

## Research

# Further examination of the dual-factor model: characteristics of emerging adults with non-traditional mental health profiles

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## Abstract

Traditionally, the mental health field has focused on psychological symptoms and distress, and health is considered the absence of illness. An alternative view suggests that optimal mental health must include the presence of positive characteristics in addition to the absence of illness. Accordingly, a dual-factor model of mental health includes measures of both psychopathology and positive subjective well-being to determine an individual's mental health status. The current study investigated this dual-factor model by examining whether subjective well-being and psychopathology combine to produce distinct mental health profiles in emerging adults. A sample of 559 university students completed self-report surveys indicating their life satisfaction and internalizing and externalizing symptoms. Cluster analysis yielded four unique mental health groups. The well-adjusted cluster included individuals with high life satisfaction and low internalizing and externalizing symptoms. The dissatisfied cluster consisted of individuals with low externalizing, but also low life satisfaction and slightly above-average levels of internalizing. The externalizing cluster had high life satisfaction but also high externalizing psychopathology, and the troubled cluster exhibited low life satisfaction and high levels of both psychopathology symptoms. The clusters also differed in their personality traits, coping responses, and automatic thoughts, with the most favorable pattern across all three dimensions exhibited by the well-adjusted cluster. These findings highlight the importance of considering positive indicators of mental health in addition to measures of psychopathology and support the use of an empirical classification procedure in determining the mental health status of emerging adults.

**Keywords** Subjective well-being · Life satisfaction · Mental health · Dual-factor model · Emerging adulthood

## 1 Introduction

Emerging adulthood is a transitional stage in development characterized by extensive exploration and frequent life changes [3]. The complexities of the stage often bring unique challenges, and as such, mental health issues are highly prevalent among emerging adults. More than 26% of adults aged 18–25 report experiencing mental illness in the past year, a proportion that has increased over the past decade and is higher than that of any other adult age group [34]. Mental health issues among emerging adults may include internalizing symptoms, or distress focused inward (e.g., anxiety, depression) and externalizing symptoms, or distress directed outward toward others (e.g., anger, aggression). Historically, both research and practice in mental health have focused on diagnosing and treating these psychopathology symptoms, and an absence of illness is considered equivalent to mental health [18]. It has been suggested, however, that this emphasis on symptoms is not sufficient for determining individuals' well-being [9]. Rather, optimal mental health

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must include not only the absence of psychopathology but also the presence of positive physical, mental, and social characteristics [37]. The positive psychology movement has facilitated increased interest in these strengths and competencies that help individuals to thrive [32], and evidence increasingly supports the value of considering such positive indicators (e.g., happiness, life satisfaction) in addition to more commonly-used measures of psychopathology [19, 22].

When positive well-being is considered in conjunction with psychopathology, the traditional conceptualization places both factors at opposite ends of a single mental health continuum. Accordingly, individuals with very high well-being would presumably be absent of psychopathology, and those with significant psychopathology would be unlikely to have high well-being. Alternatively, a dual-factor mental health model proposes that positive well-being and psychological distress are instead unique and multidimensional [11, 35], and factor analytic evidence supports such a model. For example, Keyes [18] examined positive mental health (emotional, psychological, and social well-being) and mental illness (depression, anxiety, and substance use) in a sample of adults. Analyses yielded significantly better support for a two-factor model compared to a one-factor model, suggesting that well-being and distress are related but distinct constructs.

The current study aims to provide further evidence for the utility of this dual-factor model, including both positive well-being and psychopathology, in emerging adults using a data-driven approach. A growing body of research provides support for the dual-factor model with this population. In these studies, college students are typically classified in terms of their mental health status by dichotomizing scores on measures of positive subjective well-being (e.g., life satisfaction, positive emotions) and measures of psychopathology (e.g., internalizing, externalizing symptoms). Thus, four distinct groups are created based on having high or low subjective well-being and high or low psychopathology [2, 9, 10, 20, 26, 30]. Some individuals are classified as “well-adjusted,” with the most favorable mental health, including high well-being and low levels of symptoms. Others, in contrast, are considered “troubled,” with the least favorable pattern, including low well-being and high symptomatology. These groups are consistent with those that would be identified with a traditional, one-dimensional model. However, two additional groups are also identified. Some individuals are considered “at-risk;” although they lacked significant psychopathology, their positive well-being is low, suggesting less than ideal mental health. Finally, some individuals exhibit an “ambivalent” or contradictory pattern, with high positive well-being but also elevated psychopathology [2, 9, 10, 20, 26, 30].

