

THE POSITIVE EMOTION REGULATION QUESTIONNAIRE AND THE
ASSESSMENT OF STRATEGY USE PROFILES AS PREDICTORS
OF MENTAL HEALTH OUTCOMES

by

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DEDICATION

This product is dedicated to Patrick and Anu, I couldn't have done it without you.

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To my committee,

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ABSTRACT

Past research has shown that experiencing and upregulating positive emotions may be beneficial for youths' well-being (Martin-Krumm, 2018; Young et al., 2019). Further, research with negative ER suggests having a wider range of strategies enhances ER success (Lougheed & Hollenstein, 2012). However, most studies on positive emotion regulation (ER) have focused on savoring strategies and lack youth involvement. I propose that it is not only how many strategies youth use but the pattern of strategies youth use to regulate positive emotions that relate to internalizing problems. The purpose of our study was to examine the factor structure of a novel self-report measure of positive ER strategies in adolescents and their relations to mental health as well as to investigate the number and type of profiles that emerge from youths' use of 13 positive ER strategies and differences in mental health. I recruited a sample of 349 English-speaking 13-17-year-old youth (50% females; 32% non-binary/other gender; $M_{age} = 15.7$) who reported on positive ER strategies, anxiety, depression, difficulties regulating positive emotions, resilience, and trauma. Exploratory factor analysis of the measure indicated 10 factors. Correlations showed greater use of Self-Improvement, Physical Activity, and Positive Thinking were related to more resilience; greater use of Fantasizing and Sensation Seeking were related to more anxiety; and greater use of Sensation Seeking and Relaxation were related to more depression. Conversely, greater use of Sensation Seeking was related to less resilience; greater use of Positive Thinking was related to less anxiety; and greater use of Positive Thinking and Physical activity were related to less depression. Profile analysis revealed a 6-profile model with two unique profiles characterized by either mainly using personal growth strategies more frequently than other strategies (profile 3) or using more frequently sensation seeking and fantasizing as opposed to other strategies available to them (profile 4). ANOVA results revealed significant differences in depression among profiles. These findings demonstrate adolescents utilize a wide range of emotion regulation strategies to maintain and upregulate positive emotions. Further, certain positive ER profiles may indicate protective (high personal growth only) or risk (high sensation seeking and fantasizing) for experiencing depressive symptoms.

INTRODUCTION

“Action may not always bring happiness, but there is not happiness without action”

- William James

The study of emotion regulation in children and adolescents has elucidated much regarding mental health, resilience, social competence, and developmental trajectories (Berking et al., 2008; Compas et al., 2014; Zeman et al., 2006). However, most of this work has focused on understanding the influence of negative emotion regulation on both physical and mental health outcomes and less emphasis on the role of positive emotion regulation. This is surprising given empirical findings suggest associations between the upregulation and maintenance of positive emotions and well-being in youth and adults (Livingstone et al., 2012). We have limited information regarding how youth maintain and regulate their positive emotions through specific cognitive, behavioral, or physiological strategies despite the potential implications of experiencing positive emotions. One possible reason for scant research in this area in youth is the lack of a reliable and valid assessment tool of positive emotion regulation. My proposed study will aim to close this gap in the literature by expanding upon my previous work on adapting an emotion regulation questionnaire for adolescents and investigating its reliability and validity in a sample of 300 adolescents (ages 13-17 years). In the following sections, I will provide a brief review of emotion regulation in adolescence, the significance of experiencing and regulating positive emotions during adolescence, how positive emotion regulation is currently assessed, and how this study will address limitations in the field.

Emotion Regulation

Emotion is a cognitive (e.g., subjective feeling of fear), behavioral (e.g., fearful facial expression), or physiological (e.g., increased heart rate) response to an event or situation (internal or external). Emotions contextualize and give meaning to experiences (Cole et al., 2004) and occur in response to events appraised as significant in response to needs being met or unmet (Gendron and Barrett, 2009; Frijda, 1986). One system for categorizing emotional experiences is with discrete emotions. Discrete emotions include fear, sadness, happiness, surprise, anger, and disgust and are composed of appraisals and behavioral, cognitive, and physiological reactions. Specifically, following an affective experience (i.e., pleasure or displeasure), the experience is categorized and labeled to assist people in making sense of their experiences and achieving their goals.

Emotion regulation is the extrinsic and intrinsic, implicit and explicit, modulation of positive and negative emotional experiences and expressions at the biological, cognitive, and behavioral levels to achieve a personal goal. Two distinctions to make when discussing emotion regulation are what is being regulated and how that regulation is occurring. Emotion regulation occurs at both the cognitive, physiological, and behavioral levels and can impact the emotions themselves (i.e., from anger to happiness) and/or the intensity, duration, or outcome of the emotion (Thompson, 1994). Most models of emotion regulation are influenced by Gross's model process model (Gross, 2013), which posits that emotion regulation occurs as follows: situation selection, situation modification, attention, cognitive change, and response modulation. The strategies used to regulate emotions depend on where in the process emotion regulation occurs. The focus of the primary investigation revolves around explicit or effortful regulation.

Emotion Regulation Development in Adolescence

Emotion regulation requires an integration of social, cognitive, and biological systems such that emotional and social experiences rely on one another for meaning, cognitive development allows for a greater understanding of social and emotional contexts, and underlying these abilities is neurobiological development (Zeman et al., 2006). The development of emotion regulation processes begins during infancy and continues through early adulthood.

In the past, emotion development was considered a linear process, improving over time; however, the past few decades have demonstrated adolescence to be a unique developmental period for emotion regulation development (Ahmed et al., 2015; Cracco et al., 2017).

Biologically, adolescence is a time of heightened plasticity and pruning of limbic and prefrontal regions of the brain (Ahmed et al., 2015). A widely accepted belief regarding emotion dysregulation in adolescence has been that heightened dysregulation occurs due to a limbic-pre-frontal maturity mismatch (Ahmed et al., 2015). However, modern research on the role of hormones and pubertal changes as related to affect has highlighted that the causes of heightened emotion dysregulation are more complex. Specifically, hormones begin a cascade of emotion-related changes in adolescence such that hormones impact the limbic system, which impacts social and affective processing, which impacts cognitive control, which leads to emotion regulation flexibility (Ahmed et al., 2015).

Socially, adolescents' experiences outside of the family increase in frequency and intensity as they engage in a wider variety of types of relationships. As a result, they experience new changes and with these changes come new pressures and stress such that coping and regulation of emotional experiences alongside stress is critical. Moreover, adolescents also

experience an increase in self-conscious emotions, which adds to the growing complexity of their social worlds (Zeman et al., 2006). Furthermore, adolescents continue to learn to regulate their emotions in a way that aligns with sociocultural norms which aid in social competence (Riediger & Klipker, 2014). Social competence is critical in the success of relationships, academics, and emotional well-being, and the emotion regulation strategies youth use to regulate social-related emotions have strong implications for social competence (Zeman et al., 2006).

Cognitively, working memory capacity, inhibitory control, abstract thought, decision making, and perspective-taking abilities increase during adolescence (Ahmed et al., 2015). Adolescents are adept at regulating their emotions in contexts with low ambiguity and as they develop, they are better able to regulate during ambiguous situations. Emotion regulation becomes more reliant on personal motivation, emotion type, and social context surrounding the emotional experience (Riediger & Klipker, 2014). Compared to both adults and children, adolescents react faster to emotional information and engage in more contra-hedonic regulation or thoughts and behaviors that are antithetical to positive emotions (Riediger & Klipker, 2014; Tottenham et al., 2011). Further, as adolescents develop, in addition to relying on more cognitive strategies, adolescents begin to use more antecedent-focused strategies (regulating before experiencing the emotions) rather than response-focused strategies. Specifically, in times of stress, they learn to rely more on planning and problem solving and are better able to use

In sum, in adolescence, emotion regulation becomes more dependent on emotion type and intensity, emotion context, consequences of emotions, and personal goals and motivations. The groundwork for emotion regulation begins early on and has implications for protecting individuals from negative stress-related consequences (resilience) (Cole et al., 1994; Compas et

al., 2014). However, difficulties regulating emotions can also put some youth at higher risk for mental illness (Ahmed et al., 2015). Historically, research has emphasized a linear development of emotion regulation, implying a gradual improvement of skill over time. However, evidence suggests the presence of a maladaptive shift in emotion regulation in adolescence due to biological, cognitive, and social pressures (Cracco et al., 2017). Moreover, there are observed reductions in the volume of experiences of positive emotions and increases in the volume of negative emotions (Gomez-Baya et al., 2018; Martin-Krumm, 2018). Further, the majority of information regarding emotion regulation and effective emotion regulation strategies and mental health revolves around the downregulation of negative emotions.

Preliminary Qualitative Study and Next Steps

I conducted a preliminary qualitative study (McCullen et al., 2022) to 1) assess the range of emotion regulation strategies utilized in a sample of 24 adolescents and 2) use this data to adapt an established emotion regulation questionnaire as a self-report for adolescents. My literature review for that study showed that extant adolescent measures suffer from a limited representation of strategies, focus on the capacity for emotional regulation vs. dysregulation, focus mainly on negative emotions, lack inclusion of physical and cultural/spiritual strategies, limited qualitative methodology in assessment development, limited involvement of adolescents in the assessment development process. The primary objective was to fill these gaps by adapting the Emotion Regulation Skills Questionnaire (ERSQ; Scott, 2014), a parent-report children's measure of 16 emotion regulation strategies for both positive and negative discrete emotions (excited, fear, anger, and sadness), as an adolescent self-report. I utilized cognitive interviewing

with a hybrid think-aloud and concurrent probing procedure across two rounds (i.e., I made modifications to the ERSQ before round 2; Willis, 2011) with 24 youths between 13 and 17 years of age. One specific and interesting finding in our first round of interviews was that youth conveyed that they did not seek to down-regulate positive emotions but rather seek to maintain or upregulate them. At this stage in development, it is reasonable to assume that youth are better able to temper excitement compared to their child counterparts, however, what this finding helped highlight was the sheer lack of questionnaires that assess for positive emotion maintenance or upregulation. After a cursory literature review, I selected 9 strategies (savoring, socializing, substance use, eating, fantasizing, self-improvement, goal-oriented activities, helping others, positive thinking) identified in the literature and constructed two new strategies (spirituality and physical activity) to create a preliminary measure to assess which strategies youth endorse using to maintain or upregulate their positive emotions, a preliminary self-report questionnaire was created (the Positive Emotion Regulation Questionnaire – PERQ). Upon completion of this preliminary questionnaire, the second round of interviews was conducted, querying 13 youth about the PERQ.

During round two, youth endorsed using all strategies (see Table 2) except for eating and substance use, both of which were removed from the measure as they may represent a more atypical population of youth. Youth also made suggestions for how to improve the age-relevant language and clarity of the items. Furthermore, youth endorsed which positive emotions they believe to be most critical to their mental health and to maintain or upregulate. The majority of the participants endorsed that happiness was the most important positive emotion they attempt to maintain. Moreover, they stated that strategies used in maintaining and increasing positive

emotions such as happiness and joy may differ from the strategies used to maintain high arousal emotions such as excitement and suggested removing excitement. They also stated that the regulation of happiness and joy is different from the regulation of self-conscious emotions such as pride, and emotions that involve an inherent social component such as love. Thus, the decision was made to focus the initial questionnaire on the maintenance and upregulation of happiness. With the creation of the questionnaire and preliminary endorsement, the next steps included a thorough literature review to assess for areas of improvement as well as implications of this type of measure before field validation, beginning with a thorough review of positive emotion regulation.

Positive Emotion Regulation

Positive Emotions

Positive emotions influence social competence, life satisfaction, and cognitive skills throughout development. During childhood and adolescence, an increased experience of positive emotions is associated with increased socially appropriate behavior and social success (Sallquist et al., 2009). Youth who are better able to maintain positive emotions experience higher life satisfaction and self-esteem (Gomez-Baya et al., 2018). Positive emotions also assist in honing skills related to goal-focused action, problem-solving, memory encoding, critical thinking, cognitive flexibility, and planning (Gilbert, 2012). Given adolescence is an opportune time to assess emotion regulation as a risk and resilience factor for mental health, the positive emotions must be considered to gain a holistic view.

Positive emotions are regarded as pleasant. From an evolutionary perspective, positive emotions assist in obtaining resources and building cognitive, social, and physiological resilience (Shiota, 2017). Three primary theories guide much of the current understanding of positive emotions. First, the hedonic contingency model posits that when people experience positive emotions, they call on strategies to maintain or increase their positivity (Tugade & Fredrickson, 2007). Second, the reward and approach motivation model posits that positive emotions are experienced as a way to experience/enhance reward or as an effect of a rewarding experience and are distinguished based on the motivations people have to approach contexts that elicit them (Gilbert, 2012). Third, the broaden and build model posits that positive emotions broaden our thought-action repertoires and consequently build our cognitive, social, and physiological resources and that these resources then serve to protect people from stress-related ramifications and buffer against psychopathology (Frederickson, 2001). Understanding how youth regulate their positive emotions may elucidate factors related to risk for or protection against mental health problems. This is an especially important avenue for research as the information about positive emotion regulation is limited compared to negative and broadening this body of knowledge will contribute to a more complete understanding of emotion regulation.

Regulation of Positive Emotions

Most research focuses on the downregulation of negative emotions or changing negative emotions to positive emotions (Young et al., 2019). However, it is evident that the experience, maintenance, and upregulation of positive emotions are crucial in improving mental health and well-being. Positive emotions are associated with a wide range of social, physical, and cognitive

benefits including better sleep quality, increased social support, decreased risk for cardiovascular problems, and increased cognitive control (Silton et al., 2020). Although the hedonic contingency model posits that people call on strategies to maintain or increase positive emotions when they are experienced (Tugade & Fredrickson, 2007), positive emotions can also be downregulated or dampened. And although dampening positive emotions is sometimes necessary (i.e., when the social situation calls for silence and high energy needs to be downregulated), maintaining and increasing positive emotions is necessary for sustaining people's experience of them and maximizing their benefits and problems can occur when positive emotions are being indiscriminately dampened.

