on their profiles of responding (e.g., high or low levels of combined response methods).

An exploratory aim of the current study was to examine gender differences across emotional clarity and cognitive response style classes. There are significant gender differences in depression rates that emerge in adolescence and persist over the life course, with women experiencing depression more than men at a rate of nearly 2 to 1 (Hankin et al. 1998; Hyde et al. 2008; Twenge and Nolen-Hoeksema 2002). Differences in cognitive vulnerabilities to depression

are hypothesized to underlie this significant gender gap. Females tend to exhibit heightened levels of cognitive vulnerabilities to depression as compared to males and that these vulnerabilities partially mediate the gender difference in depression (e.g., Alloy and Abramson 2007; Hankin et al. 1998; Nolen-Hoeksema and Girgus 1994). Additionally, some evidence suggests that males exhibit significantly higher levels of emotional clarity as compared to females (Fossati et al. 2014; Oliva et al. 2014; Powell et al. 2011; Rubenstein et al. 2015). Interestingly, theory holds that it may be females' tendency to engage in ruminative thinking that erodes emotional clarity, which in turn may lead to negative mental health outcomes (Rubenstein et al. 2015). Given the well-documented gender differences in cognitive vulnerabilities to depression, as well as evidence suggesting gender differences in emotional clarity, we explored sex differences in class membership.

## Methods

### Participants

Participants included individuals recruited to participate in a large prospective study examining the development of depressive disorders in adolescents, the Adolescent Cognition and Emotion Project (ACE), which was approved by the Temple University Institutional Review Board. Participants were recruited from private and public middle schools in the Philadelphia area and through advertisements in local newspapers. Inclusion criteria for Project ACE were: (1) being 12 or 13 years old, (2) self-identifying as Caucasian/White, African-American/Black, or Biracial, and (3) having a female caregiver who could participate in the study. Exclusion criteria were: (1) inability to read or speak English, (2) presence of a severe cognitive or learning disability, cognitive impairment, psychotic disorder, developmental disorder, or any other psychiatric or medical problem that would not allow the adolescents or their female caregivers to complete the study. Informed consent or assent was obtained from all individual participants included in the study. For a thorough description of Project ACE, see Alloy et al. (2012).

The present investigation included 436 adolescents (51.8% female; 48.2% African-American/Black, 47.4% Caucasian/White; 4.4% Biracial) who completed the measures required for the LCA. A large number of participants (48.9%) were eligible for subsidized school lunch, an indicator of low socioeconomic status (SES). At Time 1, the average age of participants was 13.02 years ( $SD = .83$ ). At Time 1, participants completed measures of depressive symptoms, emotional clarity, and cognitive coping strategies. At the short- ( $M = 11.69$  months,  $SD = 6.42$ ) and long-term ( $M = 4.22$  years,  $SD = 1.44$ ) follow-ups, participants repeated

**Table 1** Demographics and study information

Variable	Mean ( <i>SD</i> )	<i>N</i> (%)
Female	–	226 (51.8)
Male	–	210 (48.2)
African American	–	210 (48.2)
Biracial	–	19 (4.4)
Caucasian	–	207 (47.4)
Eligible for free lunch	–	213 (48.9)
Average age (in years)		
Time 1	13.02 (0.83)	–
Short term follow-up	14.36 (0.95)	–
Long term follow-up	17.62 (0.71)	–
Mean CDI scores		
Time 1	7.30 (6.04)	–
Short term follow-up	6.72 (6.20)	–
Long term follow-up	6.21 (6.04)	–
Participants above the CDI Clinical cut-off score <sup>a</sup>		
Time 1	–	22 (5.1)
Short term follow-up	–	15 (4.9)
Long term follow-up	–	13 (4.8)

CDI children's depression inventory

<sup>a</sup>A clinical cut-off score of 19 was used based on recommendations for community samples (Kovacs 1992)

the depression measure. See Table 1 for detailed information about the current sample.

Project ACE is still underway and retention rates are likely to change as participants continue in the study. At the time of this manuscript, 80% of participants completed at least one follow-up visit, and 72% of the sample is continuing in the study. For this study, only participants who completed the short ( $N = 314$ ) and long term ( $N = 280$ ) follow-up were included in the follow-up analyses. Independent samples *t* tests were used to determine whether adolescents who completed only the Time 1 assessment differed on demographic or primary study variables (i.e., gender, race, SES, depression, emotional clarity, problem solving, distraction, rumination) from those who returned to complete the follow-up visits (see Table 2). These analyses revealed that adolescents who continued to participate in the study did not significantly differ from youth who only completed the Time 1 visit on any study variables.