Moreover, evidence suggests that the mental health groups identified with the dual-factor model differ in key indicators of positive functioning and adaptive outcomes. Among emerging adults without significant psychopathology, the well-adjusted individuals, who also have high well-being, tend to report more positive functioning in comparison to the at-risk individuals. Evidence suggests that well-adjusted individuals have an advantage over at-risk individuals in academic outcomes, including student engagement, academic stress, conscientiousness, participation in online learning, and GPAs [2, 10, 16, 20, 23]. The well-adjusted group also tends to show a more favorable profile of psychological well-being, including increased hope, gratitude, and self-compassion, in comparison to their at-risk peers, and well-adjusted emerging adults tend to report the most favorable financial well-being, social relationships, and physical health [9, 23, 26, 27, 30]. Similarly, among the groups with elevated psychopathology, those with high well-being despite their symptoms are at an advantage in their functioning in multiple domains over those classified as troubled [2, 6, 9, 10, 20, 26, 30]. This evidence provides further indication that positive well-being and psychopathology are distinct mental health constructs, and that both factors should be considered to fully capture the complexities of emerging adults’ mental health.

These findings make valuable contributions to our understanding of the mental health of emerging adults. Most prior studies, however, utilize categorical analysis that is constrained by several limitations. First, the dichotomization of well-being and psychopathology dimensions, while consistent with widely-used procedures in clinical practice, depends on the validity of the decision points used and assumes that distinctions around those decision points are meaningful and relevant. Questions arise, therefore, regarding whether different classification procedures could be more useful and whether similar results would be obtained if different decision points were used [8, 23]. Similarly, individuals that differ only slightly on the mental health dimensions may be categorized differently if their scores fall on either side of the decision point. Deriving group membership from individuals’ exact scores instead of the dichotomous classification is an alternative strategy that may maximize distinctions between groups. Finally, despite the complex and diverse range of psychopathology symptoms that individuals experience, these prior studies either considered only one type of psychopathology symptom (internalizing) or combined internalizing and externalizing into a single dimension. This is especially problematic considering the well-established differences between internalizing and externalizing disorders and the outcomes associated with each [21].

## 1.1 The current study

The current study seeks to expand on the existing research literature in several ways. First, this study aims to provide further evidence supporting the use of the dual-factor mental health in emerging adults. Second, this study addresses some of the limitations described above by using an empirical, data-driven procedure for identifying mental health groups, rather than relying on a priori clinical decision points. Specifically, cluster analysis was implemented to classify individuals based on similar mental health characteristics. This statistical procedure delineates participants into groups such that the similarity within groups and the differences between groups are maximized [13]. Lastly, this study examines potential factors that may contribute to mental health differences by investigating group differences in characteristics that are related to mental health. One such factor is personality. The personality trait neuroticism is generally associated with mental health deficits, including decreased life satisfaction and increased internalizing symptoms, while the traits of extraversion, conscientiousness, and agreeableness are associated with greater well-being and reduced psychopathology [12, 25]. Moreover, research evidence indicates that coping, or an individual's response to stressful experiences, is also associated with mental health and well-being. For example, maladaptive coping strategies (e.g., avoidance, self-blame) have been associated with increased anxiety, while adaptive coping (e.g., problem-solving, social support-seeking) is related to increased life satisfaction and self-efficacy and decreased depression [24, 33, 36]. Additionally, automatic thoughts, or repetitive, largely uncontrollable self-statements, seem to play a role in psychological well-being. Negative automatic thoughts (e.g., "I'm a failure," "No one understands me") are strongly related to depression, anxiety, and negative affect. In contrast, positive automatic thoughts (e.g., "I will be successful," "My life is running smoothly") have been found to be associated with increased positive affect and life satisfaction and decreased depression, anxiety, and negative affect [4, 14, 15, 24]. Thus, group differences in personality, coping, and automatic thoughts were examined in the present study to determine whether they may contribute to mental health differences.