There are several ways positive emotion regulation can be assessed. For instance, positive emotion regulation can involve selecting and modifying situations to meet affective goals. When selecting or modifying situations, other considerations that are made include goal regulation, motivations, and affective forecasting (predicting outcome emotions; Carl et al., 2013). Two broad categories of emotion regulation strategies include hedonic, which signifies short-term pleasure, and eudaimonic regulation, which corresponds to long-term activities for personal growth and positive relationships (Tugade & Fredrickson, 2007). Researchers have attempted to combine these aspects of positive emotion regulation into one coherent framework following Gross's process model. For example, Quoidbach et al. (2015) proposed that to assess how people maintain and increase happiness, emotion regulation strategies should be assessed under the following contexts: situation selection, situation modification, attentional deployment, cognitive change, and response modulation. Assessing any of these different aspects of positive emotion regulation provides unique information. One area where there may be room for improvement is

regarding the specific strategies people call on to maintain or increase their positive emotions. Although there is ample evidence that adults maintain and upregulate their positive emotions through a broad range of strategies, this information is particularly scant for youth samples.

Adults regulate positive emotions through a broad range of strategies. The most well-researched strategy is savoring. Savoring, or the ability to reflect on the positive aspects of past, current, or future positive experiences, has been associated with increased life satisfaction, self-esteem, and well-being, whereas low use of savoring has been associated with anhedonia, hopelessness, and life dissatisfaction (Silton et al., 2020). Savoring is associated with increased positive emotion upregulation and decreased downregulation (Carl et al., 2014). Beyond savoring, information on strategies for regulating positive emotions is limited, and research on the benefits of savoring positive emotions has primarily focused on adults. For youth, decreased maintenance of positive emotions is associated with depression (Fussner et al., 2015). Predictors of savoring positive emotions include temperament, parent attachment, and type of event as factors that elicit positive emotions. Temperament is the strongest predictor of savoring in youth with higher cognitive control abilities (Gentzler et al., 2014). Moreover, research indicates that maternal attachment is a strong predictor of savoring. There is little research on strategies other than savoring in the literature on adolescent emotion regulation. Researchers acknowledge a need for studies on strategies for positive emotion regulation in adolescence, especially in intervention contexts (Young et al., 2019). One incremental step is to broaden our knowledge of the strategies youth utilize to regulate positive emotions. A broader repertoire of strategies results in more flexibility and increased capacity for positive emotion regulation and experience (Silton et al., 2020), however, our measures are limited, especially for youth.

Positive Emotion Regulation and Mental Health

Both positive and negative emotions are strongly related to subjective well-being (Martin-Krumm, 2018) and positive emotions are associated with greater mental health and well-being in both adults and youth (Wood et al., 2003; Young et al., 2019). The experience of positive emotions and difficulties with positive emotion regulation is critical in the development and/or maintenance of internalizing and externalizing disorders. Specifically, difficulties in regulating positive emotions are related to drug and alcohol use in adults (Weiss et al., 2018). Decreased experience of positive emotions is implicated in depression and anxiety (Young et al., 2019). And increased savoring is associated with greater affective experience (Tugade & Fredrickson, 2007). However, the information pertaining to the implications of positive emotions in mental health is limited in youth, especially regarding the strategies they use to maintain and increase their positive affect beyond savoring. Further, emotion regulation is a developmental mechanism that explains the link between maltreatment and internalizing and externalizing disorders (Heleniak et al., 2016). Positive emotions are critical in the stress process as they assist in restoring physiological, psychological, and social resources needed to cope with stress (Folkman, 2008; Gloria & Steinhardt, 2016). Moreover, research indicates difficulties regulating positive emotions are more prevalent in samples with post-traumatic stress disorder beyond what is explained by negative emotion regulation difficulties (Weiss et al., 2018; Weiss et al., 2019).

Furthermore, maintaining and increasing positive emotions is critical in building resilience to stressful events. Positive emotions relate to well-being, optimism, locus of control, life satisfaction, and self-control, in children, adolescents, and adults (Tugade & Fredrickson, 2007). People who experience positive emotions more frequently are more likely to positively

reappraise stressful events and strengthening these skills is important for long-term resilience (Tugade & Frederickson, 2007). Resilience is both a trait factor moderating stress and positive emotion regulation strategy use and a resource that increases because of positive emotion regulation strategy use, leading to better well-being. People higher in trait resilience are more adept at calling and maintaining positive emotions efficiently. Stress depletes cognitive resources, so people who are not "trait resilient" will have an even harder time than those who are (Tugade & Fredrickson, 2007). Thus, considering the high rates of stress and trauma youth are exposed to and their susceptibility to internalizing and externalizing symptomology, tools such as the EPRQ are needed to assess the strategies youth have available to them and how effectively they maintain and upregulate their positive emotions to guide interventions (Tugade & Frederickson, 2007). Thus, understanding the range of strategies adolescents have at their disposal is an important area to consider.

Assessing Positive Emotion Regulation

Emotion Regulation Assessment

Current methods of assessing emotion regulation strategies in youth and adults are to target the physiological, cognitive, and/or behavioral aspects of emotion regulation. They tend to vary in terms of the type of emotion (e.g., negative or positive) and emotion regulation constructs being assessed such as specific emotion regulation skills (e.g., emotion understanding), emotion dysregulation, adaptive and maladaptive regulation, and/or strategy use. In addition, extant questionnaires or assessments for youth rely on a wide range of reporters including youth self-

report, other-reporters (e.g., parents, teachers), observational (e.g., in the lab or classroom) physiological (e.g., heart rate variability), and neurobiological assessments.

Different measures use different models and constructs of emotion regulation to guide their tools and constructs that those tools are intended to measure. For example, Grant et al.'s (2018) Adaptive Coping with Emotions (ACE) model, Macdermott et al.'s (2010) three key aspects of emotion regulation (i.e., identified emotional control, emotional self-awareness, and situational responsiveness), Gratz & Roemer's (2004) five key aspects (i.e., evaluate acceptance of emotional responses, goal-directed engagement, impulse control, emotional awareness, access to emotion regulation strategies, and emotional clarity), or Gullone & Taffe's (2010) focus on strategy use alone. All of these aspects and methods of evaluating emotion regulation are beneficial depending on the question and proposed application of findings.

Different self-report measures also vary widely in their features. For instance, some measures emphasize a discrete emotion component (e.g., happy, sad, etc.) or emotion dimension component (e.g., feeling positive or negative/high arousal or low arousal). Moreover, some measures use Likert scales, while others use vignettes and free responses where the respondent selects from multiple strategy options or the respondent is asked to freely state what they typically do to regulate in a given emotion eliciting situation (Nelis et al., 2011). Additionally, some measures will focus on antecedent questions (strategies implemented prior to the experience of the emotions) whereas others will focus on response-focused questions (strategies implemented after the experience of the emotion). Although self-report measures are said to not capture the whole picture, ultimately, "individuals are the only ones able to assess and integrate a

variety of levels of information about their own emotions" (Adrian et al., 2011, p. 172). Thus, the remainder of this review will focus on self-report measures or strategy use.

Strategies Used to Maintain and Upregulate Positive Emotions

The more strategies a person has in their repertoire, the more flexible they can be in utilizing them, which is a skill that is more predictive of positive mental health outcomes (Lougheed & Hollenstein, 2012), however, knowledge regarding which strategies are used to maintain and upregulate positive emotions in youth is limited. This is knowledge that would be particularly useful considering the contra-hedonic shift that occurs in adolescence.

As previously stated, most research has focused on the use of savoring to maintain or increase positive emotions. Although not an exhaustive list, some examples of savoring include people sharing their positive experiences with others, celebrating or congratulating themselves, counting their blessings, reflecting on positive events and associated feelings, etc. (Bryan, 2003; Chadwick et al., Gentzler 2021). In youth, savoring is associated with life satisfaction and increased positive affect and happiness (Chadwick et al., 2021; Gentzler & Root, 2019). Although more numerous in the adult literature, savoring measures used to study savoring to maintain or increase positive emotions in adolescence include Responses to Positive Events, Savoring Beliefs Inventory, Ways of Savoring Checklist (WOSC) (Bryant, 2003; Chadwick et al., 2021; Gentzler et al., 2014). Although savoring has shown to be extremely useful in enhancing positive affect and promoting resilience to stress (Tugade & Frederickson, 2007), emotion regulation research indicates that having a wider range of strategies in one's repertoire further enhances the chances of successful regulation and emotion regulation flexibility in a

wider range of contexts (Lougheed & Hollenstein, 2012; Riediger & Klipker, 2014). Further, an increased experience of positive emotions is related to positive emotion cognitive flexibility and behavioral adaptability (Frederickson & Branigan, 2001). Thus far, support for this hypothesis has only been evaluated with the negative emotions and it stands to reason that this would also apply to the regulation of positive emotions. Thus, one step towards assessing a wide range of positive emotion regulation strategies is to assess what tools are currently available.

Capturing Strategies Beyond Savoring

Seven studies that evaluated self-report strategies used to maintain or upregulate positive emotions were identified (Feldman et al., 2008; Kostiuk, 2011; Livingstone & Srivastava, 2012; Nelis et al., 2011; Nezlek & Kuppens, 2008; Strauss et al., 2016; Weiss et al., 2019). Initial search criteria excluded articles that were not peer-reviewed and included only adolescent samples, however, because those criteria did not yield results, the revised search included all unpublished theses and manuscripts and preliminary data, of all age ranges. For additional details on these studies/measures, please see Table 1. The majority of these studies presented adequate to good validity and reliability and although all seven studies and/or measures have merit, they present with several limitations.

Feldman et al.'s (2008) Responses to Positive Affect (RPA) measure assesses the use of self-focused and emotion-focused positive rumination as well as the dampening of positive emotions. This measure focuses on the dampening of or rumination on happiness. This is composed of 17 items. Results of the initial validation of this study indicate it has acceptable structural validity as internal consistency. This study was novel in that it was one of the first

studies to assess positive emotion maintenance or upregulation without an emphasis on a preceding negative emotion (e.g., going from negative to positive). These results indicated that dampening was associated with low self-esteem and increased depressive symptoms and positive rumination was associated with increased self-esteem and decreased depressive symptoms.

Kostiuk's (2011) Adolescent Emotion Regulation Questionnaire is an unpublished dissertation that evaluated the strategies used to maintain or increase positive emotions and downregulate negative emotions. Strategies included in this measure mapped onto four factors which include positive emotion regulation strategies, negative body experiences, social connection, and negative cognition. The positive emotion regulation strategy factor accounts for the strategies that serve to maintain or increase positive mood and feeling good. These items account for 9 of the 48 items of the measure. Results indicated convergent and divergent validity with measures of internalizing and externalizing symptomology and emotion regulation. The items which comprise this measure related positively to positive self-concept and negatively to depression, anger, anxiety, and disruptive behaviors.

Livingstone et al. (2012) conducted a systematic literature review, interviews, and a confirmatory factor analysis to identify strategies used by adults to upregulate positive emotions including joy, contentment, pride, and love. They identified that their adult participants endorsed 75 strategies that mapped onto three factors. They conceptualized these factors as engagement (e.g., in activities that increase positive emotions), betterment (e.g., in activities for self-improvement), and indulgence (e.g., in food, etc.) and conclude that adults use a variety of strategies to upregulate their emotions. These factors correlated with measures of positive emotion and well-being. Engagement positively correlated with state and trait positive emotion,

and overall well-being, betterment positively correlated with trait positive emotion, and indulgence correlated with state positive emotion. This study resulted in a final 75-item “Positive Upregulation Activities” measure; however, it does not appear to have been developed or utilized further.

Nelis et al. (2011) validated the Emotion Regulation Profile Revised (ERP-R) which assesses strategies used to maintain or increase positive emotions such as joy, excitement, pride, gratitude, contentment, and awe, and downregulate negative emotions such as anger, sadness, fear, jealousy, shame, and guilt, in the form of scenarios. The respondent is given eight possible reactions (four adaptive and four maladaptive) they are to choose from. The positive upregulation strategies map onto four domains which include the behavioral display of positive emotions, mindfully savoring the moment, capitalization (strategies to maximize positive aspects of the present moment), and positive mental time travel (strategies to savor or focus on past or future). This study provided evidence of convergence/discriminant, criterion, and incremental validity and items related to emotional intelligence.

Nezlek & Kuppens’ (2008) Positive Emotion Regulation in Daily Life study utilized the Emotion Regulation Questionnaire (Gross & John, 2003) to evaluate positive emotion regulation by assessing the extent to which people suppress their expressions of positive emotions. Although this measure was designed to evaluate negative emotion regulation, these authors adapted this measure to assess positive emotion contexts. Specifically, they assessed the extent to which suppression of enthusiasm, happiness, activity, energy, alertness, pride, and joy was characteristic or not, of the individual. Suppression of positive emotions was associated with the

decreased experience of positive emotions and an increased experience of negative emotions, low self-esteem, and poor psychological adjustment.

Strauss et al.'s (2016) Emotion Regulation Scale for Adolescents evaluates the maintenance and upregulation of positive emotions and downregulation of negative emotions with strategies that mapped onto the factors comfort and sharing, antisocial behavior, creative activities, physical activities, and eating. This study resulted in a 39-item reliable provisional measure. The authors have not released further information regarding this measure.

Weiss et al.'s (2019) Difficulties in Emotion Regulation Scale – Positive (DERS-P) is an adaptation of the Difficulties in Emotion Regulation Scale (Gratz and Roemer, 2004) that emphasizes positive emotion dysregulation. They identified a 13-item measure with a three-factor structure of nonacceptance of positive emotions, difficulties controlling impulses, and difficulties engaging in goal-directed behaviors. Items emphasize the discrete emotion happiness. This measure demonstrated both convergent and discriminant validity and these factors related to internalizing and externalizing disorder symptomology (i.e., PTSD, depression, and substance abuse). This measure appears to be a valid and reliable measure to assess emotion dysregulation, however, it does not account for strategies to maintain or upregulate positive emotions. The authors suggest that this measure is intended to be flexible in that it can accommodate additional sections (i.e., strategy use).