## Measures

### Indicators of Latent Class Membership

The subscales selected as indicators of class membership are important components of youth emotional processing or cognitive coping, and have been shown to relate to depression outcomes. Four indicators comprised of the three

**Table 2** Comparison of participants who completed Time 1 only versus at least one follow-up assessment on primary study variables

Variable	t	p
Sex	− 0.72	.468
Race	1.12	.264
Eligible for free lunch	− 1.07	.284
EC time 1	− 1.00	.322
Rumination time 1	1.81	.071
Problem solving time 1	1.57	.118
Distraction time 1	0.59	.563
CDI time 1	0.10	.918

Rumination, Problem Solving, Distraction = Subscales of the Children's Response Styles Questionnaire

EC Emotional Clarity Questionnaire, CDI children's depression inventory

subscales from the Children's Response Style Questionnaire and the total score from the Emotional Clarity Questionnaire were used to form the latent classes.

The Children's Response Styles Questionnaire (CRSQ; Abela et al. 2004) is a 25-item self-report measure that assesses youth's cognitive responses to depressed mood across three subscales: problem-solving (e.g., When I am sad, I think of a way to make my problem better), rumination (e.g., When I am sad, I think about how sad I am), and distraction (e.g., When I am sad, I do something I enjoy). On the CRSQ, individuals are asked to rate how frequently they experience certain thoughts and feelings when they are sad on a scale from 1 (*never*) to 4 (*almost always*). Greater scores for each subscale indicate a greater tendency to use that response style. The CRSQ has demonstrated good internal reliability in adolescent samples (Abela et al. 2004). In the present study, reliability for the subscales of the CRSQ ranged from  $\alpha = .69$ –.89.

The Emotional Clarity Questionnaire (ECQ, Flynn and Rudolph 2010) is a 7-item self-report inventory designed to measure perceived emotional clarity. This measure was adapted from the Trait-Meta Mood Scale for adults (Salovey and Mayer 1990). The ECQ asks participants to rate responses (e.g., I usually know how I am feeling) on a scale from 1 (*not at all*) to 5 (*very much*). Higher scores on the ECQ indicate greater emotional clarity. This self-report measure has good internal validity and convergent validity with behavioral measures that evaluate the ability to process emotions (Flynn and Rudolph 2010). In the current study, the ECQ had excellent internal consistency,  $\alpha = .88$ .

### Correlates of Class Membership

We examined group differences in class membership with the gender (male, female) demographic covariate drawn from the baseline data.

### Short- and Long-Term Outcome

We assessed associations between class membership and measures of depression at the short- and long-term follow-ups.

The Children's Depression Inventory (CDI; Kovacs 1985) was administered at each time point to assess current depressive symptomatology. This 27-item self-report assessment was designed for use with children and adolescents ages 7–17. This questionnaire asks youth to report on symptoms that have occurred over the past two weeks (e.g., I am sad once in a while; I am sad many times; I am sad all the time). The CDI is the most widely-used self-report measure to assess depressive symptoms in youth and higher scores indicate greater depressive symptoms. The CDI has demonstrated good reliability in adolescent samples (Klein et al. 2005). In the present study, the CDI had excellent internal consistency,  $\alpha = .88$ .

### Data Analysis

The analyses for this study were divided into three stages. First, the data were used to model classes based on the four indicators of latent class membership (i.e., emotional clarity, problem-solving, distraction, and rumination) using Mplus 7.11 (Muthén and Muthén 1998–2015). All indicators of latent class membership were standardized (i.e., z-scores) to facilitate interpretation of the LCA. Latent class analysis was performed estimating models with one through seven classes. The 1-class model, which is the independence model based on the observed means in the data, is fit first (Nylund et al. 2007). Next, the number of classes incrementally increases until the models no longer converge and/or no longer are conceptually sound. The model with the optimal number of classes based on the Bayesian information criteria (BIC), with a lower BIC indicating better fit, and a significant parametric bootstrapped likelihood ratio test (BLRT; compares the fit of the model with  $k$  classes to the model with  $k-1$  classes to evaluate if adding an additional class significantly improves model fit), entropy (entropy ranges from 0 to 1, with higher values indicating clearer class separation; Masyn et al. 2010), and interpretability was selected (Nylund et al. 2007). The BIC and BLRT indices provide the most reliable indicators of the true number of classes (Nylund et al. 2007) and were used to guide decision making.