It was hypothesized that cluster analysis would identify distinct mental health groups with differing levels of life satisfaction and internalizing and externalizing symptoms. Furthermore, it was predicted that the groups would exhibit differences in personality, coping, and automatic thoughts, and that the most favorable pattern would be observed in the group with the highest life satisfaction and the lowest internalizing and externalizing symptoms.

## 2 Methods

### 2.1 Participants and procedure

Participants included 561 undergraduate students from a mid-Atlantic university in the United States. Two students did not complete the scales used in the present analyses and were therefore omitted from subsequent analysis. As described below, five additional cases were identified as outliers and excluded from cluster analysis, yielding a final sample of 554. Sixty-three percent of the sample was female, 37% was male. Approximately 83% of participants were Caucasian, 8% were African-American, and 9% were from other racial groups. A total of 15% of the participants were college seniors, 20% were juniors, 27% were sophomores, and 38% were freshmen. The average age of the participants was 19.5 years.

Approval for the study was granted by the university's ethical review board. Study information was posted on a website available to students in undergraduate psychology classes, and students could volunteer to participate to fulfill course requirements or earn extra credit. Those students who volunteered to participate were provided with an informed consent form. Upon completion of the consent form, participants were provided with access to an online questionnaire including the scales described below.

### 2.2 Measures

#### 2.2.1 Life satisfaction

The Satisfaction With Life Scale (SWLS) [7] was administered to assess life satisfaction. This scale includes five items that reflect positive life quality, and respondents rate their agreement with each on a seven-point scale (from *strongly disagree* to *strongly agree*). The SWLS has good internal consistency (Cronbach's alpha ranging from 0.83 to 0.87 in prior research), and validity of the scale has been demonstrated through positive correlations with other well-being measures and negative correlations with mental health symptoms [7, 28].

### 2.2.2 Internalizing symptoms

Internalizing symptoms were assessed using the Center for Epidemiologic Studies Depression Scale (CES-D) [29]. The scale includes 20 items reflecting symptoms of depression and anxiety, and respondents rate the degree to which they have experienced each on a four-point scale (from *rarely or none of the time* to *most or all of the time*). Cronbach's alphas have ranged from 0.84 to 0.90 in prior research. Validity of the scale is demonstrated through positive associations with other self-reports and clinical ratings of depression symptoms [29].

### 2.2.3 Externalizing symptoms

Externalizing symptoms were evaluated using an Aggression Questionnaire (AQ) developed by Buss and Perry [5]. This scale consists of 29 items stating various externalizing behaviors, including physical aggression, verbal aggression, anger, and hostility. Respondents rate the extent to which each statement applies to them on a five-point scale (from *extremely uncharacteristic of me* to *extremely characteristic of me*). Internal consistency was found to be 0.89 in previous research, and validity has been established through correlations with similar measures of emotionality, impulsivity, and competitiveness [5].

### 2.2.4 Personality

The Big Five Inventory (BFI) [17] was used to assess personality. This scale includes 44 items that evaluate each of the personality traits within the Five Factor Model, including extraversion, agreeableness, conscientiousness, neuroticism, and openness. Respondents rate their agreement with each item on a five-point scale (from *disagree strongly* to *agree strongly*). Internal consistency of the subscales ranges from 0.79 to 0.87, and validity is supported through strong, positive relationships with other measures of personality traits [17].

### 2.2.5 Coping

Coping behaviors were measured using the Coping Strategy Indicator (CSI) [1]. The CSI includes 33 items stating different coping responses within three broad categories (problem-solving, seeking social support, and avoidance). Respondents rate their use of each coping behavior in response to a self-selected stressor on a three-point scale (from *not at all* to *a lot*). Each subscale has high internal consistency, with alphas ranging from 0.84 to 0.93 in prior research. Validity has been demonstrated through correlations with other measures of coping, social resources, and symptomatology [1].

