Applying the dual factor model of mental health to understanding protective factors in adolescence

Article *in* American Journal of Orthopsychiatry · March 2020

DOI: 10.1037/ort0000449

CITATIONS
0

READS
151

4 authors:

John H Grych
Marquette University
138 PUBLICATIONS **6,957** CITATIONS
SEE PROFILE

Elizabeth Taylor
Oakland University
38 PUBLICATIONS **101** CITATIONS
SEE PROFILE

Victoria Banyard
University of New Hampshire
191 PUBLICATIONS **6,739** CITATIONS
SEE PROFILE

Sherry Hamby
University of the South
259 PUBLICATIONS **17,059** CITATIONS
SEE PROFILE

American Journal of Orthopsychiatry

Applying the Dual Factor Model of Mental Health to Understanding Protective Factors in Adolescence

John Grych, Elizabeth Taylor, Victoria Banyard, and Sherry Hamby

Online First Publication, March 5, 2020. http://dx.doi.org/10.1037/ort0000449

American Journal of Orthopsychiatry

http://dx.doi.org/10.1037/ort0000449

Applying the Dual Factor Model of Mental Health to Understanding Protective Factors in Adolescence

John Grych
Marquette University

Elizabeth Taylor
Oakland University

Victoria Banyard
Rutgers University

Sherry Hamby
University of the South

Guided by the dual factor model of mental health and the resilience portfolio model, this study sought to identify protective factors that distinguish adolescents who exhibit different patterns of psychological symptoms and well-being. Participants were 466 twelve- to 17-year-old adolescents recruited from the Appalachian region of 3 Southern states who completed measures of psychological symptomatology, well-being and a range of protective factors. Analyses showed that, after accounting for adversity, the most consistent differences in both individual strengths and external resources were found between the groups who differed in well-being rather than those differing in symptoms. The findings indicate that assessing well-being in addition to psychopathology offers insights about protective factors that cannot be obtained by operationalizing health solely in terms of low levels of adjustment problems and has implications for prevention and intervention strategies designed to promote resilience in adolescents.

Public Policy Relevance Statement
Conceptualizing mental health in terms of both well-being and psychological symptoms provides a more comprehensive view of adolescents' mental health and raises the possibility that enhancing well-being could promote healthy development in youths exposed to adversity independent of symptom reduction. The present findings show that adolescents who report greater well-being regardless of their level of psychological distress generally report more protective factors than those low in well-being and suggest that some protective factors are more closely linked to well-being than to psychological symptoms.

Research investigating the effects of adversity on children and adolescents has focused primarily on psychopathology as the measure of health outcomes. Although understanding the causes of adjustment problems is important for informing efforts to prevent and treat them, focusing solely on disorder presents a narrow view of how individuals respond to adversity and of mental health more generally. Mental health is a multifaceted construct that also involves well-being and satisfaction with life, the experience of positive affect, and a sense of meaning (e.g., Howell et al., 2016; Keyes, 2007). Although psychopathology can undermine mental health, it does not determine it; individuals who experience symptoms of psychopathology in some areas of functioning can have happy and meaningful lives, and a lack of symptoms does not ensure that individuals will feel joyful and fulfilled (e.g., Keyes, 2007; Lecci, Okun, & Karoly, 1994). Empirical research also shows that well-being and psychopathology are distinct: associations between indicators of pathology and health (e.g., Antaramian, Huebner, Hills, & Valois, 2010; Keyes, 2005), tend to be medium in magnitude (Cohen, 1992), and indicators of well-being uniquely predict important outcomes in youth after accounting for symptoms of pathology (e.g., Lyons, Huebner, & Hills, 2013).

Studying factors that foster well-being in youth exposed to adversity therefore serves as an important complement to research

John Grych, Department of Psychology, Marquette University; Elizabeth Taylor, Department of Psychology, Oakland University; Victoria Banyard, School of Social Work, Rutgers University; Sherry Hamby, Department of Psychology, Life Paths Research Center, University of the South.

This work was made possible through the support of a grant from the John Templeton Foundation. The opinions expressed in this article are those of the authors and do not necessarily reflect the views of the John Templeton Foundation.

Correspondence concerning this article should be addressed to John Grych, Department of Psychology, Marquette University, Cramer Hall, Marquette University, Milwaukee, WI 53233. E-mail: john.grych@marquette.edu

on maladjustment and provides a more complete understanding of mental health. Given that the risk for a variety of psychological disorders increases over the course of adolescence (e.g., Cicchetti & Rogosch, 2002; Holmbeck, Friedman, Abad, & Jandasek, 2006), it is particularly important to identify factors associated with psychological health during this developmental period. Adolescents who are actively engaged in social relationships and in pursuing academic or occupational goals are likely to be happier and more successful than those who simply are not depressed or anxious (Seligman, 2005), and the processes that promote well-being may be different than those associated with symptoms of psychopathology (Howell et al., 2016). Guided by the dual factor model of mental health (Greenspoon & Saklofske, 2001; Suldo & Schaffer, 2008) and the resilience portfolio model (Grych, Hamby, & Banyard, 2015), the present study investigated whether there are protective factors that distinguish adolescents who exhibit different patterns of psychological symptoms and well-being.

The dual factor model (Greenspoon & Saklofske, 2001; Suldo & Schaffer, 2008) conceptualizes mental health in terms of distinct dimensions of psychopathology and well-being and argues that there are meaningful differences among individuals who vary on these dimensions. Individuals who report high levels of well-being and low levels of psychopathology are considered to have "positive mental health" in the model, whereas those who are low in well-being and high in psychopathology are described as "troubled." Those who are high in well-being while also reporting symptoms of psychopathology are labeled "symptomatic but content", and those who are low in well-being but also low in psychopathology are called "vulnerable."

Studies guided by the dual factor model have found that youths in these four groups differ on important developmental outcomes (e.g., Antaramian et al., 2010; Lyons et al., 2013; Suldo, Thalji-Raitano, Kiefer, & Ferron, 2016). As would be expected, the positive mental health group generally exhibits the best adjustment and youths in the troubled group exhibit the worst, but interesting differences have been found between groups who differ in well-being but share similar levels of symptoms and between groups who are similar in well-being but differ in symptoms. For example, Suldo and Schaffer (2008) showed that 6th through 8th graders in the positive mental health group had higher scores on measures of academic and social competence than those in the vulnerable group, indicating that higher well-being is associated with better outcomes even when symptoms are low. Antaramian et al. (2010) found that 7th and 8th graders in the troubled and vulnerable groups, who share low well-being but differ significantly on symptoms, were similar on most academic and social outcomes. Lyons et al.'s (2013) 5-month follow-up of this sample also showed that the positive mental health and symptomatic but content groups, who share high well-being but differ on symptoms, showed increasing emotional engagement in school over time whereas the troubled and vulnerable youth exhibited decreasing emotional engagement.