In addition to the non-Likert type or vignette-based self-report measures of discrete emotions (i.e., Nelis et al., 2011), there is research exploring the regulation of secondary emotions using vignettes as well (i.e., Webb et al., 2016). There is also research that explores the neurobiology (via fMRI) of positive emotion regulation via induced positive emotions with

specific instructions to regulate (i.e., Young et al., 2019). Considering these methods is important when considering mixed-method approaches.

Table 1. Features of positive emotion regulation measures that include strategies beyond savoring

References	Title	Response scale	Sample age	ER focus	Factors	Emotion focus
Feldman et al. (2008)	Responses to Positive Affect	1 (Almost never) to 4 (Almost always)	Adults (mean age = 19)	Maintain/Increase; Strategy use (cognitive)	Positive rumination and dampening; Two subscales of positive rumination (emotion-focused and self-focused)	Happy
Kostiuk, L. M. (2011)	Adolescent Emotion Regulation Questionnaire	1 (Strongly Disagree) to 5 (Strongly Agree)	Adolescents (12-17)	Maintain/increase positive emotions; Downregulate negative emotions; Strategy use (cognitive, behavioral, and physiological)	Positive emotion regulation strategies, negative body experiences, social connection, and negative cognition	Feel good, Positive, Positive mood
Livingstone & Srivastava (2012)	Positive up-regulation activities	1 (Never) to 5 (Very often)	Adults (19-58)	Upregulate positive emotions; Strategy use (cognitive, behavioral, and physiological)	Engagement, betterment, and indulgence	Joy, contentment, pride, or love
Nelis et al. (2011)	Emotion Regulation Profile-Revised	Select from 8 possible reactions each specifying a strategy	Adults (mean age = 19.5)	Maintain/increase positive emotions; Downregulate negative emotions; Strategy use (cognitive and behavioral)	Behavioral display of positive emotions, mindfully savoring the moment, capitalization, and positive mental time travel	Joy, excitement, pride, gratitude, contentment, and awe in the form of scenarios
Nezlek & Kuppens (2008)	Positive Emotion Regulation in Daily Life	1 (Not characteristic of me) to 7 (Very characteristic of me)	Adults (mean age = 18.7)	Downregulation (characteristic vs. not); Strategy use (cognitive)	Reappraisal/suppression	Enthusiastic, happy, active, energetic, alert, proud, and joyful

Table 1. Continued

Strauss et al. (2016)	Emotion Regulation Scale for Adolescents	1(Never) to 4 (Always)	Adolescen ts (18-19)	Maintain/increase positive emotions; Downregulate negative emotions; Strategy use (cognitive, behaviors, and physiological)	Comfort & sharing, antisocial behavior, creative activities, physical activities, and eating	Items include negative and positive focus
Weiss et al. (2019)	Difficulties Regulating Emotions Scale - Positive	1 (Almost never) to 5 (Almost always)	Adults (mean age = 19.37)	Emotion regulation difficulties (cognitive)	Nonacceptance of positive emotions, difficulties controlling impulses, and difficulties engaging in goal-directed behaviors	Happiness

Gaps and Recommendations

As shown in the previous sections, there are several limitations to current emotion regulation assessments. One major limitation on the development of these assessments was the lack of youth involvement, such that they were developed from literature review and expert discussion alone. Another limitation is the limited range of strategies within each measure (see Table 2 for a combined list of examples of strategies explored in these studies). Combining the strategies accounted for by these measures would potentially result in a comprehensive evaluation of strategies, however, at the individual level, they each account for only a small subset of the range of strategies people employ. Another potential limitation is the inclusion of positive and self-conscious emotions (i.e., guilt, shame, pride) within one measure as these are hypothesized as being regulated and conceptualized in very different ways, as self-conscious emotions may require more intentional planning and evaluation, and result in different outcomes (Weir, 2012).

Altogether, adolescents are underrepresented in evaluations of positive emotion regulation strategy use, and that youth and adults seem to employ a wide variety of strategies to maintain and upregulate positive emotions beyond savoring. Research emphasizing negative emotion regulation, as well as research on the savoring of positive emotions, indicates that the more strategies used or that are available to use, the greater or more frequently the individual experiences positive affect and flexibility to regulate in a wider variety of situations (Quoidbach et al., 2010). It stands to reason that this would also be the case for positive emotion maintenance and upregulation with a wider variety of strategies being used beyond savoring. There appears to be enough observed and validated strategies across these studies to create a measure that

evaluates strategies utilized by adolescents to maintain and increase positive emotions.

Considering the data obtained during the preliminary qualitative study, by adding relaxation, including a sensation-seeking item encompassing substance use, and maintaining the decision to include the spirituality item, the PERQ appears to be a significant step forward in bridging this gap.

Table 2. Condensed list of strategies identified across evaluated studies/measures to maintain and/or upregulate positive emotions

Strategy	Definition or example
Savoring	The degree to which an individual focuses on the past, present, or future to maintain or upregulate positive emotions
Socializing	The degree to which an individual engages in social conversation/activities to maintain or increase a positive emotion
Physical Activity	The degree to which an individual engages in physical activity to maintain or increase a positive emotion
Substance Use	The degree to which an individual uses substances to maintain or increase positive emotions
Eating	The degree to which an individual uses indulging in food to maintain or increase happiness.
Relaxation	The degree to which an individual engages in relaxing activities to maintain or increase happiness
Sensation Seeking	The degree to which an individual engages in thrill-seeking behaviors to maintain or increase happiness
Fantasizing	The degree to which an individual relies on fantasizing or visualization to maintain or increase a positive emotion
Self-Improvement	The degree to which an individual engages in activities to promote personal betterment to maintain or increase a positive emotion
Goal-Oriented Activities	The degree to which an individual actively works towards a goal to maintain or increase a positive emotion
Helping Others	The degree to which an individual engages in helping behaviors to maintain or increase a positive emotion
Positive Thinking	The degree to which an individual focuses on positive thoughts to maintain or increase a positive emotion

Purpose of the Present Study

In sum, the emotion regulation and mental health literature would benefit from a reliable and valid strategy-focused measure of the strategies an individual uses to maintain and upregulate their positive emotions. My previous qualitative study was an informative initial step toward creating this type of assessment tool to measure youths' positive emotion upregulation strategy repertoire. Building upon this work, my next step was to refine items and investigate the reliability and validity (construct and convergent) utilizing a large sample of adolescents. Specifically, I assessed the construct and convergent validity as well as the reliability of the Positive Emotion Regulation Questionnaire (PERQ), a novel measure of strategies used to maintain and upregulate positive emotions in a sample of youth.

I also took an exploratory person-centered approach to ER strategy use and assessed profiles of ER strategy use using the PERQ. A measure intended to assess an individual's positive emotion regulation strategy repertoire may be potentially useful for emotion regulation training in stress, mental health, and trauma intervention. Moreover, it is possible that the relation between ER strategy use and both mental health and resilience is better explained by their perceived effectiveness of the strategy (or strategies) instead of how often they use that strategy (i.e., frequency). As such, I asked youth about the perceived effectiveness of each strategy and explore their relations with our outcome variables.

Hypotheses

Hypothesis 1: The confirmatory factor analysis will support a 13-factor model (see figure 1) such that three items will load onto savoring, three items will load onto socializing, three

items will load onto goal pursuit, three items will load onto sensation seeking, three items will load onto helping, three items will load onto fantasizing, three items will load onto physical activity, three items will load onto positive thinking, three items will load onto spiritual or cultural, three items will load onto relaxation, three items will load onto substance use, and three items will load onto eating.

Hypothesis 2: All 13 factor scores will be negatively related to anxiety and depressive symptoms.

Hypothesis 3: All 13 actor scores will be positively related to resilience.

METHOD

Participants

Four hundred and nineteen English-speaking youth between the ages of 13 and 17 years from the US participated in my online Qualtrics survey. I made the decision prior to data collection to retain data for analysis from respondents who completed a minimum of 50% of the survey. This resulted in a final sample of 349 respondents. Mean age was 15.7 ($SD = 1.2$) and their mean reported subjective SES was 5.69 on a 1-10 scale (1 being low SE and 10 being high). Further, 73.9% reported having been exposed to a traumatic event in their lifetime. For a full description of demographic variables, see Table 3.

Table 3. Description of demographic variables

Variable	<i>n</i>	%
Age	21	6
13	38	10.9
14	77	22.1
15	100	28.7
16	113	32.4
17	21	6
Race/Ethnicity		
European American	181	51.9
Hispanic	57	16.3
Black or African American	41	11.7
Asian	28	8
American Indian or Alaska Native	3	.9
Other	39	11.2
Gender		
Male	62	17.8
Female	176	50.4
Non-binary	76	21.8
Other	35	10
Sexual orientation		
Heterosexual/Straight	90	25.8
Homosexual/Gay	50	14.4

Queer	27	7.7
Other	182	52.7
Trauma Endorsement		
Yes	258	73.9
No	61	17.5

Measures

Demographics

Participants provided their demographic information, including age, race, gender, ethnicity, sexual orientation, perceived socioeconomic status, and religious and/or spiritual affiliation. To assess SES, I used Goodman et al.’s adaptation of the 2 “MacArthur ladders” for use among adolescents. Participants indicated at which the rung of the pictorial 10-rung ladder they believe their family stands relative to other families in the US society (*subjective SES*). Anchor points are provided at 10 (“at the top are the people who are the best off—have the most money, the highest amount of schooling, and the jobs that bring the most respect”) and 1 (“at the bottom are the people who are the worst off—they have the least money, little or no education, and no job or the jobs that no one respects”).

Positive Emotion Regulation Questionnaire (PERQ)

The PERQ is a 39-item self-report questionnaire for youth that assesses the strategies they use to maintain or upregulate their happiness. Participants responded to questions on a five-point Likert-type scale ranging from 0 (Never) to 4 (always). This is the initial quantitative validation of this measure; Thus, statistics are not available (see Table 4).

Table 4. The positive emotion regulation questionnaire (PERQ).

The Positive Emotion Regulation Questionnaire – PERQ	
Listed below are a number of statements used to describe how teenagers might respond to different feelings and situations.	
Think about all the things you do when you are HAPPY . HAPPINESS can feel different in different situations. For example, when you feel joy from helping a friend, when you are excited for a trip, etc.	
Please read each statement below and select how often in the past year you have responded in this way when you are HAPPY .	
1. When I want to stay happy or make myself happier, I reminisce. For example, I think about a happy memory.	Never-Rarely-Sometimes-Often-Almost Always
2. When I want to stay happy or make myself happier, I focus on what is happening in the moment. For example, I focus on what is making me happy.	Never-Rarely-Sometimes-Often-Almost Always
3. When I want to stay happy or make myself happier, I think about something in the future. For example, I think about something I am looking forward to.	Never-Rarely-Sometimes-Often-Almost Always
4. When I want to stay happy or make myself happier, I spend time with my friends. For example, hang out, talk on the phone or internet, etc.	Never-Rarely-Sometimes-Often-Almost Always
5. When I want to stay happy or make myself happier, I spend time with family. For example, do something with parents, siblings, etc.	Never-Rarely-Sometimes-Often-Almost Always
6. When I want to stay happy or make myself happier, I include others in what is making me happy. For example, tell someone about what is making me happy, invite someone to join in what is making me happy, go out to eat, etc.	Never-Rarely-Sometimes-Often-Almost Always
7. When I want to stay happy or make myself happier, I work towards a goal. For example, practice an instrument, practice a sport, etc.	Never-Rarely-Sometimes-Often-Almost Always
8. When I want to stay happy or make myself happier, I work on learning something. For example, watch tutorials, take lessons, etc.	Never-Rarely-Sometimes-Often-Almost Always
9. When I want to stay happy or make myself happier, I work on getting things done. For example, finishing tasks, organizing, etc.	Never-Rarely-Sometimes-Often-Almost Always