### 2.2.6 Automatic thoughts

Participants' positive and negative automatic thoughts were assessed using the Positive Automatic Thoughts Questionnaire (ATQ-P) [15] and the Negative Automatic Thoughts Questionnaire (ATQ-N) [14]. Each scale includes 30 items that reflect positive or negative automatic thoughts. Respondents rate the extent to which they experience each on a five-point scale (from *never* to *all the time*). Cronbach's alphas have ranged from 0.95 to 0.96 in prior research, and validity has been established through associations with measures of anxiety, depression, positive affect, and emotional distress [14, 15].

## 2.3 Data analysis

Descriptive statistics and Cronbach's alphas for all variables are shown in Table 1. Because cluster analysis is highly sensitive to outliers, 5 participants (0.89% of the sample) were removed due to large z-scores (exceeding  $z = \pm 3.29$ ) on any mental health variable or significant Mahalanobis' distances ( $p < 0.001$ ). All subsequent analyses were conducted with the remaining 554 participants.

Before conducting the cluster analysis, the mental health factors (life satisfaction, internalizing, and externalizing) were standardized to convert the variables to the same scale. Cluster analysis was then conducted to identify groups of individuals with different mental health characteristics. This analysis was conducted in two stages based on the recommendations of Henry et al. [13]. First, hierarchical cluster analysis using Ward's method and squared Euclidean distance was conducted to explore the most appropriate number of clusters based on the data. Although there is not

**Table 1** Descriptive statistics and scale reliabilities

Variables	<i>M</i>	<i>SD</i>	$\alpha$
SWLS	26.36	5.30	0.82
CESD	16.03	9.67	0.89
AQ	2.30	0.61	0.90
BFI			
Extraversion	3.30	0.87	0.88
Agreeableness	3.97	0.58	0.75
Conscientiousness	3.55	0.66	0.81
Neuroticism	2.89	0.81	0.83
Openness	3.51	0.61	0.77
CSI			
Problem-Solving	2.29	0.52	0.91
Seeking Social Support	2.24	0.57	0.93
Avoidance	1.98	0.44	0.79
ATQ			
Positive Thoughts	3.57	0.62	0.94
Negative Thoughts	2.02	0.76	0.97

*N* = 554. SWLS = Satisfaction With Life Scale. CESD = Center for Epidemiologic Studies Depression Scale. AQ = Aggression Questionnaire. BFI = Big Five Inventory. CSI = Coping Strategy Indicator. ATQ = Automatic Thoughts Questionnaire

one standard procedure for determining the ideal number of clusters, one widely used and accepted method is to examine the agglomeration coefficients to identify steps at which further combination of clusters yields increasing distance between cluster members [31].

Second, the cluster centers (mean life satisfaction, internalizing, and externalizing scores) were used as start values for a non-hierarchical (*K*-means) cluster analysis to yield the final cluster solution. The clusters were then validated with a MANOVA including the three mental health variables as dependent variables and cluster membership as the independent variable to verify differences between groups. Finally, the groups were compared to identify potential differences in personality, coping skills, and automatic thoughts corresponding with the differing mental health profiles.

### 3 Results

#### 3.1 Cluster Analysis

The agglomeration schedule from the hierarchical cluster analysis indicated a four-cluster solution. This solution was confirmed with the *K*-means cluster analysis. A MANOVA confirmed significant differences among the cluster groups in the mental health variables, Wilks' lambda = 0.10,  $F(9, 1334) = 232.50$ ,  $p < 0.001$ ,  $\eta^2_p = 0.54$ . The main effects of this discriminant analysis are shown in Table 2. Post hoc analyses indicated that all four groups differed significantly on each mental health variable.