The dual factor model has important implications for understanding resilience in youths exposed to adversity. It raises the possibility that there are protective factors associated with well-being that are distinct from those associated with psychopathology and suggests that it may be possible to enhance youths' psychological functioning by fostering their well-being regardless of their level of symptomatology. This hypothesis rarely has been tested because most studies of resilience in childhood assess only symptoms of psychopathology, implicitly equating health with the absence of pathology (see Yule, Houston, & Grych, 2019). By failing to assess positive indicators of psychological functioning, this approach does not distinguish between youths who have similar levels of symptoms but differ in well-being and cannot address whether there may be protective factors that have distinct associations with symptoms and well-being.

Studies of the dual factor model provide initial evidence that conceptualizing psychological health in terms of both positive and negative indicators offers insights not achievable by focusing solely on psychological symptoms or on well-being alone. To date these investigations have focused primarily on academic outcomes and rarely have examined protective factors that may help explain why these differences exist. One study that examined potential sources of social support (Antaramian et al., 2010) found that middle schoolers in the positive mental health group reported the most family and teacher support, and that the symptomatic but content group reported more of all types of support than the troubled or vulnerable groups, both of whom report lower levels of well-being (also see Magalhães & Calheiros, 2017; Suldo & Schaffer, 2008). These findings indicate that there may be protective factors that have different effects on well-being and psychopathology; however, the dual factor model does not offer a conceptual basis for understanding why these differences may exist.

A recently developed conceptual framework, the resilience portfolio model (Grych et al., 2015), does describe how protective factors may promote psychological health in the face of adversity. This model draws on research on resilience, positive psychology, posttraumatic growth, and coping to provide a more comprehensive understanding of how resilience develops. It proposes that there are direct and indirect processes through which protective factors affect individuals' exposure and reaction to stressful experiences. The model groups protective factors into external resources (e.g., parental support, community cohesion) and internal assets (e.g., emotion regulation, sense of purpose), which are further classified into three categories that represent their function: self-regulation, interpersonal relationships, and meaning-making.

In the first empirical investigation of the Resilience Portfolio Model, Hamby, Grych, and Banyard (2018) examined associations among strengths described in the model and multiple measures of health in a large sample of adolescents and adults living in Appalachia. The study found that several strengths uniquely predicted functioning in important domains after accounting for psychological symptoms, exposure to adversity, and the total number of strengths in their "portfolio": Greater subjective well-being was related to participants' self-reports of higher levels of endurance, purpose, optimism, and generativity, and low levels of psychological symptoms were associated with greater emotional awareness, emotion regulation, purpose, and optimism. Banyard, Hamby, and Grych (2017) examined protective factors in relation to physical health in the same sample and found that several uniquely predicted better health, including emotional regulation, community support, and support from friends.

Although these studies suggest that certain strengths and resources may be particularly important for understanding health and well-being, by examining each outcome separately they do not indicate whether these protective factors distinguish individuals who report different patterns of well-being and psychopathology.

Person-centered analyses that simultaneously consider both individuals' level of well-being and symptomatology offer an alternative analytic approach that can address whether adolescents who report both high well-being and low symptoms exhibit different protective factors than those who report high well-being and high levels of psychological symptoms or those who report low well-being and low symptoms.

Present Study

Guided by the dual factor model of mental health, the current study examined whether individual strengths and external resources identified in the resilience portfolio model can distinguish adolescents who report high levels of well-being and low levels of psychological symptoms ("positive mental health"), those high in well-being and psychological symptoms ("symptomatic but content"), those low in both well-being and symptoms ("vulnerable"), and those reporting low well-being and high levels of symptomatology ("troubled"). We investigated this question in a sample of adolescents living in Appalachia, an economically disadvantaged region of the country with poorer access to health care and other services that increase the adversity burden of youth and their families (e.g., Banyard et al., 2017). Individuals living in Appalachia also exhibit notable strengths, including a strong attachment to their region, sense of community, and spirituality (Gore, Sheppard, Waters, Jackson, & Brubaker, 2016; Woodard, 2011). We assessed individual strengths that were found to be uniquely associated with either indicators of well-being or psychological distress in Hamby et al. (2018), as well as resources such as supportive relationships with family and friends, which consistently predict resilience in youths (for a review, see Yule et al., 2019).

Method

Participants

Participants were 466 twelve- to 17-year-old adolescents recruited from the Appalachian region of 3 Southern states (M age = 14.9, SD = 1.7). The sample was 60% female and identified as 75.2% White/European American (non-Latino), 8.1% Black/African American (non-Latino), 7.3% Latino (any race), 1.5% American Indian/Alaska Native, 0.4% Asian, 0.4% Pacific Islander, and 7.0% multiracial. Adolescents reported that their average family income was between $20,000 and $30,000; nearly half (42.3%) reported their family received some form of public assistance.

Procedure

Participants were recruited through a range of advertising techniques in order to allow us to reach segments of the population who are rarely included in psychological research. The majority of participants (75.2%) were recruited at local community events, such as festivals and county fairs. Word-of-mouth was the second most productive recruitment strategy, accounting for 14.2% of participants. The remaining 10.6% were recruited through other strategies, including flyers, newspaper and radio ads, and direct mail. This region of Appalachia still has limited and often unreliable cellular and Internet service; therefore, the survey software was specifically chosen to operate without Internet connectivity on laptops and iPads. An audio option was available. Technical problems (such as iPads overheating) and time limitations prevented some individuals from completing the survey; overall, the completion rate was 85% and the median completion time was 53 min. Participants provided informed assent and their parents provided informed consent. All participants received a $30 Walmart gift card and information on local resources. All procedures were conducted in accordance with American Psychology Association ethical principles and approved by the institutional review board of the study's home institution (University of the South; "The Laws of Life Essay Contest: An Evaluation").

Measures

The measures used in this study were a subset of a larger survey given to adolescents and adults. To keep the survey relatively brief and ensure that the reading level required was appropriate for adolescents as well as adults with a range of reading ability, we simplified and adapted items from existing questionnaires and wrote new items for constructs for which no suitable measure could be found. To establish reliability and validity for new and adapted items, we conducted a pilot study with 108 participants from the same community as the main sample, recruited through a local e-mail classifieds list and word-of-mouth. Internal consistencies for the pilot averaged .81 (range .58 to .95) and improved to an average of .84 in the main sample (range .63 to .94). Validity was established in the pilot and main samples with moderate correlations with related constructs. Factor analysis in the main sample was also used for further item reduction and clarifying of constructs. Further details on each measure are below. Unless specified, response categories were on a 4-point Likert scale ranging from 1 (*not true about me*) to 4 (*mostly true about me*). Standardizing response categories across items reduces the respondent burden, shortens survey time, minimizes method variance, and is common for large scale community surveys (e.g., Finkelhor, Turner, Hamby, & Ormrod, 2011). The level of missing data across measures was quite low, ranging from 1% to 6%; missing data were imputed based on responses to other items on same scale. See Hamby, Grych, and Banyard (2013) or http://lifepathsresearch.org for further details on measure development.