Next, after identification of the class solution that best fit the data, within MPlus, gender differences across class membership were examined using Chi square difference tests.

Finally, to determine whether the classes differentially predicted concurrent and prospective depressive symptoms, the manually implemented 3-step latent class analysis approach for distal outcomes recommended by Asparouhov

**Table 3** Fit indices for class model solution

Class	Log likelihood	BIC	BLRT value ( <i>p</i> )	Entropy	Class composition N (%)
1	– 2321.383	4691.388	N/A <sup>a</sup>	1	Class 1: 436 (100%)
2	– 2277.610	4634.229	87.55 (0.000)	0.54	Class 1: 227 (52%) Class 2: 209 (48%)
3	– 2241.872	4593.142	71.48 (0.015)	0.64	Class 1: 217 (50%) Class 2: 121 (28%) Class 3: 98 (22%)
4	– 2225.229	4590.245	33.29 (0.000)	0.68	Class 1: 56 (12%) Class 2: 143 (33%) Class 3: 195 (45%) Class 4: 42 (10%)
5	– 2215.876	4601.925	18.71 (0.040)	0.68	Class 1: 134 (31%) Class 2: 39 (9%) Class 3: 35 (45%) Class 4: 185 (42%) Class 5: 43 (10%)
6	– 2194.677	4589.916	15.12 (0.143)	0.75	Class 1: 88 (20%) Class 2: 15 (03%) Class 3: 49 (11%) Class 4: 196 (45%) Class 5: 42 (10%) Class 6: 46 (11%)
7	– 2186.964	4604.879	15.43 (0.092)	0.74	Class 1: 11 (03%) Class 2: 84 (19%) Class 3: 48 (11%) Class 4: 46 (11%) Class 5: 12 (03%) Class 6: 192 (44%) Class 7: 43 (10%)

BIC Bayesian information criterion, BLRT bootstrap likelihood ratio test

<sup>a</sup>BLRT is not available for the one-class model

and Muthén (2014) was used. This strategy permits testing for class differences with covariates in an SEM framework. Based on the preferred LCA model, the measurement model is determined using the most likely class membership and incorporates probability weights to address imprecision of class membership.<sup>1</sup> To determine if the classes differentially predicted the outcomes (i.e., T1, T2, and T3 depressive symptoms) the auxiliary model was constrained (i.e., null hypothesis) by setting the outcome intercept parameters for the classes to be equal when predicting the outcome. The freely estimated auxiliary model (i.e., alternative hypothesis) was then computed by allowing the classes to vary independently while predicting the outcome. When predicting prospective depressive symptoms (T2 and T3), baseline depressive symptoms (T1) were entered as a covariate. The two auxiliary models (i.e., constrained versus freely estimated) were then compared by a Chi square difference

test using loglikelihood values and scaling correction factors obtained from the maximum likelihood estimation with robust standard errors (MLR). This test statistic is comparable to an omnibus *F*-statistic in ANOVA. If the two models significantly differed, pairwise comparisons were conducted using post-hoc *t* tests to identify class differences in the prediction of distal outcomes.

## Results

Latent class analysis was performed estimating models with one through seven classes. The best fitting model as indicated by the BIC, with a lower BIC indicating better fit, and a significant BLRT, was the 4-class model (See Table 3). The BIC and BLRT indices provide the most reliable indicators of the true number of classes (Nylund et al. 2007).

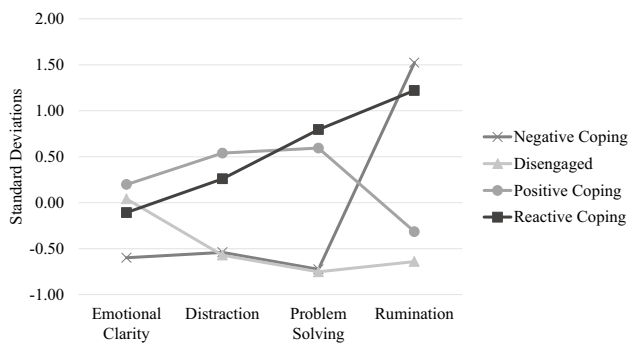
## Class Composition

In Fig. 1, the class profiles can be observed.