The mean standardized scores on life satisfaction, internalizing, and externalizing for the four clusters are shown in Fig. 1. The clusters can be described as follows:

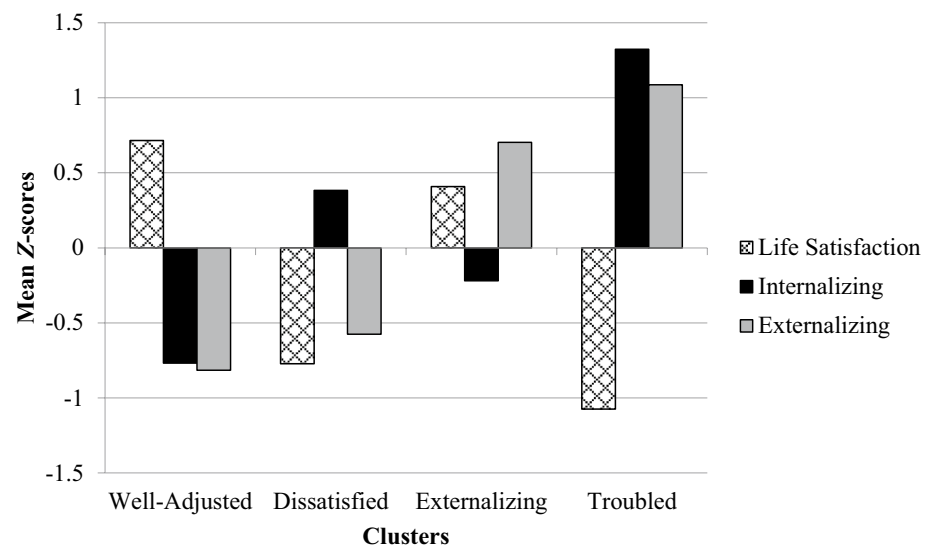
**Table 2** MANOVA main effects of cluster group on each mental health factor

Mental Health Factor	<i>F</i>	$\eta^2_p$
Life Satisfaction	227.17**	0.55
Internalizing	239.50**	0.57
Externalizing	336.65**	0.65

Degrees of freedom for each *F* test are 3, 550

\*\*  $p < 0.001$

**Fig. 1** Mental health profiles for the four-cluster solution



1. Well-Adjusted ( $N = 188$ ). These individuals had the most favorable mental health profile with high life satisfaction and well below-average levels of internalizing and externalizing symptoms.
2. Dissatisfied ( $N = 112$ ). These individuals had very low life satisfaction but also relatively low levels of psychopathology; their externalizing scores were well below average, but internalizing scores were slightly elevated.
3. Externalizing ( $N = 152$ ). This group exhibited a somewhat contradictory pattern, with good life satisfaction but also high psychopathology, specifically elevated externalizing.
4. Troubled ( $N = 102$ ). These individuals had the most distressed mental health pattern, with low life satisfaction and high levels of both internalizing and externalizing.

### 3.2 Group differences in personality traits

Three additional MANOVAs were used to examine group differences in personality traits, coping, and automatic thoughts. Statistical assumptions were tested and determined to be within acceptable ranges. The first MANOVA indicated that the mental health clusters significantly differed in personality, Wilks' lambda = 0.59,  $F(15, 1508) = 21.18$ ,  $p < 0.001$ ,  $\eta^2_p = 0.16$ . Subsequent univariate analyses indicated significant group differences in extraversion, agreeableness, conscientiousness, and neuroticism. The clusters did not differ in openness. Results of the univariate tests and the means and standard deviations for each group are reported in Table 3. Post hoc Tukey tests were conducted to determine which groups differed significantly, as indicated by mean subscripts in Table 3. In comparison to the well-adjusted individuals, the troubled individuals had significantly lower levels of extraversion, agreeableness, and conscientiousness and significantly higher levels of neuroticism (Cohen's  $d = 0.74, 1.31, 0.75$ , and  $-1.60$ , respectively). A similar pattern of significant differences was observed between the well-adjusted and dissatisfied individuals, but with more moderate effect sizes ( $d$  ranging from  $-0.74$  to  $0.50$ ). The externalizing group did not differ from the well-adjusted group on extraversion or openness, but they differed significantly on the other three traits, with much lower levels of agreeableness ( $d = 0.98$ ), somewhat lower conscientiousness ( $d = 0.34$ ), and moderately higher neuroticism ( $d = -0.65$ ) than their well-adjusted peers.