Creating Mental Health Groups

There is no standard method for classifying participants into the four Dual Factor groups, but studies investigating this model follow a consistent logic. Measures of symptoms of psychological distress and well-being that have normative or representative data available are used to provide a basis for categorizing participants that is not dependent on the values of the sample assessed in a particular study. Scores on these measures are divided into two groups representing high or low levels of symptoms or well-being. Two questionnaires were included in the present study that have been used with large, representative samples and can provide a solid empirical basis for establishing cut-off scores.

Subjective well-being. The Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985) was used to categorize

youths into high and low Well-Being groups. This five-item measure assesses respondents' perception of how well their life is going and has been completed by thousands of people worldwide. A sample item is "I am satisfied with my life." Although developed with adult samples, studies from multiple countries support its validity for use with adolescents (e.g., Di Fabio & Gori, 2016; Moksnes, Løhre, Byrne, & Haugan, 2014; Neto, 1993; Ortuño-Sierra, Aritio-Solana, Chocarro de Luis, Nalda, & Fonseca-Pedrero, 2019). Internal consistency (coefficient alpha) in this sample was .94. Pavot and Diener (1993) use the scale midpoint from the original 7-point response scale to differentiate higher and lower satisfaction scores; applying that logic to the version of the measure used here, rating each of the 5 items above the midpoint ("somewhat true") on average produces a score of 15, and so we used 15 as the cutpoint to classify participants into higher (15 or higher) versus lower (<15) well-being. The low well-being group constituted 41% of the sample, and the high group 59%.

Psychological symptoms. Symptoms of psychological distress were assessed with 10 items adapted from the Trauma Symptom Checklist-Youth (TSC; Briere, 1996), which include indicators of internalizing problems (e.g., feeling sad, lonely, worried). Internalizing symptoms were assessed because they are relevant for both the youths and adults who participated in the larger study from which this adolescent subsample is drawn. Participants respond on a 4-point scale that ranges from 1 (*never*) to 4 (*almost all the time*). The scale was reverse-scored, with higher scores indicating fewer symptoms. Internal consistency (coefficient alpha) was .90. To determine a cutpoint for classifying participants into high and low on symptoms of psychopathology, we drew on a large, nationally representative data set (NatSCEV; National Survey of Children's Exposure to Violence) that also used the 10-item version of the TSC. The NatSCEV study included over 2,000 children aged 2–17 who were diverse in terms of gender, ethnicity and SES (Finkelhor et al., 2011). We based the cut-off on prevalence estimates of mental health problems in childhood indicating that about 25% of youth experience clinical levels of symptomatology. This estimate is similar to the percentiles used to define clinically significant symptoms in prior studies of the dual factor model (e.g., 25% in Antaramian et al., 2010; 26% Suldo et al., 2016). Consequently, youths scoring below a raw score of 25 on the adapted TSC were categorized as high in psychological distress, and those with a score of 25 or higher were categorized as low in symptomatology. The low distress group constituted 63% of the sample, and the high group 37%.

Protective Factors

We drew on the resilience portfolio model (Grych et al., 2015) to select protective factors to include in the study. To reduce the total number of protective factors analyzed, we included the constructs that Hamby et al. (2018) found were uniquely related to either well-being or psychological symptoms in a recent variable-centered investigation. Individual factors included characteristics that represent the three types of strengths described in the model: *regulatory* strengths, which assess aspects of self-control, were represented by measures of emotional awareness, emotion regulation, and endurance; *interpersonal* strengths, which assess qualities that promote strong relationships, were represented by a measure of generativity; and *meaning-making* strengths, which tap how individuals appraise and make sense of their experiences, were represented by measures of purpose and optimism. External resources were assessed with measures of support from parents, teachers, peers, and the broader community. The following variables were assessed.

Emotional regulation. Emotional regulation was comprised of four items assessing adolescents' ability to manage distressing feelings adapted from the DERS (Gratz & Roemer, 2004). A sample (reverse-scored) item is "When I'm upset, I feel out of control". Internal consistency (coefficient alpha) was .82.

Emotional awareness. Emotional awareness was assessed with two items on the ability to monitor one's own feelings adapted from the DERS (Gratz & Roemer, 2004). A sample item is "I am aware of my feelings". Internal consistency (coefficient alpha) was .82.

The Psychological Endurance Scale. The Psychological Endurance Scale (Hamby, Grych, & Banyard, 2013) used six items to assess one's ability to persevere despite challenges. A sample item is "I am quick to pick myself up when I get 'knocked down'." Internal consistency (coefficient alpha) was 86.

The Purpose Scale. The Purpose Scale includes two items from the Meaning in Life Questionnaire (Steger, Frazier, Oishi, & Kaler, 2006) and one item from the Life Orientation Test (Scheier, Carver, & Bridges, 1994) that assess perceptions that there is a reason for existence. A sample item is "I have a good sense of what makes my life meaningful." Internal consistency (coefficient alpha) was .82.

Optimism. Two items from the Life Orientation Test (Scheier et al., 1994) measure positive expectancies in their lives. A sample item is "I hardly ever expect things to go my way". Internal consistency (coefficient alpha) was .80.

Generativity. Five items were adapted from the Loyola Generativity Scale—Short Form (McAdams & de St. Aubin, 1992) measuring one's concern for helping and promoting the development of others, especially those from younger generations. A sample item is "I like to teach things to people." Internal consistency (coefficient alpha) was .88.

Maternal attachment. Six behavioral indicators of a close and secure relationship with one's mother or mother figure, adapted from the Attachment Behaviors Scale (Furman & Buhrmester, 2009). A sample item is "You seek out your mother (or mother figure) when you're upset." Internal consistency (coefficient alpha) was .93.

Paternal attachment. Parallel items to maternal attachment that ask about one's father or father figure. A sample item is "Your father (or father figure) shows support for the things you do". Internal consistency (coefficient alpha) was .94.

Social support—immediate family. Six items that assess the extent to which individuals' family members serve as

sources of strength and guidance (adapted from Turner, Finkelhor, & Ormrod, 2010; Zimet, Dahlem, Zimet, & Farley, 1988). A sample item is "My family lets me know they care about me". Internal consistency (coefficient alpha) was .88.