The first class, “Negative Coping” (12.84% of the total sample; *n* = 56), comprised participants who reported below

<sup>1</sup> To constrain individuals to their most likely class, the logits for the classification probabilities for the most likely latent class membership obtained in the first stage of data analysis were entered as parameters for each class.





**Fig. 1** Class profiles for the 4-class model. The negative coping class includes 12.84% ( $n=56$ ) of the sample; the Disengaged class includes 32.80% ( $n=143$ ) of the sample; the positive coping class includes 44.73% ( $n=195$ ) of the sample; and the reactive coping class includes 9.63% ( $n=42$ ) of the sample

**Table 4** Class composition as a function of gender

	Negative coping	Disengaged	Positive coping	Reactive coping
Gender				
Male	19.8% (11)	56.5% (81)	44.1% (86)	72.1% (30)
Female	80.2%(45)	43.5% (62)	55.9% (109)	27.9% (12)

The number of participants in each category is reported in brackets. The overall gender composition did not significantly differ by class [ $\chi^2(3, N=436)=4.38, p=.223$ ]

**Table 5** Significant differences among the four latent classes

	Negative coping	Disengaged class	Positive coping class	Reactive coping class	Constrained versus freely estimated model		
					df	$X^2$	$p$
T1 Dep	11.86 (6.23) <sup>a</sup>	7.44 (5.80) <sup>b</sup>	5.33 (4.70) <sup>c</sup>	9.37 (5.83) <sup>ab</sup>	3	47.42	<.001
Not controlling for baseline depressive symptoms							
T2 Dep	10.72 (5.96) <sup>a</sup>	6.85 (5.55) <sup>b</sup>	5.14 (6.01) <sup>c</sup>	8.36 (7.22) <sup>abc</sup>	3	27.15	<.001
T3 Dep	7.98 (6.49)	6.51 (6.39)	5.55 (5.71)	7.44 (7.06)	3	5.57	ns
Controlling for baseline depressive symptoms							
T2 Dep	10.72 (5.96)	6.85 (5.55)	5.14 (6.01)	8.36 (7.22)	3	5.37	ns
T3 Dep	7.98 (6.49)	6.51 (6.39)	5.55 (5.71)	7.44 (7.06)	3	0.41	ns

T1 Dep baseline children's depression inventory (CDI), T2 Dep short-term follow-up CDI, T3 Dep long-term follow-up CDI

<sup>a,b,c</sup>Results for post-hoc analyses; classes with different superscripts significantly differ

average levels of emotional clarity, distraction and problem solving in combination with above average levels of rumination.

The second class, "Disengaged" (32.80% of the total sample;  $n=143$ ), included participants who reported average levels of emotional clarity, with below average levels of distraction, problem solving and rumination.

The third class, "Positive Coping" (44.73% of the total sample;  $n=195$ ), comprised participants who reported

above average levels of emotional clarity, distraction and problem solving, in combination with below average levels of rumination.

The fourth class, "Reactive Coping" (9.63% of the total sample;  $n=42$ ), included participants who reported average levels of emotional clarity and distraction, with above average levels of problem solving and rumination.

### Class Membership as a Function of Gender

Table 4 shows the prevalence of membership in each latent class based on gender. Results from the Chi square difference test show that the classes did not significantly differ by gender [ $\chi^2(1, N=436)=4.38, p=.223$ ].

### Class Membership Predicting Short- and Long-Term Depressive Outcomes

When examining depressive symptoms at baseline, the constrained auxiliary model and the freely estimated auxiliary model significantly differed [ $X^2(3, N=436)=47.42, p<.001$ ]. Pairwise comparisons revealed that the positive coping class reported significantly lower levels of depressive symptoms at baseline compared to all other classes. Additionally, the negative coping class reported significantly higher levels of depressive symptoms at baseline compared to the Disengaged class (See Table 5).

After controlling for initial levels of depressive symptoms at baseline, the freely estimated auxiliary model and the constrained auxiliary model did not significantly differ for the short- or long-term depression follow-ups [ $X^2(3, N=434)=5.37, p=ns$ ;  $X^2(3, N=434)=0.41, p=ns$ , respectively].