### 3.3 Group differences in coping

A second MANOVA was conducted to investigate group differences in coping strategies. Results indicated a significant difference in coping among the mental health groups, Wilks' lambda = 0.85,  $F(9, 1334) = 10.36$ ,  $p < 0.001$ ,  $\eta^2_p = 0.05$ . Subsequent univariate analyses revealed that the groups did not differ in their use of problem-solving. There were significant group differences, however, in the use of social support-seeking and avoidance. Results of the univariate tests and descriptive statistics are presented in Table 3. Post hoc comparisons using Tukey tests indicated that the well-adjusted group reported significantly more social support-seeking than both the dissatisfied and the troubled groups ( $d = 0.34$  and  $0.35$ ). Furthermore, the well-adjusted individuals had significantly lower avoidance than the other three groups ( $d$  ranging from  $-1.12$  to  $-0.42$ ), while the troubled individuals reported significantly higher avoidance than the other groups.

**Table 3** Cluster differences in personality, coping, and automatic thoughts

	Mental health cluster				F	$\eta^2_p$
	Well-Adjusted n = 188	Dissatisfied n = 112	Externalizing n = 152	Troubled n = 102		
Extraversion	3.51 <sub>a</sub> (0.85)	3.09 <sub>b</sub> (0.85)	3.46 <sub>a</sub> (0.80)	2.89 <sub>b</sub> (0.83)	16.69**	0.08
Agreeableness	4.27 <sub>a</sub> (0.50)	4.10 <sub>b</sub> (0.48)	3.76 <sub>c</sub> (0.53)	3.58 <sub>d</sub> (0.58)	50.30**	0.22
Conscientiousness	3.76 <sub>a</sub> (0.66)	3.43 <sub>b,c</sub> (0.68)	3.54 <sub>b</sub> (0.63)	3.29 <sub>c</sub> (0.57)	13.70**	0.07
Neuroticism	2.44 <sub>a</sub> (0.74)	3.00 <sub>b</sub> (0.76)	2.91 <sub>b</sub> (0.69)	3.57 <sub>c</sub> (0.63)	56.15**	0.23
Openness	3.46 (0.63)	3.49 (0.59)	3.54 (0.59)	3.56 (0.62)	0.84	0.01
Problem-Solving	2.32 (0.50)	2.31 (0.52)	2.29 (0.52)	2.23 (0.53)	0.74	0.00
Seeking Social Support	2.36 <sub>a</sub> (0.53)	2.17 <sub>b</sub> (0.57)	2.20 <sub>a,b</sub> (0.57)	2.16 <sub>b</sub> (0.63)	4.17*	0.02
Avoidance	1.80 <sub>a</sub> (0.40)	2.05 <sub>b</sub> (0.44)	1.97 <sub>b</sub> (0.40)	2.24 <sub>c</sub> (0.39)	28.01**	0.13
Positive Automatic Thoughts	3.94 <sub>a</sub> (0.43)	3.25 <sub>b</sub> (0.58)	3.72 <sub>c</sub> (0.51)	3.02 <sub>d</sub> (0.55)	92.94**	0.34
Negative Automatic Thoughts	1.47 <sub>a</sub> (0.36)	2.25 <sub>b</sub> (0.66)	1.93 <sub>c</sub> (0.57)	2.91 <sub>d</sub> (0.72)	153.15**	0.46

Degrees of freedom for each *F* test are 3, 550. Means having different subscripts are significantly different at the 0.05 level