10. When I want to stay happy or make myself happier, I do something to improve my health. For example, work on being healthy, get better sleep, etc.	Never-Rarely-Sometimes-Often-Almost Always
11. When I want to stay happy or make myself happier, I work on forming better habits. For example, studying more, being more active, flossing, etc.	Never-Rarely-Sometimes-Often-Almost Always
12. When I want to stay happy or make myself happier, I work on breaking bad habits. For example, watching less television, eating junk food, procrastinating, etc.	Never-Rarely-Sometimes-Often-Almost Always
13. When I want to stay happy or make myself happier, I have a good time with drugs and/or alcohol. For example, drink or smoke with friends at a party, etc.	Never-Rarely-Sometimes-Often-Almost Always
14. When I want to stay happy or make myself happier, I do something dangerous or thrilling. For example, do a risky sport, drive fast, etc.	Never-Rarely-Sometimes-Often-Almost Always
15. When I want to stay happy or make myself happier, I do something impulsive. For example, ditch class, doing something I wouldn't normally do, etc.	Never-Rarely-Sometimes-Often-Almost Always
16. When I want to stay happy or make myself happier, I fantasize about the future. For example, picture my career or what my house will look like, etc.	Never-Rarely-Sometimes-Often-Almost Always
17. When I want to stay happy or make myself happier, I daydream. For example, visualize somewhere I want to go or something I want to do, etc.	Never-Rarely-Sometimes-Often-Almost Always
18. When I want to stay happy or make myself happier, I envision doing something I enjoy. For example, imagine playing my video game, being with people, etc.	Never-Rarely-Sometimes-Often-Almost Always
19. When I want to stay happy or make myself happier, I help people. For example, help a friend with a problem, try to make someone happy, etc.	Never-Rarely-Sometimes-Often-Almost Always
20. When I want to stay happy or make myself happier, I volunteer. For example, help in a classroom, at a shelter, etc.	Never-Rarely-Sometimes-Often-Almost Always
21. When I want to stay happy or make myself happier, I do something helpful. For example,	Never-Rarely-Sometimes-Often-Almost Always

help my family with chores, help someone with a project, etc.	
22. When I want to stay happy or make myself happier, I do something physical. For example, go for a run, play a sport, etc.	Never-Rarely-Sometimes-Often-Almost Always
23. When I want to stay happy or make myself happier, I do exercise. For example, go to the gym, lift weights, etc.	Never-Rarely-Sometimes-Often-Almost Always
24. When I want to stay happy or make myself happier, I do something active. For example, go for a hike, go for a walk, etc.	Never-Rarely-Sometimes-Often-Almost Always
25. When I want to stay happy or make myself happier, I think about the good things in my life. For example, my friend and family, etc.	Never-Rarely-Sometimes-Often-Almost Always
26. When I want to stay happy or make myself happier, I think about what things I like about myself. For example, my personality, things I am good at, etc.	Never-Rarely-Sometimes-Often-Almost Always
27. When I want to stay happy or make myself happier, I think positively. For example, look at the bright side, stay optimistic, etc.	Never-Rarely-Sometimes-Often-Almost Always
28. When I want to stay happy or make myself happier, I turn to spirituality. For example, I meditate.	Never-Rarely-Sometimes-Often-Almost Always
29. When I want to stay happy or make myself happier, I turn to Religion. For example, worship, pray, read, etc.	Never-Rarely-Sometimes-Often-Almost Always
30. When I want to stay happy or make myself happier, I turn to culture. For example, engage in cultural traditions, enjoy food from my culture, etc.	Never-Rarely-Sometimes-Often-Almost Always
31. When I want to stay happy or make myself happier, I do something relaxing. For example, watch TV or read a book, etc.	Never-Rarely-Sometimes-Often-Almost Always
32. When I want to stay happy or make myself happier, I do something to calming. For example, play a game, do a hobby, etc.	Never-Rarely-Sometimes-Often-Almost Always
33. When I want to stay happy or make myself happier, I do something peaceful. For example, take a bath or shower, rest, listen to music, etc.	Never-Rarely-Sometimes-Often-Almost Always
34. When I want to stay happy or make myself happier, I enjoy food. For example, go out for a favorite meal, etc.	Never-Rarely-Sometimes-Often-Almost Always

35. When I want to stay happy or make myself happier, I eat something delicious. For example, candy, ice cream, etc.	Never-Rarely-Sometimes-Often-Almost Always
36. When I want to stay happy or make myself happier, I like to eat something comforting. For example, a favorite treat, etc.	Never-Rarely-Sometimes-Often-Almost Always
37. When I want to stay happy or make myself happier, I use alcohol. For example, drink with friends at a party.	Never-Rarely-Sometimes-Often-Almost Always
38. When I want to stay happy or make myself happier, I use drugs. For example, use cannabis with friends.	Never-Rarely-Sometimes-Often-Almost Always
39. When I want to stay happy or make myself happier, I experiment with substances. For example, try new drugs or alcohol with friends.	Never-Rarely-Sometimes-Often-Almost Always
SUBSCALES Savoring. These items reflect the degree to which an individual savors what is making them happy by reminiscing, focusing on the moment, and/or anticipating the future Socializing. These items reflect the degree to which an individual an individual engages in social conversation/activities to maintain or increase happiness. Pursuing a goal. These items reflect the degree to which an individual actively works towards a goal to maintain or increase happiness. Personal growth. These items reflect the degree to which an individual engages in activities to promote personal betterment to maintain or increase happiness. Sensation seeking. These items reflect the degree to which an individual indulges in risky behaviors use to maintain or increase happiness. Fantasy. These items reflect the degree to which an individual relies on fantasizing or visualization to maintain or increase happiness. Helping. These items reflect the degree to which an individual engages in helping behavior to maintain or increase happiness. Physical activity. These items reflect the degree to which an individual engages in physical activity to maintain or increase happiness. Positive thinking. These items reflect the degree to which an individual focuses on positive thoughts to maintain or increase happiness. Spiritual or Cultural activities. These items reflect the degree to which an individual engages in activities relates to spirituality, religion, or culture to maintain or increase happiness. Relaxation. These items reflect the degree to which an individual engages in activities that are calming or relaxing to maintain or increase their happiness. Eating. These items reflect the degree to which an individual engages in activities that relate to indulging in food to maintain or increase their happiness. Substance use. These items reflect the degree to which an individual engages in activities that relate to indulging in substances to maintain or increase their happiness.	

Positive Emotion Regulation Effectiveness Scale (PERQ Effectiveness Scale)

In addition to administering the PERQ, participants indicated how effective they believe each strategy is on a scale from 0-4 (0 being not at all and 4 being extremely).

Generalized Anxiety Disorder-7 (GAD-7; Spitzer et al., 2006)

The GAD-7 is a 7-item measure that assesses generalized anxiety symptoms. Participants responded on a four-point Likert-type scale with response options ranging from 0 (not at all) to 3 (nearly every day). Symptoms are assessed for the prior two weeks. Scores range from 0 to 21 with higher scores indicating elevated levels of anxiety symptomology. Example items include, “Feeling nervous, anxious, or on edge” or “Worrying too much about different things”. Past studies have demonstrated good internal consistency (Cronbach alpha = .92) and test-retest reliability (intraclass correlation = 0.83; Spitzer et al., 2006). This measure has also been validated in an adolescent population and determined to be a superior measure of anxiety symptoms compared to other youth measures (Mossman et al., 2017). The internal consistency estimate for the anxiety symptom scale in this study was good (Omega reliability estimate = .87).

Patient Health Questionnaire-8: Adolescent Version (PHQ-8A; Kroenke & Spitzer, 2002)

The PHQ-8A is an 8-item questionnaire assessing the prevalence and severity of depression symptomology in adolescents. The PHQ-8A is identical to the PHQ-9A (Kroenke et al., 2001), with the exclusion of the suicidality item. Participants responded to items based on the previous two weeks. Participants indicated how many days they experienced depressive symptoms on a four-point Likert-type scale ranging from 0 (not at all) to 3 (nearly every day).

Scores range from 0 to 24 and higher scores indicate increased levels of depression symptoms. Example items include, “Feeling down, depressed, or hopeless” or “Feeling bad about yourself, or that you are a failure, or have let yourself or your family down”. Past studies have demonstrated good internal consistency (Cronbach alpha = .88) and convergent validity (Spearman’s rank coefficient = .62; Shin et al., 2019). Of note, the PHQ-8A was revised and validated in a sample of adolescents (Johnson et al., 2002). The only difference between the youth revision and the original PHQ-8A is the wording of some items is more teen appropriate. This version with the exclusion of the suicidality item was used in the current study. The internal consistency estimate for the depression symptoms scale in this study was good (Omega reliability estimate = .86).

Brief Resilience Scale (BRS; Smith et al., 2008)

The Brief Resilience Scale (BRS; Smith et al., 2008) is a 6-item measure assessing the ability to rebound from stressful events. Participants responded to items on a five-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). Scores range from 6 to 30 with higher scores indicating higher resilience. Example items include, “I tend to bounce back quickly after hard times” or “I have a hard time making it through stressful events”. Past studies have demonstrated good internal consistency (Cronbach’s alpha = .80-.91). The internal consistency estimate for the resilience scale in this study was good (Omega reliability estimate = .86).

Traumatic Experience Question (Weems et al., 2014)

Participants were asked whether they have experienced any adverse life events. The question is as follows: "Many people go through things that are traumatic, very upsetting, or frightening, for example, being hurt by someone, losing a loved one, or a natural disaster. Has anything happened to you that was traumatic, very scary, or frightening?"

Difficulties in Emotion Regulation Scale - Positive (DERS-P; Weiss et al., 2015)

Difficulties in Emotion Regulation Scale – Positive is an adaptation of the Difficulties in Emotion Regulation Scale (Gratz and Roemer, 2004) that emphasizes positive emotion dysregulation. The authors identified a 13-item measure with a three-factor structure of nonacceptance of positive emotions, difficulties controlling impulses, and difficulties engaging in goal-directed behaviors. Participants responded on a five-point Likert-type scale ranging from 1 (Almost never) to 5 (Almost always). Example items include, "When I'm happy, I have difficulty focusing on other things" or "When I'm happy, I become angry with myself for feeling that way". Higher scores indicate greater difficulties regulating positive emotions. Past studies have shown good internal consistency (Cronbach's $\alpha = .83-.90$) and convergent and discriminant validity (Weiss et al., 2015). The internal consistency estimate for the difficulties in emotion regulation scale in this study was excellent (Omega reliability estimate = .91).

Procedure

I recruited 13-17 year-old youth through a national advertisement using Instagram. The purpose of selecting a social media platform for recruitment was twofold. First, it allowed for a

potentially more nationally representative sample. Second, unlike other online data collection platforms, youth were able to participate in research. All youth who participated in the study were entered into a drawing to win one of five \$50 Amazon gift cards. Advertisements on Instagram were launched on July 20th, 2022, and ran until August 2nd, 2022. These advertisements allowed youth to self-select into the study and directed them to Qualtrics where they first read a description of the study and then provided assent. Passive parent consent was used in this study due to its minimal risk for youth. Specifically, youth were asked to show the study description to their parents and obtain their verbal consent prior to continuing. The Montana State University Institutional Review Board (IRB) approved the bypass of parental consent and all other procedures. Participants continued and were prompted to complete a series of questionnaires once assent was obtained. Demographic questions were asked first for all youth, but the order of questionnaires for the rest of the survey was randomized for each youth to reduce possible order effects. Youth were thanked for their time at the completion of the questionnaires and asked to complete one additional optional questionnaire. If they elected to complete the optional questionnaire, they proceeded to complete the PERQ-Effectiveness scale.

Analytic Strategy

Power

The sample size for this project was determined based on Monte Carlo simulations ($N = 10,000$) in *MPlus* 8 (Muthén & Muthén, 2017). Factor loadings were specified at .5. Latent variable variances were specified at .5. Covariances among latent variables were specified at .5, except for items predicted to be skewed (i.e., sensation seeking and spiritual/cultural strategies),

which were specified at .2. Residual variances for items were specified at 1, except for items predicted to be skewed (i.e., sensation seeking and spiritual/cultural strategies), which were specified at .5. Intercepts were specified at 2 (mid-point of scale). The simulation indicated good model fit (RMSEA = .01). A minimum sample of 300 was estimated to provide sufficient power (100%) to detect estimated effects (≥ 0.5) and adequate coverage (.936-.946.).

Confirmatory Factor Analysis

I conducted a confirmatory factor analysis using MPlus 8 (Muthén & Muthén, 2017) to test hypothesis 1 and assess the primary model of interest that includes 13 factors and 39 items (see Model 1, Figure 1). I constrained the variance of latent factors to 1 (to ensure identification of the model) but allowed the covariance between latent factors to be freely estimated. I evaluated model fit (Kline, 2016), using the chi-square statistic (non-significance indicates a good fitting model), the Comparative Fit Index (CFI; above .90 is a good fitting model), the Root Mean Square Residual (RMSEA; below .08 indicates an acceptable fitting model and below .05 is a good fitting model), and the Standardized Root Mean Square Residual (SRMR; below .08 is indicative of a good fitting model). I also examined the factor loadings, covariances, and residual variances to identify areas of concern and whether the modifications were needed to improve the fit of the model.

Given the primary model was not well-supported by the data, I assessed the second model with a hierarchical confirmatory factor analysis (Model 2, Figure 2). This model assumes that the 13 factors load onto three latent variables (behavioral, cognitive, and social). Given the second model was not supported, I assessed the third model using a confirmatory factor analysis

(Model 3, Figure 3). This model assumes items load onto three latent variables (behavioral, cognitive, and social). To assess these models, I followed the same process as for Model 1. Given none of the proposed models are supported, I conducted an exploratory factor analysis (EFA) using MPlus 8 (Muthén & Muthén, 2017), which assessed the natural underlying structure of the 39 items as well as explored how the items relate to one another. I then extracted the factors produced by the EFA for use in subsequent analyses.

Validity and Reliability

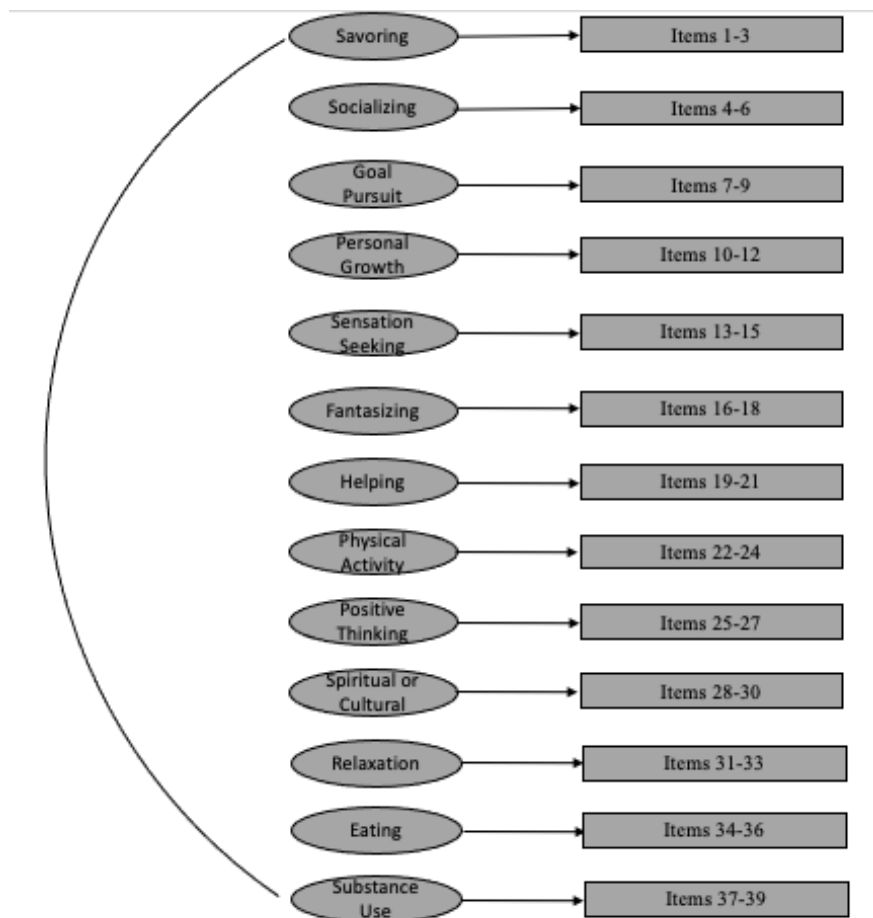
The GAD-7, PHQ-8A, and Brief Resilience Scale were used to evaluate convergent validity. To assess convergent validity, correlation coefficients were calculated for total GAD-7, PHQ-8A, and Resilience scores and each factor score of the PERQ. To assess reliability (internal consistency), Omega scores were calculated.