However, to further explore the relationship between classes and depressive symptoms, we examined depressive

symptoms at the short- and long-term follow-up when initial levels of depressive symptoms at baseline were not covaried. Without controlling for initial levels of depressive symptoms at baseline, the constrained auxiliary model and the freely estimated auxiliary model significantly differed for the short-term follow-up [ $X^2(3, N=434)=27.15, p<.001$ ], but not the long-term follow-up [ $X^2(3, N=434)=5.57, p=ns$ ]. Pairwise comparisons revealed that the positive coping class reported significantly lower levels of depressive symptoms at the short-term follow-up compared to the negative coping class and the Disengaged class. Additionally, the negative coping class reported significantly higher levels of depressive symptoms compared to the disengaged coping class (See Table 5).

## Discussion

The goal of the current study was to examine emotional clarity in combination with cognitive response styles (rumination, distraction, problem solving) to better understand the configuration of these constructs to determine whether youth present with unique profiles of emotional clarity and cognitive responding, and if youth with particular profiles are at an increased risk for depression. Given that these processes often occur quickly over a short period of time (Gross and Thompson 2007), understanding the configuration of these constructs when considered simultaneously fills an important gap in the literature and sheds light on the types of adolescents who are most likely to exhibit depression. Using a person-centered approach, we identified four subgroups of adolescents with unique patterns of emotional clarity and cognitive response styles. These four classes then were used to predict depressive symptoms concurrently and at 1-year and 4-year follow-ups. The results show that youth in the positive coping class, comprised of individuals who reported above average levels of emotional clarity, distraction and problem solving, in combination with below average levels of rumination, also reported the lowest level of depressive symptoms at baseline.

Surprisingly, class composition did not significantly predict depressive symptoms at the 1-year or 4-year follow-up when controlling for baseline symptomatology. However, the positive coping class did exhibit the lowest levels of depressive symptoms at the short-term follow-up, compared to the negative coping and Disengaged classes when baseline depression was not covaried. These results suggest that the unique profiles based on youth reported levels of emotional clarity and use of problem solving, distraction, and rumination, may not be more predictive of depression outcomes, beyond earlier assessment of depression or by examining these facets in isolation.

Interestingly, there were no statistically significant gender differences across classes. Although exploratory in the current study, based on past research suggesting females are at an increased risk for depression during adolescence (Hyde et al. 2008; Twenge and Nolen-Hoeksema 2002), we expected to find that the classes would differ by gender. Males and females may differ when examining cognitive coping styles in isolation (e.g., females tend to engage in higher levels of rumination; Hankin et al. 1998), but when considering emotional clarity and cognitive response styles simultaneously, in this study, males and females had similar coping profiles.

When examining depressive symptoms as an outcome, results indicate that youth in the positive coping class concurrently reported the lowest level of depressive symptoms at baseline. This finding suggests that when an individual has above average emotional clarity and utilizes a variety of adaptive coping strategies (i.e., problem-solving and distraction), they are more likely to also report lower levels of depressive symptoms. This finding is in line with recent research suggesting cognitive flexibility, or the ability to adapt cognitive processing strategies to face new and unexpected conditions in the environment (Cañas et al. 2003), may be most beneficial to mental health (Davis and Nolen-Hoeksema 2000; Fredrickson 2004; Stange et al. 2017; Steffen et al. 2016). Moreover, this further supports the need to examine multiple emotion regulation and cognitive coping strategies simultaneously to improve identification of youth at risk for depressive symptoms, and furthers the field by examining the combination of emotional clarity, problem solving, and distraction specifically. Although the above findings highlight the relationship between youth with unique coping profiles (positive and negative) and depression, it is important to note that these cross-sectional findings do not speak to the direction of these relationships.