\*  $p < 0.01$ . \*\*  $p < 0.001$

### 3.4 Group Differences in Automatic Thoughts

A third MANOVA assessed whether the groups differed in frequency of positive and negative automatic thoughts. Results indicated significant group differences in automatic thoughts, Wilks' lambda = 0.49,  $F(6, 1098) = 77.27$ ,  $p < 0.001$ ,  $\eta^2_p = 0.30$ . Subsequent univariate analyses indicated significant group differences in both positive and negative thoughts. Results of these analyses and group means are shown in Table 3. Post hoc pairwise comparisons using Tukey tests demonstrated that all four groups differed significantly on both cognitive factors. The well-adjusted individuals had the most frequent positive automatic thoughts, followed by the externalizing individuals and then the dissatisfied individuals, while the troubled group reported the least frequent positive automatic thoughts ( $d$  ranging from 0.41 to 1.93). The reverse pattern was exhibited for negative automatic thoughts, with the highest frequency reported by the troubled group, followed by the dissatisfied, externalizing, and well-adjusted groups, respectively ( $d$  ranging from 0.94 to 2.80).

## 4 Discussion

The present study provides additional support for the use of a dual-factor mental health model in emerging adults. By considering life satisfaction (an indicator of positive well-being) and internalizing and externalizing symptoms (more traditional indicators of psychopathology), four distinct groups with differing mental health profiles were identified. The well-adjusted group had high life satisfaction and low levels of both types of psychopathology symptoms, while the troubled group exhibited the opposite profile, with low life satisfaction and high internalizing and externalizing. Although these two groups are expected considering traditional models of mental health, two other less-traditional groups emerged also. The dissatisfied group had relatively low levels of psychopathology and would therefore be considered "mentally healthy" using traditional classification, but their life satisfaction was also low. Finally, the externalizing group had high life satisfaction combined with elevated psychopathology. The identification of these four groups supports the conceptualization of positive well-being and psychopathology as distinct constructs rather than opposite ends of a single continuum, consistent with the propositions of the dual-factor model.

The current study makes a unique contribution to the existing research by using cluster analysis as an empirical, data-driven procedure for classifying mental health based on both positive well-being and psychopathology. The four groups identified are largely consistent with those identified in previous research using a priori dichotomization of positive well-being and psychopathology [2, 9, 10, 20, 23, 26, 30]. The current findings, however, also add to our understanding of the groups, particularly the non-traditional dissatisfied and externalizing individuals. Specifically, the dissatisfied cluster, which typically would have been identified as low well-being, low psychopathology in prior research, actually had moderately above-average internalizing symptoms. Thus, although their symptoms may not be significant enough to be

identified as “high” using dichotomous classification, the current results suggest that they tend to experience depression and anxiety more frequently than many of their peers. Furthermore, the externalizing cluster, which would have been identified as high well-being, high psychopathology in prior research, had elevated levels of externalizing symptoms only, while their level of internalizing was below average. Accordingly, these results highlight the need to consider the *type* of psychopathology exhibited and clarify which symptoms may appear in conjunction with positive well-being. Specifically, life satisfaction may co-occur with externalizing symptoms, including physical and verbal aggression, anger, and hostility. However, the combination of high life satisfaction and high internalizing symptoms seems to be rare in this sample.

The current results also deviate from prior research in the percentage of emerging adults identified in the mental health categories. Most previous studies have found that the majority of participants belong to the well-adjusted group [23]. The specific percentage identified with the most favorable mental health profile has generally ranged from 47 to 78% in prior research [2, 9, 20, 26, 30]. However, cluster analysis yielded only 33.9% of the current sample with the well-adjusted profile. In contrast, the percentage of individuals in the other three categories is generally higher in the current results compared to prior findings. This pattern suggests that the dichotomization of positive well-being and psychopathology may mask mental health concerns affecting a substantial proportion of emerging adults.

The second aim of the study was to examine whether the clusters differed in their personalities, coping, and automatic thoughts. Several significant group differences were found, suggesting that these factors may contribute to mental health differences. These findings are consistent with previous research indicating that personality, coping, and automatic thoughts are related to both positive subjective well-being and psychopathology symptoms [4, 12, 14, 15, 24, 25, 33].