Exploratory Analyses

As discussed in the introduction, I took a person-centered approach to explore these data. Specifically, using a latent profile analysis (LPA) in MPlus 8 (Muthén & Muthén, 2017), I identified strategy use profiles or probability-based clusters of adolescents who utilize (or not) specific strategies. I then explored how profiles related to various outcomes (i.e., trauma endorsement, BRS, DERS-P, PHQ-8A, and GAD-7) using a one-way analysis of variance. The LPA identified the optimal number of subsets of youth who share similar strategy use patterns that relate to specific outcomes. To determine the optimal number of profiles considered several factors (Lanza & Cooper, 2016). Specifically, I considered the Akaike Information Criteria

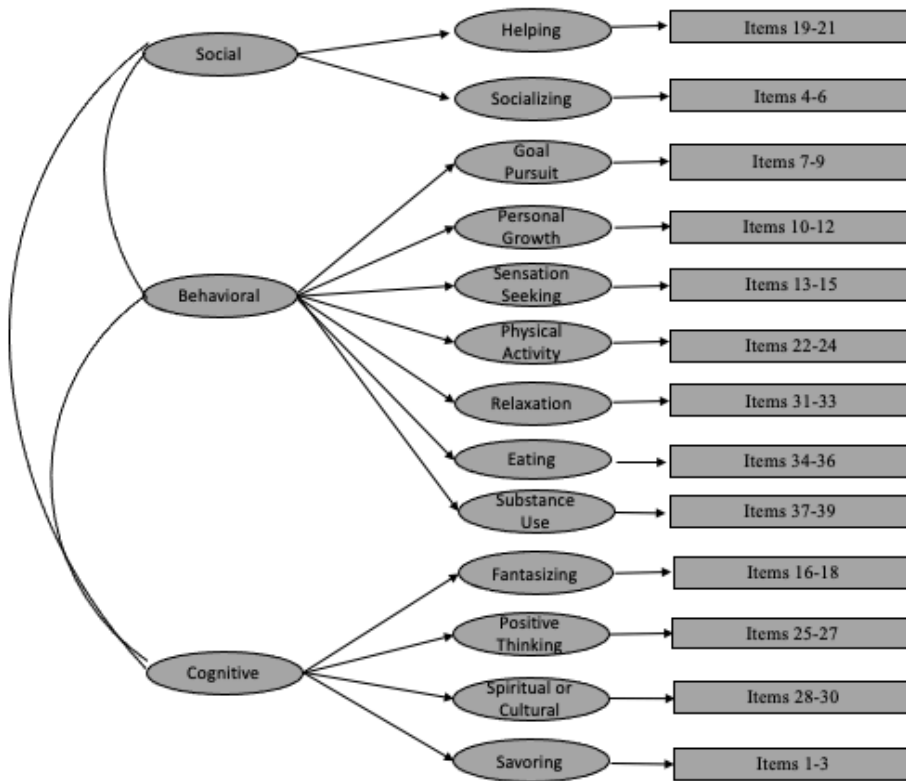
(AIC), Sample-Size Adjusted Bayesian Information Criteria (BIC), and Entropy (reflects effectiveness of categorization based on probability outcomes) measures when comparing models. I attempted to minimize the AIC and BIC and produce a strong entropy measure (approaching 1.00). Further, in addition to assessing how the frequency of strategy use related to internalizing symptoms, I also assessed how effectiveness relates to internalizing symptoms. Specifically, I calculated correlation coefficients for strategy effectiveness of each factor and the PHQ-8A and GAD-7.

Figure 1. Confirmatory factor analysis model assessing 11 unique factors



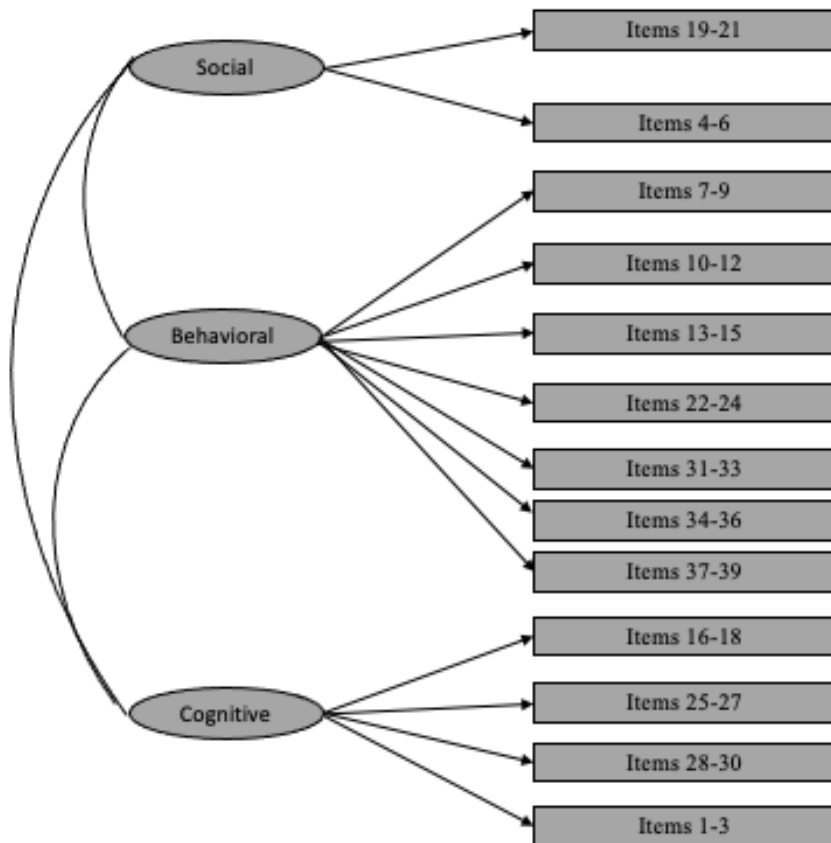
Note: All latent factors covary.

Figure 2. Alternative model 1: hierarchical confirmatory factor analysis



Note: All latent factors covary.

Figure 3. Alternative model 2: confirmatory factor analysis



Note: All latent factors covary.

RESULTS

Preliminary Examination of the Data

Data were first inspected for duplicate IP addresses and bot detection and no duplicate addresses or bots were identified. There were no significant differences in demographic variables between adolescents who completed 50% of the survey and adolescents who did not complete the survey. Missing data inspection indicated a prevalence of less than 5% missing data; Therefore, further missing data analyses were not conducted. Moreover, I used full maximum likelihood estimation to address this minimal missingness in subsequent analyses (Enders & Bandalos, 2001).

Regarding the PERQ, the item level inspection indicated that most items were normally distributed except for three substance use items, which were extremely positively skewed. Resilience, anxiety, and depression measures were normally skewed, whereas difficulties regulating positive emotions and trauma measures were negatively skewed. I chose to use robust maximum likelihood ratio in MPlus 8 (Muthén & Muthén, 2017) to handle skewness. Regarding measures of anxiety, depression, resilience, difficulties regulating positive emotions, and trauma, results indicated this sample was normally distributed on these measures, reporting mild to moderate means for each. Means, standard deviations, skewness, and kurtosis for all variables are displayed in Table 5. Correlations for all variables and PERQ items are displayed in Table 6

Table 5. Means (*M*), standard deviations (*SD*), skewness, and kurtosis for all variables

Strategy/Item	% Endorsed (at least rarely)	<i>M</i>	<i>SD</i>	Skewness	Kurtosis
Savoring					
PERQ1	89.6	1.93	1.07	.04	-.39
PERQ2	94.8	2.46	1.12	-.34	-.61

Table 5 Continued

PERQ3	91.4	2.38	1.27	-.28	-1.02
Socializing					
PERQ4	94.3	2.62	1.24	-.48	-.87
PERQ5	79.1	1.46	1.07	.40	-.41
PERQ6	89.1	2.11	1.22	-.05	-.90
Pursuing a goal					
PERQ7	80.8	1.82	1.25	.06	-1.00
PERQ8	78.8	1.61	1.21	.31	-.84
PERQ9	83	1.80	1.19	.14	-.76
Personal growth					
PERQ10	78.4	1.54	1.15	.40	-.54
PERQ11	80.5	1.57	1.13	.35	-.55
PERQ12	74.3	1.29	1.03	.45	-.40
Sensation seeking					
PERQ13	27.5	.61	1.15	1.84	2.19
PERQ14	46.7	.89	1.12	.95	-.20
PERQ15	58.4	1.11	1.20	.87	-.15
Fantasizing					
PERQ16	87.4	2.36	1.36	-.33	-1.09
PERQ17	93.2	2.78	1.22	-.76	-.40
PERQ18	92	2.27	1.17	-.18	-.71
Helping behavior					
PERQ19	91.4	2.14	1.13	-.08	-.73
PERQ20	67.1	1.23	1.15	.68	-.33
PERQ21	80	1.49	1.07	.35	-.37
Physical activity					
PERQ22	68.8	1.38	1.24	.53	-.75
PERQ23	58.3	1.11	1.21	.85	-.34
PERQ24	75.3	1.55	1.22	.35	-.80
Positive thinking					
PERQ25	88.8	2.05	1.17	-.06	-.80
PERQ26	70.5	1.30	1.15	.60	-.44
PERQ27	85.4	1.79	1.19	.26	-.78
Spiritual or cultural activities					
PERQ28	45	.87	1.16	1.18	.39
PERQ29	30.9	.63	1.09	1.70	1.95

Table 5. Continued

PERQ30	49.1	.92	1.12	1.00	.06
Relaxation					
PERQ31	97.9	2.99	.99	-.79	.123
PERQ32	97.2	2.91	1.04	-.72	-.01
PERQ33	97.1	2.87	1.05	-.74	-.07
Eating					
PERQ34	90.2	2.29	1.16	-.39	-.54
PERQ35	92.2	2.47	1.15	-.49	-.39
PERQ36	93.1	2.46	1.14	-.42	-.50
Substance use					
PERQ37	19.1	.34	.81	2.76	7.67
PERQ38	22.1	.54	1.16	2.06	2.88
PERQ39	15.7	.29	.78	2.95	8.67
Outcomes					
Resilience		15.84	5.01	.36	-.50
Anxiety		11.90	5.48	-.22	-.96
Depression		13.10	6.12	-.12	-.90
Difficulties Regulating Positive Emotions		25.13	10.04	1.20	1.30
Trauma		.81	.39	-1.58	.49

Table 6. Correlations for all variables and PERQ items

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Resilience											
2. Anxiety	-.40**										
3. Depression	-.39**	.77**									
4. Difficulties	-.28**	.45**	.53**								
5. Trauma	-.24**	.35**	.25**	.14*							
6. PERQ1	-0.02	0.00	-0.05	-0.10	0.02						
7. PERQ2	.15**	-.24**	-.18**	-0.08	-.11*	0.09					
8. PERQ3	0.01	0.03	0.00	-0.02	0.02	.21**	.14**				
9. PERQ4	0.01	-0.09	-0.04	-0.05	-0.04	0.09	.24**	.154**			
10. PERQ5	.15**	-.22**	-.16**	-.15**	-.12*	.22**	.21**	0.062	0.09		
11. PERQ6	0.08	-0.08	-0.03	0.04	0.04	.15**	.29**	.221**	.37**	.15**	
12. PERQ7	0.10	0.01	-0.09	-0.09	-0.01	0.07	0.05	.333**	0.02	0.09	.15**
13. PERQ8	0.10	0.08	-0.03	0.06	0.03	.16**	.16**	.332**	0.03	.12*	.17**
14. PERQ9	0.07	0.06	-0.03	-.11*	0.11	.15**	0.01	.277**	-0.05	.20**	0.03
15. PERQ10	.16**	-0.08	-.12*	-.13*	0.00	0.05	.20**	.244**	-0.04	0.10	0.07
16. PERQ11	.16**	-0.04	-.11*	-0.07	0.04	0.09	.14**	.238**	0.04	.16**	0.08
17. PERQ12	0.09	0.04	-0.00	-0.05	0.02	0.07	.12*	.224**	0.06	0.08	.13*
18. PERQ13	-.15**	.14*	.24**	.18**	.17**	0.03	-0.00	0.061	0.08	-0.03	0.09
19. PERQ14	-0.02	.13*	.22**	.27**	0.07	0.07	0.03	0.051	0.09	-0.06	0.03
20. PERQ15	-.18**	.21**	.35**	.41**	0.09	0.08	-0.01	0.028	0.09	-0.07	.14**
21. PERQ16	-0.01	.14**	0.06	0.03	-0.01	.18**	0.01	.545**	0.02	0.03	0.07
22. PERQ17	-0.07	.19**	.14**	0.05	0.08	.19**	-0.03	.327**	0.03	0.07	.13*
23. PERQ18	-0.09	.16**	0.08	0.08	.13*	.30**	0.01	.267**	0.07	0.11	.19**
24. PERQ19	0.06	0.04	-0.03	-0.02	-0.00	.31**	.25**	.147**	.17**	.26**	.31**
25. PERQ20	0.06	0.04	-0.04	0.08	-0.03	.18**	.13*	.144**	0.06	.12*	.16**