Social support—friends and adults. Six items measure the extent to which individuals' friends and nonparent adults serve as sources of strength and guidance (adapted from Turner et al., 2010). A sample item is "I can count on my friends when things go wrong". Internal consistency (coefficient alpha) was .90.

Community support. Nine items assessing the degree to which one's neighbors get along and helps one another (adapted from Sampson, Raudenbush, & Earls, 1997 and from the U.S. Air Force, 2011). A sample item is "People in my neighborhood offer help to one another in times of need." Internal consistency (coefficient alpha) was .87.

Exposure to adversity. Youths in the different mental health classes may differ on their exposure to stress and adversity, and so we assessed their exposure to adversity with the *Juvenile Victimization Questionnaire—Key Domains Short Form,* which includes 21 items assessing lifetime history of a range of interpersonal victimizations (adapted from Hamby, Finkelhor, Ormrod, & Turner, 2004). A sample item is "During your childhood, did one of your parents get hit or pushed by another parent?" Dichotomous items ("yes" or "no") were summed to create a total victimization score.

Correlations among the variables are presented in Table 1.

Results

Formation of Dual Factor Groups

To classify participants into one of the four groups described by the dual factor model, each adolescent received a score of 0 (*low*) or 1 (*high*) on the Satisfaction with Life Scale (well-being) and the Trauma Symptoms Checklist (symptoms). Adolescents who scored high in well-being and low in symptoms comprised the "positive mental health" group (44% of the sample); those who were high in well-being and high in symptoms were classified as "symptomatic but content" (17%); those who were low in well-being and low in symptoms were categorized as "vulnerable" (20%), and participants who were low in well-being and high in symptoms were placed in the "troubled" (19%) group. There were no gender, $F(2, 434) = 1.43$, $p > .05$, age, $F(3, 445) = 1.12$, $p > .05$, or race/ethnic differences in group membership, $F(9, 439) = 16.39$, $p > .05$. The composition of the groups is presented in Table 2.

We also examined whether the groups differed in their exposure to adversity. An analysis of variance showed that significant differences did exist on the JVQ, $F(3, 398) = 31.09$, $p < .01$. Post hoc comparisons using a Bonferroni correction showed that youths in the troubled group ($M = 9.54$) reported significantly higher levels of adversity than any other group. Those in the symptomatic but content group ($M = 6.71$) reported significantly more adversity than those in the positive mental health ($M = 3.96$) and vulnerable groups ($M = 5.30$), who did not differ from each other.

We then assessed group differences in scores on the measures of well-being and symptoms; given the group differences in exposure to adversity, scores on the JVQ were included as a covariate. First, the groups differed significantly on well-being, $F(3, 406) = 158.86$, $p < .01$, partial eta squared = .54. Post hoc comparisons using a Bonferroni correction showed that the two groups characterized by high levels of well-being (positive mental health and symptomatic but content) did not differ significantly in their mean scores on the Satisfaction with Life Scale ($M = .71$ sd = .43; $M = .50$, sd = .51, respectively), and both were higher than the groups characterized by low well-being (vulnerable, troubled). The troubled group ($M = -1.17$, $SD = .98$) reported significantly lower well-being than did the vulnerable group ($M = -.60$, $SD = .76$). The groups also differed on the measure of Symptoms, $F(3, 406) =$

Table 1. *Correlations Among Study Variables*

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. SubWB														
2. Distress	.29													
3. Em Aware .46	.21													
4. Em Reg	.18	.53	.02											
5. Endure	.57	.11	.44	.04										
6. Purpose	.69	.24	.45	.15	.60									
7. Optimism	.01	.31	−.07	.32	−.18	−.03								
8. Generativity	.53	.06	.42	.00	.72	.57	−.15							
9. FamSup	.55	.27	.56	.10	.49	.53	−.04	.44						
10. PeerSup	.46	.16	.53	.00	.49	.47	−.18	.49	.67					
11. ComSup	.34	.14	.25	.14	.27	.30	.03	.27	.39	.27				
12. MatAtt	.50	.16	.44	.06	.42	.48	−.01	.37	.67	.53	.32			
13. PatAtt	.31	.16	.27	.13	.24	.23	−.06	.20	.39	.26	.24	.39		
14. JVQ	−.24	−.49	−.29	−.35	−.10	−.20	−.17	−.00	−.41	−.26	−.22	−.29	−.24	
15. Age	−.11	−.08	.00	.08	−.08	−.09	.01	−.01	−.04	.02	−.05	−.09	−.14	.03

Note. Correlations > .10 are significant at $p < .05$. SubWB = subjective well-being; Distress = symptoms of psychological distress; Em Aware = emotional awareness; Em Rg = emotion regulation; Endure = endurance; FamSup = family support; PeerSup = peer support; ComSup = community support; MatAtt = maternal attachment; PatAtt = paternal attachment; JVQ = exposure to adversity.

Table 2. *Composition of Dual Factor Groups*

	Well-being	
Symptoms	High	Low
Low	Positive mental health (n = 163; 44%)	Vulnerable (n = 68; 19%)
High	Symptomatic but content (n = 63; 17%)	Troubled (n = 73; 20%)

259.94, $p < .01$, partial eta squared = .66. Post hoc comparisons using a Bonferroni correction showed that the two high symptom groups (symptomatic but content, troubled) differed significantly from each other ($M = -1.22$, $SD = .49$; $M = -1.33$, $SD = .57$, respectively), and reported more symptoms than did the positive mental health and vulnerable groups. The latter two groups were not significantly different ($M = .53$, $SD = .57$; $M = .42$, $SD = .57$, respectively).

Differences in Individual Strengths Among Groups

We tested whether the groups differed significantly on the protective factors by conducting a multivariance analysis of covariance (MANCOVA) in which group (positive mental health, symptomatic but content, vulnerable, troubled) was the independent variable, the individual strengths and external resources were the dependent variables, and scores on the JVQ were included as a covariate. The MANCOVA for individual strengths revealed significant multivariate main effects for both group membership, $F(11, 352) = 9.22$, $p < .01$, and exposure to adversity, $F(11, 352) = 7.15$, $p < .01$.