Overall, the emerging adults in the well-adjusted cluster presented the most adaptive profile across the three domains. These individuals had the highest extraversion, agreeableness, and conscientiousness and the lowest neuroticism among all clusters. They also reported using relatively more adaptive coping techniques (seeking social support) and less maladaptive coping (avoidance). This group had the most favorable cognitive pattern as well, experiencing positive automatic thoughts over 2.5 times more frequently than negative automatic thoughts.

The troubled individuals, in contrast, had the least adaptive profile of personality, coping, and cognition. They exhibited lower levels of advantageous personality traits, higher neuroticism, and less adaptive coping. The largest differences from their well-adjusted peers, however, were observed in their much more negative pattern of thinking, with negative automatic thoughts occurring almost as frequently as positive thoughts.

The dissatisfied group also exhibited differences from the well-adjusted group that were similar in direction but smaller in magnitude. Thus, they had somewhat less favorable personality traits and less adaptive coping, but their pattern was not as negative as that of their troubled peers. In particular, the smallest differences between the dissatisfied and well-adjusted groups were in agreeableness and social support seeking, suggesting that compassion toward others and seeking others in times of stress may be protective factors that help to buffer against more significant internalizing or externalizing symptoms.

Finally, the personality traits of the externalizing group were characterized by similar levels of extraversion, but slightly lower conscientiousness and neuroticism, and much lower agreeableness than their well-adjusted peers. These findings suggest that being outgoing and sociable may be a personality strength for these individuals, while having compassion for and getting along with others is a relative weakness. Furthermore, although they did not differ from the well-adjusted group in adaptive coping, they did report greater use of avoidance and more negative automatic thoughts.

## 4.1 Implications

These results have potential implications for practitioners working with college students. The findings provide further evidence supporting the use of measures of positive well-being in addition to traditional assessments of psychopathology. Thus, clinicians and educators serving emerging adults should consider including evaluations of positive well-being, such as life satisfaction, to more accurately characterize their life quality. Furthermore, these results also suggest potential limitations in relying on clinical decision points for mental health classification, as many emerging adults with less than optimal mental health may possibly be overlooked. In addition, analysis of personality, coping, and automatic thoughts suggests potential targets for intervention among the different mental health groups. For example, the negative pattern of thinking observed in the troubled cluster suggests that emerging adults with this profile could possibly benefit from cognitive interventions aimed at increasing positive thoughts, while the very low agreeableness exhibited by the externalizing cluster suggests that interventions targeting their kindness and empathy toward others may be beneficial for emerging adults with this profile.



## 4.2 Limitations and suggestions for future research

There are several limitations of the present study that should be noted. First, all data were obtained from a convenience sample including students from one university. Therefore, the generalizability of the findings is uncertain, and more research with diverse samples is needed to determine if similar clusters emerge in other populations. Second, given the cross-sectional and non-experimental study design, no inferences can be made about causality between intrapersonal characteristics and mental health. Longitudinal research is needed to begin evaluating the direction of these relationships and rule out alternative explanations. Finally, the current study was limited to a single indicator of positive well-being, life satisfaction. Future studies should explore other aspects of well-being, such as positive emotions, optimism, or gratitude, to see if comparable mental health profiles are identified.

## 5 Conclusion

This study offers insights into varying patterns of mental health among emerging adults. Results indicate that both positive well-being and psychopathology must be considered to comprehensively determine an individual's mental health. Moreover, it is suggested that simple dichotomization of well-being and psychopathology, as done in prior research and often in clinical practice, may not fully capture the complexities of mental health, and that more specific distinctions in mental health characteristics should be considered.

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**Data availability** The data that support the current study are not publicly available to protect individual privacy but are available from the corresponding author upon reasonable request.

**Code availability** Not applicable.

## Declarations

**Ethics approval and consent to participate** The research protocol was approved by the Christopher Newport University Institutional Review Board in accordance with the Revised Common Rule. Informed consent was obtained from all participants included in the study.

**Competing interests** The authors declare that they have no financial or non-financial conflicts of interest to disclose.

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