Surprisingly, when controlling for baseline levels of symptomatology, there were no significant differences between classes when predicting change in depressive symptoms longitudinally—at 1 year and 4 year follow-ups. After controlling for baseline depression, the varying constellations of youth based on their use of emotional clarity and cognitive coping styles did not differentially predict increases in depression. It is important to note that there was a modest correlation between participants' depression ratings at each time point ( $r=.28-.53$ ), suggesting that there may not have been enough variability in depressive symptoms over time in this community sample to detect any changes in depression. When examining the means across the classes at each time point, a pattern similar to the baseline findings was observed. Additionally, when baseline depression was not covaried, there was a significant difference between classes when predicting depressive symptoms at the 1 year follow-up. The pattern of class differences was

comparable to the baseline findings, and supports the relationship between class membership and depressive symptoms at a 1 year follow-up. Previous research has suggested that in isolation the factors used to create the classes predict change in depressive symptoms longitudinally (Abela et al. 2007; Abela and Hankin 2011; Muris et al. 2004). The findings from this study suggest that classifying youth based on the combination of how they use these skills may not be any more useful in identifying youth at risk for depression outcomes than examining the individual factors in isolation. It is important to note that adolescence is a period of significant social, emotional, and biological change (Brinthaup and Lipka 2002; Steinberg 2017), and it is possible that emotional clarity and cognitive response styles may be changing and consolidating during this time. Thus, identifying youth based on their coping profiles at baseline (age 13) may be more predictive of concurrent as opposed to changes in prospective depression. Additional research is needed to examine the change trajectories of the individual variables comprising the latent classes, as well as the latent classes themselves across adolescence.

### Strengths and Limitations

The current findings must be interpreted in light of the following limitations. First, the class indicators for this study only included emotional clarity, rumination, problem-solving and distraction; however, there are many additional vulnerability factors and coping tools that could be considered when identifying youth at risk for depression, that were not measured herein. A second limitation of the current study is the use of self-report measures for the indicators of class membership and the outcome variables. Although youth reporting on their subjective experiences of emotional coping has value, the ecological validity of the current study would be strengthened by behavioral measures of emotion regulation in vivo and interview data to determine diagnoses. Similarly, the current study did not examine the interaction between specific styles of coping and different types of life stressors (e.g., dependent, independent, social, academic, familial, etc.), as these specific coping styles may be most relevant when activated within the context of life events (e.g., positive and negative life events). Future research may aim to explore the unique classes identified in this study to determine if youth with specific coping profiles are more or less able to cope with different types of stressors.

Although this study improves previous research by using a person-centered approach with a longitudinal design, future research may aim to explore the trajectory of coping across adolescence to determine if youth are identified as using one primary combination of strategies during this time or if the class compositions change across time. It is also important to acknowledge that the entropy value

for the LCA was only marginal (.68) relative to guidelines for relying on using the most likely class membership. This suggests that the precision with which individuals are placed into classes could be improved, potentially by adding additional indicators that discriminate well between classes. Additionally, two of the identified classes exhibited relatively low sample sizes (i.e., negative coping class; reactive coping class). As a result, it is possible that we may have been underpowered to detect correlates of class membership, such as gender. Indeed, both the negative coping and reactive coping classes observed noticeable differences by gender that were not statistically significant. Thus, future research should examine correlates of class membership with larger sample sizes. Finally, the results from the current study suggest that the class profiles relate to baseline levels of depression, yet directionality of this relationship cannot be determined. Future research aimed at examining profiles of youth based on their emotional clarity and cognitive coping may target younger age groups to help decipher the relationship between the identified classes and depression.

Despite these limitations, this study had a number of strengths. Adding to the field of clinical psychology, this study sheds light on important factors that may be useful in identifying youth at risk for depression. This study also extends previous research by examining emotional clarity and cognitive coping strategies simultaneously, and by using person-centered methods to identify unique subgroups of adolescents.

### Conclusions

In the current study, we identified unique classes of adolescents based on their level of emotional clarity and use of problem-solving, distraction, and rumination to cope with negative emotional states. Building from previous research examining these factors in isolation, our results support the notion that adolescent coping is a complex process and that there is a need to examine these factors simultaneously. However, the results suggest that the unique profiles based on youth reported levels of emotional clarity and use of problem solving, distraction, and rumination, may not be more predictive of depression outcomes, beyond earlier assessments of depression or by examining these facets in isolation.

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## Compliance with Ethical Standards

**Conflict of Interest** Brae Anne McArthur, Liza M. Haas, Taylor A. Burke, Lisa E. Johnson, Thomas M. Olino, Lyn Y. Abramson and Lauren B. Alloy declare that they have no conflicts of interest.

**Informed Consent** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study.

**Animal Rights** This article does not contain any studies with animals performed by any of the authors.

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