Differences among groups on specific strengths then were examined with ANCOVA, with exposure to adversity included as a covariate. These analyses showed that significant main effects of group membership were found for all strengths: emotional awareness, $F(3, 385) = 19.78$, $p < .01$, partial eta squared = .14; emotional regulation, $F(3, 385) = 23.38$, $p < .01$, partial eta squared = .16; endurance, $F(3, 385) = 37.09$, $p < .01$, partial eta squared = .23; purpose, $F(3, 385) = 57.12$, $p < .01$, partial eta squared = .31; optimism, $F(3, 385) = 10.34$, $p < .01$, partial eta squared = .08; and generativity, $F(3, 385) = 36.81$, $p < .01$, partial eta squared = .23. Means are displayed in Table 3 and graphically in Figure 1. Pairwise comparisons were conducted to determine which groups differently significantly. In four of the six analyses (emotional awareness, endurance, purpose, generativity), the scores of youths in the positive mental health group did not differ from those in the symptomatic but content group, and both were higher than the vulnerable and troubled groups, who did not differ from each other. Emotion regulation showed a different pattern: the positive mental health group reported the highest levels, followed by the vulnerable group, who reported higher levels of emotion regulation than the symptomatic but content and troubled groups, who did not differ from each other. Finally, the positive mental health and vulnerable groups did not differ on optimism, and both were higher than the symptomatic but content and vulnerable groups, who did not differ from each other.

Differences in External Resources Among Groups

Next, we conducted a MANCOVA on the variables representing external resources (family support, support from friends/other adults, community support, maternal attachment, paternal attachment) with participants' scores on the JVQ as a covariate. There were significant multivariate main effects for both group membership, $F(11, 352) = 9.22$, $p < .01$, and exposure to adversity, $F(11, 352) = 7.15$, $p < .01$.

Differences among groups on specific resources were further examined with analysis of covariance, with exposure to adversity included as a covariate. Significant main effects of group membership were found for all sources of support: community support, $F(3, 391) = 10.15$, $p < .01$, partial eta squared = .07; peer support, $F(3, 391) = 16.45$, $p < .01$, partial eta squared = .11; family support, $F(3, 391) = 36.50$, $p < .01$, partial eta squared = .22; maternal attachment, $F(3, 391) = 32.19$, $p < .01$, partial eta squared = .20; and paternal attachment, $F(3, 391) = 8.61$, $p < .01$, partial eta squared = .06. Group means are presented in Table 4 and displayed graphically in Figure 2. Pairwise comparisons were conducted to determine which groups differently significantly. These analyses showed that the two groups with high levels of well-being (positive mental health, symptomatic but content) consistently reported similar levels of environmental resources that were significantly higher than the two groups reporting low levels of well-being (vulnerable, troubled). In all but one analysis, the vulnerable and troubled groups did not differ significantly. The only exception occurred on family support, with the vulnerable group reporting higher levels than the troubled group.

Table 3. *Adjusted Group Means and Standard Deviations of Individual Strengths*

	Strengths					
Group	EmAware	EmReg	Endure	Purpose	Optimism	Generative
PMH	.49[a] (.08)	.53[a] (.07)	.51[a] (.07)	.65[a] (.23)	.33[a] (.07)	.26[a] (.07)
SBC	.28[a] (.13)	−.46[c] (.11)	.49[a] (.11)	.50[a] (.11)	−.23[b] (.12)	.25[a] (.11)
Vulnerable	−.35[b] (.13)	.20[b] (.11)	−.48[b] (.11)	−.45[b] (.11)	.29[a] (.12)	−.41[b] (.11)
Troubled	−.60[b] (.12)	−.30[c] (.10)	−.50[b] (.10)	−.69[b] (.10)	−.39[b] (.11)	−.20[b] (.11)

Note. PMH = positive mental health; SBC = symptomatic but content. Means in the same column with different superscripts differ at $p < .05$. Values presented in the table are z scores.

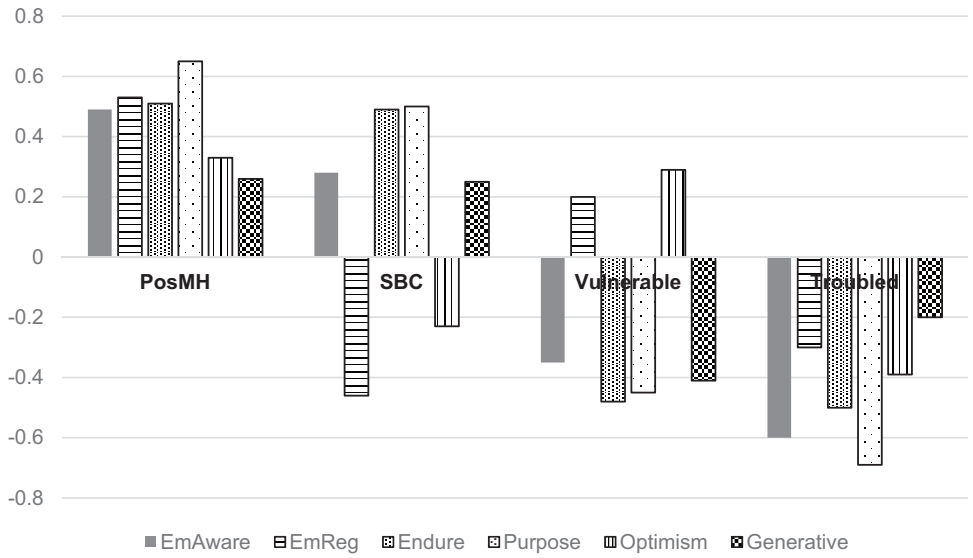

Figure 1. Scores on individual strengths in the dual factor groups.

Discussion

Adopting a broader view of mental health that includes the presence of well-being in addition to low levels of psychopathology more fully captures youths' social and emotional functioning and has the potential to identify protective factors that promote healthy functioning. This study builds on prior research utilizing the dual factor model by investigating whether individual strengths and external resources highlighted in the resilience portfolio model distinguished groups of adolescents who differed on indicators of well-being and psychological symptomatology. We found that youths reporting different patterns of well-being and psychological symptoms showed different "portfolios" of protective factors, some of which have received little attention in resilience research. The most consistent differences were found between the groups who differed in well-being rather than those differing in symptoms; if our assessment of mental health had been limited to symptoms (like many prior studies of resilience), the findings would have looked quite different. These data thus provide a more nuanced perspective on the association between psychological health and the assets and resources proposed to promote resilience.

On most of the measures of individual strengths, the two high well-being groups differed significantly from the two low well-being groups. Youths in the positive mental health and symptomatic but content groups reported similar levels of emotional awareness, endurance, generativity and purpose, and were significantly higher on these strengths than youths in the vulnerable and troubled groups, who did not differ from each other. Although the causal direction of these associations cannot be determined from cross-sectional data, they suggest that these qualities may promote healthy functioning in adolescents exposed to adversity by increasing well-being rather than reducing symptoms. Emotional awareness, or being attuned to one's emotions, helps individuals to better understand themselves and the effects of experiences on them and thus guides adaptive behavior in difficult circumstances. Endurance, which reflects the capacity to persevere despite challenges, could help youths effectively work toward and attain their goals, which in turn is likely to enhance their well-being. Generativity historically has been conceptualized as a characteristic that does not become prominent until later in adulthood, but youths in this sample who reported shared their knowledge and skills to help others also reported greater well-being, perhaps because helping others enhances individuals' interpersonal relationships and fosters a more positive sense of self (Grych et al., 2015). Finally, having a clear sense of purpose can provide meaning and direction and, together with the capacity to remain focused and motivated over time, may increase the probability that youths will be successful in achieving goals that they value even in the face of adversity.