Table 6. Continued

26. PERQ21	0.09	0.05	-0.02	-0.04	-0.02	.28**	.15**	.134*	0.03	.30**	.21**
27. PERQ22	.16**	-0.05	-.14**	-.18**	-0.09	0.10	.13*	.15**	.15**	0.06	0.07
28. PERQ23	.18**	-0.04	-0.08	-0.08	-0.07	0.02	0.10	.12*	.13*	0.05	0.04
29. PERQ24	.13*	-0.10	-.14**	-.13*	-0.06	.11*	.18**	.17**	.18**	.12*	.15**
30. PERQ25	0.10	-.13*	-.12*	-0.06	-0.08	.31**	.29**	.25**	.23**	.29**	.28**
31. PERQ26	0.10	-.16**	-.17**	-0.08	-0.01	.18**	.20**	.24**	.13*	.21**	.25**
32. PERQ27	.16**	-.16**	-.19**	-0.06	-0.07	.17**	.33**	.24**	0.08	.24**	.23**
33. PERQ28	-0.08	.16**	0.09	0.05	.15**	.16**	0.08	.18**	.12*	0.04	0.08
34. PERQ29	-0.01	0.06	-0.05	0.04	0.04	.16**	0.09	.13*	-0.02	0.09	0.04
35. PERQ30	0.09	-0.02	-0.05	-0.01	-0.06	.20**	.14**	.17**	.16**	.17**	.21**
36. PERQ31	-0.03	-0.02	0.06	0.02	-0.07	0.03	0.06	0.08	0.07	.14*	.12*
37. PERQ32	-0.03	0.08	0.06	0.01	-0.09	.16**	.11*	0.07	0.07	.11*	.14**
38. PERQ33	-.11*	0.1	.13*	0.07	-0.01	0.06	0.08	.17**	0.09	0.09	0.06
39. PERQ34	-.11*	0.1	.13*	0.07	-0.01	0.06	0.08	.17**	0.09	0.09	0.06
40. PERQ35	-0.07	0.01	0.06	-0.06	0.01	.14**	0.08	.18**	.26**	.16**	.21**
41. PERQ36	-.15**	0.05	.12*	0.02	0.04	0.10	0.06	.19**	.27**	.11*	.25**
42. PERQ37	-.11*	0.09	.18**	.16**	.12*	0.05	-0.01	0.03	0.04	-0.04	0.03
43. PERQ38	-.15**	.12*	.23**	.18**	.14*	0.05	-0.03	0.04	0.04	-0.03	0.06
44. PERQ39	-0.10	0.09	.20**	.17**	0.10	0.06	0.01	0.05	0.02	-0.05	0.07

Table 6. Continued

Variable	12	13	14	15	16	17	18	19	20	21	22
13. PERQ8	.58**										
14. PERQ9	.39**	.32**									
15. PERQ10	.39**	.32**	.40**								
16. PERQ11	.38**	.41**	.41**	.61**							
17. PERQ12	.36**	.33**	.38**	.49**	.59**						
18. PERQ13	-0.09	-0.01	-0.01	0.01	0.03	-0.01					
19. PERQ14	-0.01	0.04	-0.08	-0.01	0.05	0.04	.41**				
20. PERQ15	-0.09	-0.01	-.15**	-.12*	-0.01	-0.06	.47**	.61**			
21. PERQ16	.21**	.22**	.20**	.24**	.20**	.11*	-0.03	-0.05	-0.05		
22. PERQ17	0.10	.16**	.12*	.15**	.14*	.13*	-0.07	-0.1	0.02	.55**	
23. PERQ18	.11*	.21**	.13*	.15**	.13*	0.10	-0.04	-.15**	-0.02	.43**	.51**
24. PERQ19	.15**	.18**	.21**	.14**	.18**	.19**	-0.06	-0.06	-0.05	.14**	.14*
25. PERQ20	.18**	.27**	.24**	.21**	.31**	.22**	-0.02	0.03	-0.03	.13*	0.06
26. PERQ21	.23**	.24**	.33**	.25**	.27**	.26**	-0.06	0.01	0.00	.16**	.14**
27. PERQ22	.30**	.19**	.22**	.40**	.37**	.33**	-0.04	.13*	-0.10	0.09	0.02
28. PERQ23	.30**	.24**	.22**	.42**	.41**	.35**	-0.01	.16**	-0.09	0.03	-0.03
29. PERQ24	.22**	.26**	.23**	.38**	.36**	.34**	-0.08	0.08	-0.06	0.08	0.03
30. PERQ25	.13*	.22**	.19**	.20**	.24**	.23**	-0.06	-0.03	-0.00	.23**	.14**
31. PERQ26	.21**	.19**	.19**	.23**	.23**	.15**	-0.07	-0.07	-.12*	.21**	.18**
32. PERQ27	.18**	.22**	0.07	.26**	.29**	.20**	-0.05	0.02	-.12*	.20**	.16**
33. PERQ28	.13*	.19**	.19**	.21**	.23**	.25**	.22**	.18**	0.07	.15**	.13*
34. PERQ29	.13*	.20**	.12*	.20**	.16**	.14**	0.08	0.10	0.01	.20**	.13*
35. PERQ30	.21**	.22**	.12*	0.10	.15**	.17**	-0.01	-0.03	-0.03	.20**	.19**
36. PERQ31	0.04	0.08	0.04	.13*	0.05	0.06	0.01	-0.09	0.03	.13*	.25**
37. PERQ32	0.05	0.04	-0.01	0.01	0.05	.11*	-.11*	-0.08	-0.06	.11*	.25**

Table 6. Continued

38. PERQ33	0.06	0.04	.12*	.12*	.11*	.12*	0.02	-0.03	0.05	.21**	.26**
39. PERQ34	0.06	0.04	.12*	.12*	.11*	.12*	0.02	-0.03	0.05	.21**	.26**
40. PERQ35	0.09	0.06	0.04	0.04	0.10	0	0.03	0.04	.12*	.18**	.17**
41. PERQ36	0.06	0.04	0.04	0.02	0.07	0.01	0.10	0.03	.14**	.20**	.18**
42. PERQ37	-.13*	-0.03	-0.05	-0.01	-0.02	-0.1	.69**	.38**	.41**	-0.02	-0.07
43. PERQ38	-0.06	-0.02	0	0.01	0.03	0.01	.88**	.36**	.43**	-0.02	-0.06
44. PERQ39	-.11*	-0.01	-0.04	-0.00	-0.01	-0.06	.72**	.36**	.45**	-0.03	-0.06

Table 6. Continued

Variable	23	24	25	26	27	28	29	30	31	32	33
24. PERQ19	.18**										
25. PERQ20	0.09	.47**									
26. PERQ21	.14**	.54**	.47**								
27. PERQ22	-0.06	.21**	.22**	.17**							
28. PERQ23	-0.10	.17**	.20**	.14**	.67**						
29. PERQ24	-0.06	.24**	.21**	.21**	.67**	.60**					
30. PERQ25	.17**	.33**	.14*	.30**	.14**	0.1	.26**				
31. PERQ26	.18**	.14**	.11*	.20**	.14**	0.06	.13*	.37**			
32. PERQ27	.21**	.25**	.15**	.15**	.16**	.12*	.16**	.42**	.44**		
33. PERQ28	.13*	0.09	.11*	-0.04	.20**	.16**	.17**	.20**	.13*	.20**	
34. PERQ29	.11*	.14*	.16**	0.07	.15**	.14**	.18**	.26**	.15**	.23**	.52**
35. PERQ30	.19**	.16**	.16**	.11*	.14**	0.05	.15**	.22**	.16**	.21**	.30**
36. PERQ31	.24**	0.01	0.02	-0.02	0.02	-0.07	-0.01	0.10	.12*	.12*	-0.02
37. PERQ32	.30**	0.10	0.03	0.02	-0.02	-.13*	-0.07	.18**	.16**	.22**	.13*
38. PERQ33	.20**	0.07	0.04	0.04	0.01	-0.01	0.03	.18**	.26**	.16**	.17**
39. PERQ34	.20**	0.07	0.04	0.04	0.01	-0.01	0.03	.18**	.26**	.16**	.17**

40. PERQ35	.20**	.11*	0.08	0.08	0.04	-0.04	0.03	.20**	.23**	.14**	.13*
41. PERQ36	.23**	.11*	0.04	0.02	0.04	-0.05	0.01	.18**	.21**	.14**	.12*
42. PERQ37	-0.07	-0.04	-0.00	0.03	-0.03	0.03	-0.04	-0.06	-.11*	-0.071	.13*
43. PERQ38	-0.02	-0.08	-0.01	0.00	-0.07	-0.03	-0.10	-0.03	-0.05	-0.04	.20**
44. PERQ39	-0.01	-0.06	0.01	0.03	-0.07	-0.01	-0.08	-0.02	-0.03	-0.04	.11*

Table 6. Continued

Variable	34	35	36	37	38	39	40	41	42	43	44
35. PERQ30	.33**										
36. PERQ31	0.06	.18**									
37. PERQ32	0.03	.19**	.45**								
38. PERQ33	0.08	.20**	.33**	.36**							
39. PERQ34	0.08	.20**	.33**	.36**							
40. PERQ35	0.09	.20**	.22**	.12*	.22**	.75**					
41. PERQ36	0.08	.17**	.29**	.15**	.21**	.76**	.86**				
42. PERQ37	-0.01	-0.06	0.04	-.13*	-0.00	0.07	0.05	0.08			
43. PERQ38	0.09	0.01	0.01	-.11*	0.02	0.08	0.04	0.10	.64**		
44. PERQ39	0.05	-0.02	0.02	-0.07	0.04	0.08	0.09	0.10	.74**	.74**	

Confirmatory Factor Analysis

Model 1

The global fit indices for the initial CFA indicated a poor-fitting model overall. The chi-square statistic was significant ($p < .001$), the CFI was below .90 (CFI = 0.89), and the RMSEA (and 90% CI) was .05 [0.05 0.06]. Further, the model yielded a non-positive definite. Further inspection suggested that the cause of the problem was a linear dependency between two or more latent variables, this suggested there were no modifications that would improve the fit of this model. Specifically, substance use and sensation seeking were extremely highly correlated ($r = .99$). Further, the savoring items were likely mis-specified as indicated by extremely low factor loadings. Thus, the decision was made to proceed with the secondary model.

Model 2

The global fit indices for the second CFA indicated a poor-fitting model overall. The chi-square statistic was significant ($p < .001$), the CFI was below .90 (CFI = 0.78), and the RMSEA (and 90% CI) was .06 [0.06 0.07]. Again, the model yielded a non-positive definite. Further inspection suggested that the cause of the problem was a linear dependency between two or more latent variables, this suggested there were no modifications that would improve the fit of this model. Examination of the results suggested that the linear dependency existed between the substance use and sensation seeking. In addition, we also found the factor loadings for the savoring items were extremely low and may belong to other factors. Thus, the decision was made to proceed with the third model.

Model 3

The global fit indices for the final CFA indicated a poor-fitting model overall. The chi-square statistic was significant ($p < .001$), the CFI was below .90 (CFI = 0.35), and the RMSEA (and 90% CI) was .11 [0.11 0.12]. The decision was made to proceed with an exploratory factor analysis to assess the underlying data structure.

Exploratory Factor Analysis

Exploratory factor analyses were conducted using principal components analysis and Varimax rotation in SPSS 28.0. This was followed by a Principal Axis Factoring extraction method with Varimax with Kaiser Normalization rotation to simplify factors by minimizing cross-products of loadings (Tabachnick & Fidell, 2001). Items with factor loadings $> .35$ were visualized. The initial EFA identified an 11-factor solution. Further inspection of this solution revealed one important finding regarding the substance use factor and the sensation seeking factor. Specifically, one item within the sensation seeking subscale loaded onto one factor with the substance use scale items (see Factor 1 in Table 7). Moreover, the factor loading for this specific item was greater than all three of the hypothesized substance use items (.907). Considering the sensation seeking items account for substance use behaviors as well as other behaviors, the decision was made to remove the three items related to substance use and conduct another EFA.

For the second EFA, results of the principal components analysis with Varimax rotation indicated that there were 10 factors with eigenvalues over 1 and they accounted for a total of 51% of the variance. Examination of the scree plot (see Figure 4) also suggested a 10-factor

solution (i.e., there was a fairly large break between the tenth and eleventh eigenvalues). The eating factor items all loaded onto one factor, the physical activity items loaded onto one factor, the helping behavior items loaded onto one factor, the fantasizing items loaded onto one factor, the positive thinking items loaded onto one factor, the relaxation items loaded onto one factor, and the spiritual and cultural activities items loaded onto one factor. Thus, all factors were retained, and composite scores were calculated. Once the substance use items were removed, the sensation seeking items also clustered onto one factor. The personal growth and pursuing a goal items all loaded onto one factor and were therefore combined into one composite score (personal growth). Item 10, a personal growth item reflecting physical activity was cross-loaded onto physical activity, however, the factor loading was stronger for this item on personal growth/goal pursuit and thus retained for that factor. One socializing item (item 5) yielded a factor loading less than .35 and was not retained.

The savoring items loaded onto three separate factors. The reminiscing item loaded onto the helping behavior factor, the ‘savoring the moment’ item loaded onto the positive thinking factor, and the ‘savoring the future’ loaded onto the fantasizing factor. Theoretical considerations lead to the decision to retain the ‘savoring the moment’ item as a positive thinking factor item. Further, the decision was made to retain the ‘savoring the future’ item as a fantasizing factor item. However, the decision was made to remove the ‘reminiscing’ item altogether. These decisions lead to a final 10-factor model (see Table 8) and revised PERQ (see Table 9).