Table 4. *Adjusted Group Means and Standard Deviations on External Resources*

Group	Family supp.	Peer supp.	Comm. supp.	Maternal att.	Paternal att.
PMH	.56[a] (.06)	.35[a] (.06)	.35[a] (.07)	.40[a] (.06)	.23[a] (.08)
SBC	.35[a] (.09)	.30[a] (.10)	.18[a] (.11)	.44[a] (.09)	.35[a] (.12)
Vulnerable	−.17[b] (.10)	−.27[b] (.10)	−.25[b] (.11)	−.24[b] (.10)	−.07[b] (.12)
Troubled	−.76[c] (.09)	−.38[b] (.09)	−.30[b] (.10)	−.61[b] (.09)	−.51[b] (.11)

Note. PMH = positive mental health; SBC = symptomatic but content; supp. = support; att. = attention. Means in the same column with different superscripts differ at $p < .05$. Values presented in the table are z scores.

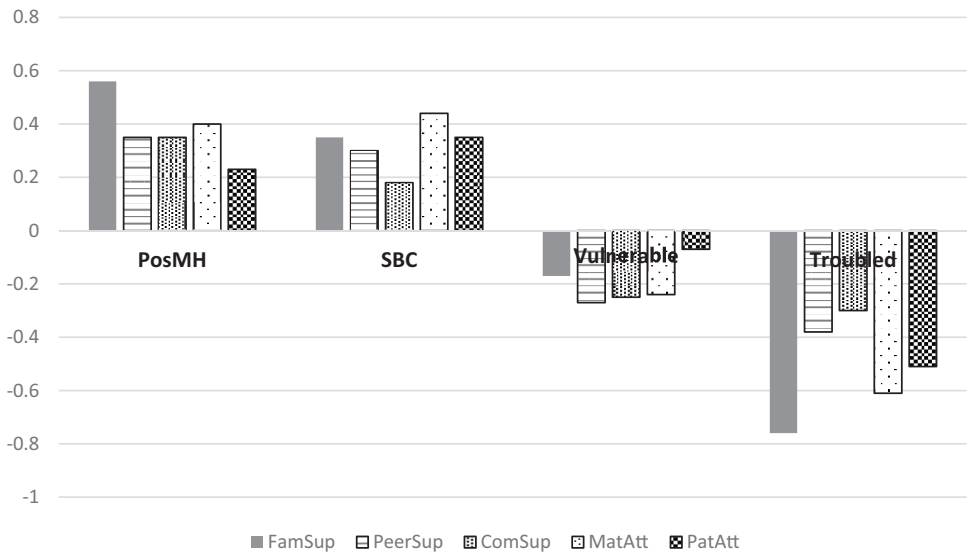

Figure 2. Scores on external resources in the dual factor groups.

The other two individual strengths primarily distinguished groups of youths who differed in symptomatology rather than well-being. The positive mental health group reported the highest levels of emotion regulation, followed by the vulnerable group, and both of these groups (which shared low levels of symptoms) were higher than the symptomatic but content and troubled groups, who did not differ. The positive mental health and vulnerable groups reported similar levels of optimism that were higher than the symptomatic but content and troubled groups (who did not differ from each other). Emotion regulation is linked with a variety of mental health disorders and these data suggest that better emotion regulation is particularly important for reducing or preventing mood disorders. Similarly, although high levels of optimism can promote initiative and sustained effort toward individuals' goals, these data support the finding that pessimistic thinking is a risk factor for anxiety and depression (e.g., Robinson-Whelen, Kim, MacCallum, & Kiecolt-Glaser, 1997).

Measurement factors also may have played a role in these findings. The scale used to assess emotion regulation focuses on unpleasant emotions and so may be a better indicator of how individuals manage emotions like anxiety than pleasant emotions. The ability to generate and sustain emotions like happiness and curiosity also is valuable for fostering interpersonal relationships, creativity, and achievement goals (e.g., Fredrickson, 2001; Layous, Chancellor, & Lyubomirsky, 2014; Zautra, Affleck, Tennen, Reich, & Davis, 2005), and a scale that assesses the capacity to upregulate pleasant emotions may show a stronger relationship with well-being. Similarly, the measure of optimism used in the present study emphasizes the pessimistic end of that construct (e.g., "if something can go wrong for me, it will") and including more items that tap optimistic thinking might better predict well-being.

Social support in different relationships also primarily distinguished the two groups high in well-being from the two groups that were low in well-being. The only exception was support from family, where the vulnerable group reported a higher level of support than the troubled group. These analyses thus replicated and extended the findings of prior studies of protective factors in children classified into the dual factor groups (Antaramian et al., 2010; Magalhães & Calheiros, 2017; Suldo & Schaffer, 2008) and adds to growing evidence that social support is more closely tied to well-being than to psychological distress. Supportive family relationships are one of the most consistent predictors of resilience in children exposed to violence (Yule et al., 2019), and these results suggest that lack of family support is linked to both increased symptoms of psychopathology and lower well-being, while support from family, friends and the community more broadly all are more specifically related to greater well-being.

These findings highlight the value of assessing indicators of healthy functioning in addition to psychopathology for understanding resilience. Had we assessed only symptoms of psychopathology, youths in the positive mental health and vulnerable groups would have been combined because both reported lower levels of symptoms than the other two groups. However, although they reported similar levels of adversity, the positive mental health group consistently reported higher levels of protective factors. Similarly, the symptomatic but content and troubled groups would have been combined because they shared higher levels of symptoms, which would have obscured consistent differences in individual strengths and external resources. These findings are particularly telling in light of the groups' differential exposure to adversity. For example, despite experiencing higher levels of adversity, the symptomatic but content group had higher well-being than the vulnerable group, which may have been due to having a more robust portfolio of protective factors.

The results of this study also are consistent with the covitality model (Furlong, You, Renshaw, Smith, & O'Malley, 2014; Jones, You, & Furlong, 2013), which holds that individual strengths and sources of support tend covary and combine to promote mental health. Like the resilience portfolio model, the covitality framework identifies internal and external factors linked to healthy functioning, including emotional regulation, optimism and peer

support. The models also share the principle that the total number of protective or promotive factors (referred to as "building blocks" in the covitality model) is important for fostering health and well-being. However, the Resilience Portfolio Model goes on to propose specific pathways by which strengths promote resilience. Given that higher well-being is associated with other indices of healthy functioning after accounting for symptoms (Antaramian et al., 2010; Lyons et al., 2013; Suldo & Schaffer, 2008), identifying protective factors that are uniquely related to well-being offers directions for promoting resilience in youths exposed to adversity. This study suggests that promoting positive social connections, increasing youths' emotional awareness, and giving them opportunities to pursue a sense of purpose and to give back to others can enhance well-being. To decrease or prevent mental health symptoms, a focus on optimism, perhaps through cognitive reframing or narrative exercises, and building emotion regulation skills may be beneficial.

An important next step would be to test these associations in longitudinal research and to investigate *how* strengths associated with different patterns of health are related to functioning. The resilience portfolio model (Grych et al., 2015) describes three processes through which protective factors impact health: shaping individuals' exposure to stressful situations, directly promoting well-being, and buffering the effects of adversity by influencing how individuals perceive and respond to stressful events. For example, examining if youths who are high in optimism or sense of purpose appraise difficult situations more positively or engage in more constructive coping would test the buffering pathway described in the model. The model also incorporates reciprocal effects of healthy functioning on individuals' strengths and resources, suggesting, for example, that mastering salient developmental tasks may foster the development of greater endurance or build stronger relationships with others.

Limitations

Cross-sectional data do not provide evidence for the causal relationships among variables, and consequently we cannot conclude that particular protective factors enhanced youths' well-being or decreased symptoms. It is possible that the causal effect flows in the other direction—for example, experiencing greater well-being may promote greater endurance—and longitudinal research will be needed to determine if these hypothesized protective factors actually lead to better mental health. Second, all of the data come from a single reporter, which provides a limited perspective on adolescents' health and well-being and raises the possibility that monomethod variance could contribute to associations documented among the constructs. Third, although this sample from Appalachia represents an understudied group, the results may not generalize beyond this population. Finally, because participants were recruited at community events, though ads, and via word of mouth, it is not possible to compute the percentage of participants who were invited to participate who actually took part in the study.

Conclusion

By conceptualizing mental health in terms of both well-being and symptomatology, these findings provide a more comprehensive picture of protective factors related to adaptive functioning in adolescence. They extend prior research documenting differences among the dual factor groups in academic and social domains and suggest that enhancing particular internal assets and external resources can promote resilience by improving well-being.

Keywords: resilience; protective factors; mental health; adolescence

References

Antaramian, S. P., Huebner, E. S., Hills, K. J., & Valois, R. F. (2010). A dual-factor model of mental health: Toward a more comprehensive understanding of youth functioning. *American Journal of Orthopsychiatry, 80,* 462–472. http://dx.doi.org/10.1111/j.1939-0025.2010.01049.x

Banyard, V., Hamby, S., & Grych, J. (2017). Health effects of adverse childhood events: Identifying promising protective factors at the intersection of mental and physical well-being. *Child Abuse & Neglect, 65,* 88–98. http://dx.doi.org/10.1016/j.chiabu.2017.01.011

Briere, J. (1996). *Trauma Symptom Checklist: Professional manual*. Odessa, FL: Psychological Assessment Resources.

Cicchetti, D., & Rogosch, F. A. (2002). A developmental psychopathology perspective on adolescence. *Journal of Consulting and Clinical Psychology, 70,* 6–20. http://dx.doi.org/10.1037/0022-006X.70.1.6

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112,* 155–159. http://dx.doi.org/10.1037/0033-2909.112.1.155

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction With Life Scale. *Journal of Personality Assessment, 49,* 71–75. http://dx.doi.org/10.1207/s15327752jpa4901_13

Di Fabio, A., & Gori, A. (2016). Measuring Adolescent Life Satisfaction: Psychometric Properties of the Satisfaction With Life Scale in a Sample of Italian Adolescents and Young Adults. *Journal of Psychoeducational Assessment, 34,* 501–506. http://dx.doi.org/10.1177/0734282915621223

Finkelhor, D., Turner, H., Hamby, S. L., & Ormrod, R. (2011). *Polyvictimization: Children's exposure to multiple types of violence, crime, and abuse*. Washington, DC: US Government Printing Office.

Fredrickson, B. L. (2001). The role of positive emotions in positive psychology. The broaden-and-build theory of positive emotions. *American Psychologist, 56,* 218–226. http://dx.doi.org/10.1037/0003-066X.56.3.218

Furlong, M. J., You, J., Renshaw, T. L., Smith, D. C., & O'Malley, M. D. (2014). Preliminary development and validation of the Social and Emotional Health Survey for Secondary School Students. *Social Indicators Research, 117,* 1011–1032. http://dx.doi.org/10.1007/s11205-013-0373-0

Furman, W., & Buhrmester, D. (2009). The Network of Relationships Inventory: Behavioral Systems Version. *International Journal of Behavioral Development, 33,* 470–478. http://dx.doi.org/10.1177/0165025409342634

Gore, J. S., Sheppard, A., Waters, M., Jackson, J., & Brubaker, R. (2016). Cultural differences in seeking mental health counseling: The role of symptom severity and type in Appalachian Kentucky. *Rural Mental Health, 40,* 63–76. http://dx.doi.org/10.1037/rmh0000041

Gratz, K. L., & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the difficulties in emotion regulation scale. *Journal of Psychopathology and Behavioral Assessment, 26,* 41–54. http://dx.doi.org/10.1023/B:JOBA.0000007455.08539.94

Greenspoon, P. J., & Saklofske, D. H. (2001). Toward and integration of subjective well-being and psychopathology. *Social Indicators Research, 54,* 81–108. http://dx.doi.org/10.1023/A:1007219227883

Grych, J., Hamby, S., & Banyard, V. (2015). The resilience portfolio model: Understanding healthy adaptation in victims of violence. *Psychology of Violence, 5,* 343–354. http://dx.doi.org/10.1037/a0039671

Hamby, S., Finkelhor, D., Ormrod, R., & Turner, H. (2004). *The Juvenile Victimization Questionnaire (JVQ): Administration and scoring manual*. Durham, NH: Crimes Against Children Research Center.

Hamby, S., Grych, J., & Banyard, V. L. (2013). *Life paths research measurement packet*. Sewanee, TN: Life Paths Research Program.

Hamby, S., Grych, J., & Banyard, V. (2018). Resilience portfolios and poly-strengths: Identifying protective factors associated with thriving after adversity. *Psychology of Violence, 8,* 172–183. http://dx.doi.org/10.1037/vio0000135

Holmbeck, G. N., Friedman, D., Abad, M., & Jandasek, B. (2006). Development and psychopathology in adolescence. In D. A. Wolfe & E. J. Mash (Eds.), *Behavioral and emotional disorders in adolescents: Nature, assessment, and treatment* (pp. 21–55). New York, NY: Guilford Press Publications.