Figure 4. Scree plot

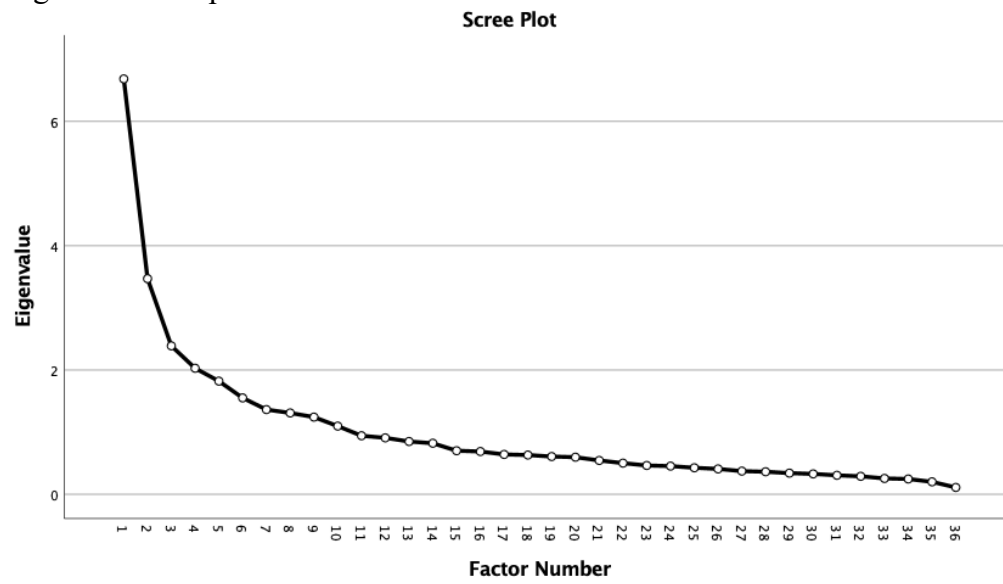


Table 7. EFA factor loadings < .35 for PERQ items

Variable/Factor	1	2	3	4	5	6	7	8	9	10	11
PERQ1					.374						
PERQ2							.424				
PERQ3						.552					
PERQ4											.545
PERQ5											
PERQ6											.564
PERQ7		.600									
PERQ8		.600									
PERQ9		.488									
PERQ10		.537		.401							
PERQ11		.596									
PERQ12		.547									
PERQ13	.907										
PERQ14										.724	
PERQ15	.433									.652	
PERQ16						.818					
PERQ17						.628					
PERQ18						.500					
PERQ19					.672						
PERQ20					.501						
PERQ21					.772						
PERQ22				.790							
PERQ23				.738							
PERQ24				.707							
PERQ25							.505				

Table 7. Continued

PERQ26				.489	
PERQ27				.650	
PERQ28					.674
PERQ29					.673
PERQ30					.384
PERQ31				.615	
PERQ32				.691	
PERQ33				.464	
PERQ34		.779			
PERQ35		.901			
PERQ36		.891			
PERQ37	.772				
PERQ38	.886				
PERQ39	.827				

Table 8. EFA factor loadings excluding items 37-39

Variable/ Factor	Eat	Personal- Growth/Go al-Pursuit	Physical Activity	Helping Behavior	Savoring Fantasizing	Savoring Positive Thinking	Sensation Seeking	Relax	Spiritual/ Cultural Activities	Socializing
PERQ1				.370						
PERQ2						.475				
PERQ3					.550					
PERQ4										.444
PERQ5										
PERQ6										.450
PERQ7		.711								
PERQ8		.617								
PERQ9		.476								
PERQ10		.518	.400							
PERQ11		.569								
PERQ12		.509								
PERQ13							.582			
PERQ14							.704			
PERQ15							.840			
PERQ16					.816					
PERQ17					.633					
PERQ18					.503					
PERQ19				.681						
PERQ20				.509						
PERQ21				.763						
PERQ22			.803							
PERQ23			.509							
PERQ24			.763							

Table 8. Continued

Variable/ Factor	Eat	Personal- Growth/Go al-Pursuit	Physical Activity	Helping Behavior	Savoring Fantasizing	Savoring Positive Thinking	Sensation Seeking	Relax	Spiritual/ Cultural Activities	Socializing
PERQ25						.535				
PERQ26						.490				
PERQ27						.613				
PERQ28									.659	
PERQ29									.684	
PERQ30									.392	
PERQ31								.607		
PERQ32								.697		
PERQ33								.453		
PERQ34	.787									
PERQ35	.888									
PERQ36	.902									

Table 9. Revised PERQ

The Positive Emotion Regulation Questionnaire – PERQ					
Listed below are a number of statements used to describe how teenagers might respond to different feelings and situations. Think about all the things you do when you are HAPPY. HAPPINESS can feel different in different situations. For example, when you feel joy from helping a friend, when you are excited for a trip, etc. Please read each statement below and select how often in the past year you have responded in this way when you are HAPPY.					
1. When I want to stay happy or make myself happier, I spend time with my friends. For example, hang out, talk on the phone or internet, etc.	Never Always	Rarely	Sometimes	Often	Almost
2. When I want to stay happy or make myself happier, I spend time with family. For example, do something with parents, siblings, etc.	Never Always	Rarely	Sometimes	Often	Almost
3. When I want to stay happy or make myself happier, I include others in what is making me happy. For example, tell someone about what is making me happy, invite someone to join in what is making me happy, go out to eat, etc.	Never Always	Rarely	Sometimes	Often	Almost
4. When I want to stay happy or make myself happier, I work towards a goal. For example, practice an instrument, practice a sport, etc.	Never Always	Rarely	Sometimes	Often	Almost
5. When I want to stay happy or make myself happier, I work on learning something. For example, watch tutorials, take lessons, etc.	Never Always	Rarely	Sometimes	Often	Almost
6. When I want to stay happy or make myself happier, I work on getting things done. For example, finishing tasks, organizing, etc.	Never Always	Rarely	Sometimes	Often	Almost
7. When I want to stay happy or make myself happier, I do something to improve my health. For example, work on being healthy, get better sleep, etc.	Never Always	Rarely	Sometimes	Often	Almost
8. When I want to stay happy or make myself happier, I work on forming better habits. For example, studying more, being more active, flossing, etc.	Never Always	Rarely	Sometimes	Often	Almost
9. When I want to stay happy or make myself happier, I work on breaking bad habits. For	Never Always	Rarely	Sometimes	Often	Almost

example, watching less television, eating junk food, procrastinating, etc.					
10. When I want to stay happy or make myself happier, I have a good time with drugs and/or alcohol. For example, drink or smoke with friends at a party, etc.	Never Always	Rarely	Sometimes	Often	Almost
11. When I want to stay happy or make myself happier, I do something dangerous or thrilling. For example, do a risky sport, drive fast, etc.	Never Always	Rarely	Sometimes	Often	Almost
12. When I want to stay happy or make myself happier, I do something impulsive. For example, ditch class, doing something I wouldn't normally do, etc.	Never Always	Rarely	Sometimes	Often	Almost
13. When I want to stay happy or make myself happier, I think about something in the future. For example, I think about something I am looking forward to.	Never Always	Rarely	Sometimes	Often	Almost
14. When I want to stay happy or make myself happier, I fantasize about the future. For example, picture my career or what my house will look like, etc.	Never Always	Rarely	Sometimes	Often	Almost
15. When I want to stay happy or make myself happier, I daydream. For example, visualize somewhere I want to go or something I want to do, etc.	Never Always	Rarely	Sometimes	Often	Almost
16. When I want to stay happy or make myself happier, I envision doing something I enjoy. For example, imagine playing my video game, being with people, etc.	Never Always	Rarely	Sometimes	Often	Almost
17. When I want to stay happy or make myself happier, I help people. For example, help a friend with a problem, try to make someone happy, etc.	Never Always	Rarely	Sometimes	Often	Almost
18. When I want to stay happy or make myself happier, I volunteer. For example, help in a classroom, at a shelter, etc.	Never Always	Rarely	Sometimes	Often	Almost
19. When I want to stay happy or make myself happier, I do something helpful. For example, help my family with chores, help someone with a project, etc.	Never Always	Rarely	Sometimes	Often	Almost
20. When I want to stay happy or make myself happier, I do something physical. For example, go for a run, play a sport, etc.	Never Always	Rarely	Sometimes	Often	Almost

21. When I want to stay happy or make myself happier, I do exercise. For example, go to the gym, lift weights, etc.	Never Always	Rarely	Sometimes	Often	Almost
22. When I want to stay happy or make myself happier, I do something active. For example, go for a hike, go for a walk, etc.	Never Always	Rarely	Sometimes	Often	Almost
23. When I want to stay happy or make myself happier, I focus on what is happening in the moment. For example, I focus on what is making me happy.	Never Always	Rarely	Sometimes	Often	Almost
24. When I want to stay happy or make myself happier, I think about the good things in my life. For example, my friend and family, etc.	Never Always	Rarely	Sometimes	Often	Almost
25. When I want to stay happy or make myself happier, I think about what things I like about myself. For example, my personality, things I am good at, etc.	Never Always	Rarely	Sometimes	Often	Almost
26. When I want to stay happy or make myself happier, I think positively. For example, look at the bright side, stay optimistic, etc.	Never Always	Rarely	Sometimes	Often	Almost
27. When I want to stay happy or make myself happier, I turn to spirituality. For example, I meditate.	Never Always	Rarely	Sometimes	Often	Almost
28. When I want to stay happy or make myself happier, I turn to Religion. For example, worship, pray, read, etc.	Never Always	Rarely	Sometimes	Often	Almost
29. When I want to stay happy or make myself happier, I turn to culture. For example, engage in cultural traditions, enjoy food from my culture, etc.	Never Always	Rarely	Sometimes	Often	Almost
30. When I want to stay happy or make myself happier, I do something relaxing. For example, watch TV or read a book, etc.	Never Always	Rarely	Sometimes	Often	Almost
31. When I want to stay happy or make myself happier, I do something to calming. For example, play a game, do a hobby, etc.	Never Always	Rarely	Sometimes	Often	Almost
32. When I want to stay happy or make myself happier, I do something peaceful. For example, take a bath or shower, rest, listen to music, etc.	Never Always	Rarely	Sometimes	Often	Almost
33. When I want to stay happy or make myself happier, I enjoy food. For example, go out for a favorite meal, etc.	Never Always	Rarely	Sometimes	Often	Almost

34. When I want to stay happy or make myself happier, I eat something delicious. For example, candy, ice cream, etc.	Never Always	Rarely	Sometimes	Often	Almost
35. When I want to stay happy or make myself happier, I like to eat something comforting. For example, a favorite treat, etc.	Never Always	Rarely	Sometimes	Often	Almost
SUBSCALES Socializing (items 1-3). These items reflect the degree to which an individual an individual engages in social conversation/activities to maintain or increase happiness. Personal growth (4-9). These items reflect the degree to which an individual actively works towards a goal and/or engages in activities to promote personal betterment to maintain or increase happiness. Sensation seeking (10-12). These items reflect the degree to which an individual indulges in risky behaviors use to maintain or increase happiness. Savoring/Fantasizing (13-16). These items reflect the degree to which an individual relies on fantasizing or visualization to maintain or increase happiness. Helping (17-19). These items reflect the degree to which an individual engages in helping behavior to maintain or increase happiness. Physical activity (20-22). These items reflect the degree to which an individual engages in physical activity to maintain or increase happiness. Positive thinking (23-26). These items reflect the degree to which an individual focuses on positive thoughts to maintain or increase happiness. Spiritual or Cultural activities (27-29). These items reflect the degree to which an individual engages in activities relates to spirituality, religion, or culture to maintain or increase happiness. Relaxation (30-32). These items reflect the degree to which an individual engages in activities that are calming or relaxing to maintain or increase their happiness. Eating (33-35). These items reflect the degree to which an individual engages in activities that relate to indulging in food to maintain or increase their happiness.					

Validity

Composite scores were calculated for each factor derived from the EFA by summing the respective items. Composite scores were then used to examine convergent validity with the other study variables. Correlation coefficients were calculated using SPSS 28.0 to examine relations between all 10 PERQ factors and resilience, anxiety, depression, trauma, and difficulties regulating positive emotions and significant relations ($p < .05$) were examined (see Table 10). Eating was unrelated to all outcomes; Personal growth was positively related to resilience;

Physical activity was negatively related to depression and anxiety and positively related to resilience; Helping behavior was unrelated to all outcomes; Fantasizing was positively related to anxiety; Positive thinking was negatively related to anxiety and depression and positively related to resilience; Sensation seeking was positively related to anxiety, depression, and difficulties regulating positive emotions, and negatively related to resilience; Relaxation was positively related to depression; Spiritual and cultural activities was unrelated to all outcomes; and socializing was unrelated to all outcomes.

Table 10. Correlations between PERQ factor composite scores and all measures

Variable	Anxiety	Depression	Trauma	Resilience	Difficulties
Eating	0.01	0.07	0.00	-0.09	-0.03
Personal Growth	0.02	-0.09	-0.10	0.16**	-0.09
Physical Activity	-0.07	-0.14**	-0.23**	0.18**	-0.15**
Helping Behavior	0.05	-0.04	-0.03	0.09	0.01
Fantasizing	.17**	0.10	-0.04	-0.05	0.04
Positive Thinking	-0.25**	-0.23**	-0.07	0.18**	-0.10
Sensation Seeking	.19**	.34**	0.08	-.14**	.35**
Relaxation	0.07	0.11*	-0.12	-0.08	0.04
Spiritual and Cultural Activities	0.09	0.00	-0.17	0.00	0.04
Socializing	-0.10	-0.04	-0.03	0.05	-0.01

Note: *M* and *SD* are used to represent mean and standard deviation, respectively. *indicates $p < .05$. ** indicates $p < .01$

Reliability

To evaluate reliability, Omegas were calculated for factor items. Reliability was sufficient to excellent (Dunn 2006; see Table 11).