Howell, K., Coffey, J., Fosco, G., Kracke, K., Nelson, S. K., Rothman, E., & Grych, J. (2016). Seven reasons to invest in well-being. *Psychology of Violence, 6,* 8–14. http://dx.doi.org/10.1037/vio0000019

Jones, C. N., You, S., & Furlong, M. J. (2013). A preliminary examination of covitality as integrated well-being in college students. *Social Indicators Research, 111,* 511–526. http://dx.doi.org/10.1007/s11205-012-0017-9

Keyes, C. L. M. (2005). Mental illness and/or mental health? Investigating axioms of the complete state model of health. *Journal of Consulting and Clinical Psychology, 73,* 539–548. http://dx.doi.org/10.1037/0022-006X.73.3.539

Keyes, C. L. M. (2007). Promoting and protecting mental health as flourishing: A complementary strategy for improving national mental health. *American Psychologist, 62,* 95–108. http://dx.doi.org/10.1037/0003-066X.62.2.95

Layous, K., Chancellor, J., & Lyubomirsky, S. (2014). Positive activities as protective factors against mental health conditions. *Journal of Abnormal Psychology, 123,* 3–12. http://dx.doi.org/10.1037/a0034709

Lecci, L., Okun, M. A., & Karoly, P. (1994). Life regrets and current goals as predictors of psychological adjustment. *Journal of Personality and Social Psychology, 66,* 731–741. http://dx.doi.org/10.1037/0022-3514.66.4.731

Lyons, M. D., Huebner, E. S., & Hills, K. J. (2013). The dual-factor model of mental health: A short-term longitudinal study of school-related outcomes. *Social Indicators Research, 114,* 549–565. http://dx.doi.org/10.1007/s11205-012-0161-2

Magalhães, E., & Calheiros, M. M. (2017). A dual-factor model of mental health and social support: Evidence with adolescents in residential care. *Children and Youth Services Review, 79,* 442–449. http://dx.doi.org/10.1016/j.childyouth.2017.06.041

McAdams, D. P., & de St. Aubin, E. (1992). A theory of generativity and its assessment through self-report, behavioral acts, and narrative themes in autobiography. *Journal of Personality and Social Psychology, 62,* 1003–1015. http://dx.doi.org/10.1037/0022-3514.62.6.1003

Moksnes, U. K., Løhre, A., Byrne, D. G., & Haugan, G. (2014). Satisfaction with Life Scale in Adolescents: Evaluation of factor structure and gender invariance in a Norwegian sample. *Social Indicators Research, 118,* 657–671. http://dx.doi.org/10.1007/s11205-013-0451-3

Neto, F. J. (1993). The satisfaction with life scale: Psychometrics properties in an adolescent sample. *Journal of Youth and Adolescence, 22,* 125–134. http://dx.doi.org/10.1007/BF01536648

Ortuño-Sierra, J., Aritio-Solana, R., Chocarro de Luis, E., Nalda, F., & Fonseca-Pedrero, E. (2019). Subjective well-being in adolescence: New psychometric evidences on the satisfaction with life scale. *European Journal of Developmental Psychology, 16,* 236–244. http://dx.doi.org/10.1080/17405629.2017.1360179

Pavot, W., & Diener, E. (1993). Review of the Satisfaction with Life Scale. *Psychological Assessment, 5,* 164–172. http://dx.doi.org/10.1037/1040-3590.5.2.164

Robinson-Whelen, S., Kim, C., MacCallum, R. C., & Kiecolt-Glaser, J. K. (1997). Distinguishing optimism from pessimism in older adults: Is it more important to be optimistic or not to be pessimistic? *Journal of Personality and Social Psychology, 73,* 1345–1353. http://dx.doi.org/10.1037/0022-3514.73.6.1345

Sampson, R. J., Raudenbush, S. W., & Earls, F. (1997). Neighborhoods and violent crime: A multilevel study of collective efficacy. *Science, 277,* 918–924. http://dx.doi.org/10.1126/science.277.5328.918

Scheier, M. F., Carver, C. S., & Bridges, M. W. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): A reevaluation of the Life Orientation Test. *Journal of Personality and Social Psychology, 67,* 1063–1078. http://dx.doi.org/10.1037/0022-3514.67.6.1063

Seligman, M. E. P. (2005). The positive perspective on youth development. In D. L. Evans, E. B. Foa, R. E. Gur, H. Hendin, C. P. O'Brien, M. E. P. Seligman, & B. T. Walsh (Eds.), *Treating and preventing adolescent mental health disorders: What we know and what we don't know* (pp. 498–527). New York, NY: Oxford University Press.

Steger, M. F., Frazier, P., Oishi, S., & Kaler, M. (2006). The Meaning in Life Questionnaire: Assessing the presence of and search for meaning in life. *Journal of Counseling Psychology, 53,* 80–93. http://dx.doi.org/10.1037/0022-0167.53.1.80

Suldo, S. M., & Schaffer, E. J. (2008). Looking beyond psychopathology: The dual-factor model of mental health in youth. *School Psychology Review, 37,* 52–68.

Suldo, S. M., Thalji-Raitano, A., Kiefer, S. M., & Ferron, J. M. (2016). Conceptualizing high school students' mental health through a Dual-Factor Model. *School Psychology Review, 45,* 434–457. http://dx.doi.org/10.17105/SPR45-4.434-457

Turner, H. A., Finkelhor, D., & Ormrod, R. (2010). Poly-victimization in a national sample of children and youth. *American Journal of Preventive Medicine, 38,* 323–330. http://dx.doi.org/10.1016/j.amepre.2009.11.012

U.S. Air Force. (2011). *2011 Air Force Community Assessment Survey: Survey data codebook*. Lackland Air Force Base, TX: Author.

Woodard, C. (2011). *American nations: A history of the eleven rival regional cultures of North America*. New York, NY: Penguin.

Yule, K., Houston, J., & Grych, J. (2019). Resilience in children exposed to violence: A meta-analysis of protective factors across ecological contexts. *Clinical Child and Family Psychology Review, 22,* 406–431. http://dx.doi.org/10.1007/s10567-019-00293-1

Zautra, A. J., Affleck, G. G., Tennen, H., Reich, J. W., & Davis, M. C. (2005). Dynamic approaches to emotions and stress in everyday life: Bolger and Zuckerman reloaded with positive as well as negative affects. *Journal of Personality, 73,* 1511–1538. http://dx.doi.org/10.1111/j.0022-3506.2005.00357.x

Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The multidimensional scale of perceived social support. *Journal of Personality Assessment, 52,* 30–41. http://dx.doi.org/10.1207/s15327752jpa5201_2