Table 11. Omega values for PERQ factor items

Factors	Eat	Self-Improvement	Physical Activity	Helping Behavior	Fantasize	Positive Thinking	Sensation Seeking	Relax	Spiritual and Cultural Activities	Socialize
Omegas	0.92	0.81	0.85	0.74	0.76	0.68	0.76	0.65	0.67	0.54

Note: Cronbach's alpha was calculated for Socializing (two-item scale).

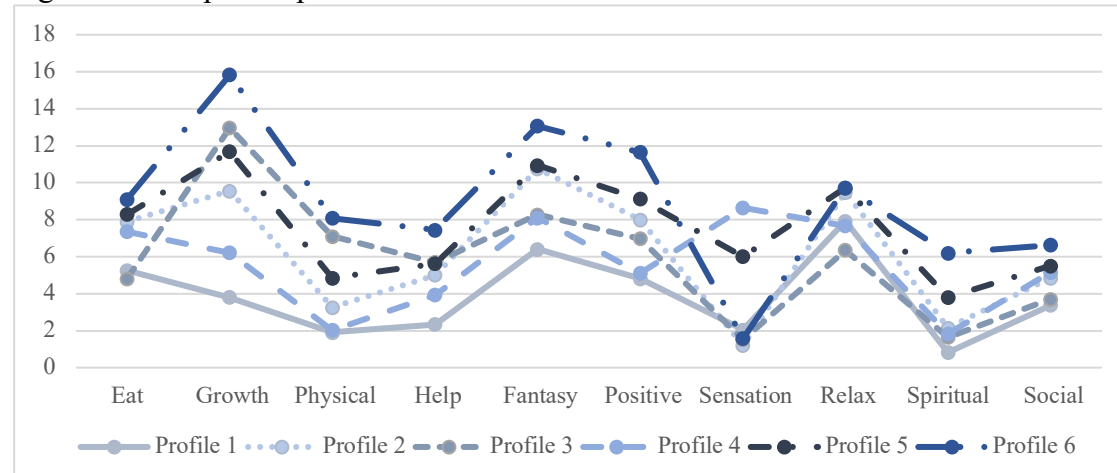
Latent Profile Analysis

Latent profile analysis results indicated a 6-profile model as the best fitting model (log likelihood ratio = -8454.15; adjusted BIC = 17109.50; entropy = .80) as compared to models with 2-5 profiles (see Table 12). As shown in Figure 5, most of the profiles were distinguished as varying in levels of strategy use (low to high) across all 10 strategies. However, three unique profiles that emerged were characterized by either mainly using personal growth strategies more frequently than other strategies (profile 3), or using more frequently sensation seeking and fantasizing as opposed to other strategies available to them (profile 4), or a combination of these three strategies (profile 5).

Table 12. Model fit statistics for LPA profiles 2-6

Profile #	Log likelihood	Adjusted BIC	Entropy
2	-8626.03	17335.23	0.62
3	-8565.90	17244.47	0.77
4	-8520.46	17183.10	0.77
5	-8489.93	17151.55	0.77
6	-8454.15	17109.50	0.80

Figure 5. LPA profile plot



LPA Profiles and Outcomes

ANOVA results indicated there was a significant impact of PERQ profile on depression ($F(5, 345) = 8.02, p < .001$), see Table 13 for means and standard deviations. Tukey HSD post hoc analyses revealed that depression was significantly lower for adolescents in profile 3 compared to profile 1 ($p = .003, 95\% \text{ CI} = -7.90, -1.06$), 4 ($p < .001, 95\% \text{ CI} = -11.42, -3.08$), and 5 ($p < .001, 95\% \text{ CI} = -8.66, -1.61$). Further, depression was significantly higher for adolescents in profile 4 compared to profile 2 ($p = .002, 95\% \text{ CI} = 1.18, 8.39$), 3 ($p < .001, 95\% \text{ CI} = 3.08, 11.42$), and 6 ($p < .001, 95\% \text{ CI} = 1.94, 11.14$). Results also indicated there was a significant impact of PERQ profile on difficulties regulating positive emotions ($F(5,342) = 6.16, p < .001$). Tukey post hoc analyses revealed higher difficulties in profile 4 compared to profiles 2, 3, and 6 ($p < .001, 95\% \text{ CI} = 2.87, 15.28$), ($p = .001, 95\% \text{ CI} = 2.71, 16.98$), and ($p < .001, 95\% \text{ CI} = 3.48, 19.09$), respectively. Tukey post hoc analyses also revealed higher difficulties in profile 5 compared to 2, 3, and 6 ($p = .023, 95\% \text{ CI} = .42, 9.77$), ($p = .049, 95\% \text{ CI} = .02, 11.72$), and ($p = .022, 95\% \text{ CI} = .66, 13.96$), respectively. Last, results indicated there was a significant impact of PERQ profile on resilience ($F(5, 341) = 3.13, p = .002$). Tukey post hoc analyses revealed that profile 4 was significantly lower in resilience compared to profiles 2, 3, 5, and 6 ($p = .042, 95\% \text{ CI} = -6.36, -.07$), ($p = .001, 95\% \text{ CI} = -8.60, -1.40$), ($p = .025, 95\% \text{ CI} = -7.50, -.29$), and ($p = .025, 95\% \text{ CI} = -8.25, -.34$), respectively.

Table 13. Means and standard deviations (*SD*) of profiles and anxiety and depression

Profile	Mean	<i>SD</i>
<u>Anxiety</u>		
Profile 1	12.04	5.55
Profile 2	11.73	5.55
Profile 3	10.71	5.19

Table 13. Continued

Profile 4	13.22	4.88
Profile 5	13.59	5.00
Profile 6	10.68	6.13
Depression		
Profile 1	14.59	5.79
Profile 2	12.58	5.83
Profile 3	10.11	5.50
Profile 4	17.36	5.43
Profile 5	15.24	5.95
Profile 6	10.82	6.54

PERQ Effectiveness

As this was an optional measure, 268 out of 349 participants chose to take the survey. Table 14 provides a description of the percentage of adolescents who responded to each question as respondents had the option to select that they prefer not to answer, or they do not use the particular strategy the item was referring to. These were treated as missing data. Factor scores were then calculated for the PERQ-E as well as correlations for measures of depression, anxiety, resilience, and difficulties regulating positive emotions (see Table 15). Results revealed significant negative correlations ($p < .05$) between personal growth, physical activity, and positive thinking and anxiety and depression. Further, there was a significant positive correlation between sensation seeking and depression and socializing and anxiety. Personal growth and physical activity were positively related to resilience and negatively related to difficulties regulating positive emotions. Last, sensation seeking was positively related to difficulties regulating positive emotions and relaxation and socializing were negatively related to difficulties regulating positive emotions. Considering the similar results surrounding substance use for the PERQ as well as the representation of substance use within this factor, to ensure that the

substance use item was not driving the relations for this factor, the factor score was re-calculated excluding the substance use items and correlations were revisited. For the PERQ, results indicated that sensation seeking was significantly related to the GAD-7 ($r = .19$), PHQ-8A ($r = .32$), DERS-P ($r = .38$), and BRS ($r = -.11$), even while excluding substance use. However, this was not true for the PERQ-E, without the substance use item, the significant relation between sensation seeking and depression decreased to $r = .13$. There were no significant relations between this factor score and trauma endorsements.

Table 14. Percentage of PERQ-E item completion

Item	% preferred not to answer	% do not use strategy	Mean	<i>SD</i>
PERQ-ES1	0.6%	10.9%	1.3	0.79
PERQ-ES2	0%	8.0%	1.71	0.94
PERQ-ES3	0%	6.6%	1.79	0.91
PERQ-ES4	0%	2.6%	2.14	0.93
PERQ-ES5	0.6%	9.7%	1.23	0.88
PERQ-ES6	0.3%	11.7%	1.69	1.00
PERQ-ES7	0.3%	17.5%	1.5	0.90
PERQ-ES8	0.3%	19.2%	1.48	0.94
PERQ-ES9	0.3%	14.3%	1.7	0.90
PERQ-ES10	0.3%	19.2%	1.44	0.94
PERQ-ES11	0.3%	22.3%	1.37	0.92
PERQ-ES12	0.6%	24.4%	1.27	0.93
PERQ-ES13	1.1%	48.1%	1.05	1.15
PERQ-ES14	0.6%	36.7%	1.3	1.04
PERQ-ES15	0.6%	30.7%	1.18	1.00
PERQ-ES16	0.35%	8.9%	1.83	1.02
PERQ-ES17	0.35%	7.2%	2.04	0.92
PERQ-ES18	0	10.3%	1.64	0.93
PERQ-ES19	0.3%	13.5%	1.7	0.94
PERQ-ES20	0.9%	30.7%	1.55	0.97
PERQ-ES21	0	18.3%	1.33	0.90
PERQ-ES22	0	26.6%	1.63	0.97
PERQ-ES23	0.9%	32.7%	1.56	1.01
PERQ-ES24	0.6%	18.9%	1.81	0.95
PERQ-ES25	0.9%	8.9%	1.51	0.90
PERQ-ES26	0.6%	23.8%	1.16	0.87
PERQ-ES27	0.6%	15.2%	1.28	0.90

Table 14. Continued

PERQ-ES28	0.9%	37.2%	1.36	1.01
PERQ-ES29	0.9%	46.1%	1.36	1.12
PERQ-ES30	1.4%	39.3%	1.39	0.95
PERQ-ES31	0.6%	1.7%	2.13	0.80
PERQ-ES32	0	2%	2.13	0.81
PERQ-ES33	0.3%	3%	2.16	0.85
PERQ-ES34	0.3%	8.3%	1.81	0.92
PERQ-ES35	0.3%	7.2%	1.8	0.95
PERQ-ES36	23.2%	6.3%	1.9	0.95
PERQ-ES37	0.6%	54.7%	0.71	0.98
PERQ-ES38	0.9%	53%	1.18	1.22
PERQ-ES39	0.9%	57.9%	0.78	1.07

Notes: Participants were asked to indicate how effective they believe each strategy is on a scale from 0-4 (0 being not at all and 4 being extremely).

Table 15. Correlations between PERQ effectiveness factors and sepression and anxiety

	Depression	Anxiety	Resilience	Difficulties
Eating	0.03	-0.02	.00	-.06
Personal Growth	-.22**	-.23**	.19*	-.18*
Physical Activity	-.32**	-.32**	.25**	-.28**
Helping Behavior	-0.14	-0.15	.03	.01
Fantasizing	-0.07	0.02	.01	-.06
Positive Thinking	-.26**	-.26**	.13	-.14
Sensation Seeking	.23*	0.05	.09	.23*
Relaxation	-0.10	-0.12	.05	-.13*
Spiritual or Cultural	-0.08	0.01	-.05	-.16
Socializing	-0.13	-.17*	.10	-.15*

DISCUSSION

Previous measures assessing positive emotion regulation (ER) strategies tend to focus on a limited number of strategies (i.e., 2-5), such as savoring (Quoidbach et al., 2010). The primary aim of this study was to validate a positive ER measure assessing a much wider range of at least 13 strategies derived from previous theory and research (Feldman et al., 2008; Kostiuk, L. M., 2011; Livingstone & Srivastava, 2012; Nelis et al., 2011; Nezlek & Kuppens, 2008; Strauss et al., 2016; Weiss et al., 2019; McCullen et al., 2020). Although the results showed initial support for only 10 of the 13 hypothesized positive ER strategies, participants endorsed using all 13 strategies. Specifically, 15.7% to 97.9% stated they at least rarely used these strategies. These findings make an incremental contribution to the positive ER literature by demonstrating the PERQ as a reliable and valid measure to assess 10 distinct positive ER strategies among adolescents.

The EFA results revealed a factor structure similar to the hypothesized factors tested in the CFA models except for savoring, substance use, and sensation seeking strategies. There are a few possible explanations for why there was no support for these specific strategies in this study. First, factor analyses pointed toward a high linear dependency between the sensation seeking and substance use latent factors. Examination of the item wording revealed that the language of the substance use item hypothesized to load onto sensation seeking overlapped considerably or was redundant with the three substance use items. However, the removal of this item did not improve the separation of the sensation seeking and substance use factors in subsequent analyses. As such, it seemed most reasonable to remove the substance use items from further analysis given the lower base rate of endorsement on these items as compared to the sensation seeking items.

Second, it is possible that the savoring items are more distinct than anticipated (i.e., do not load onto one factor) or possibly better assess other underlying constructs. I modeled the three savoring items after Bryant's (2003) Savoring Beliefs Inventory (SBI), which was intended to capture three related aspects of savoring: anticipation, reminiscing, and savoring the moment. However, it is possible that each item represented a distinct domain of savoring. It is also possible that the items were too qualitatively similar to fantasizing and positive thinking which could be due to a lack of clarity in the design of the questions themselves or the concepts of fantasizing versus savoring-anticipation and positive thinking and savoring the moment are not distinct enough to be differentiated. The reminiscing item, however, loaded onto a factor with no conceptual basis, which was likely due to chance rather than a conceptually meaningful loading.

Results also suggested that each of the positive ER strategies was mostly reliable and demonstrated acceptable to excellent internal consistency for the distinct scales. The only scale with a lower reliability estimate was socializing, which consisted of two versus three or four items. Previous studies have shown that scales with fewer than three items tend to have lower internal consistency estimates (Eisinga et al., 2013). It will be important for future research to add at least one additional item to this scale to potentially improve its internal consistency and validity. The findings also showed partial support for the convergent validity of the PERQ by certain strategies correlating with resilience, mental health problems, and difficulties in positive ER measures in the expected direction. Specifically, findings showed that adolescents who were more resilient engaged in greater self-improvement, physical activity, and positive thinking. Similarly, adolescents with less anxiety reported using more positive thinking, and adolescents with less depression reported using more positive thinking and physical activity. Altogether,

these findings are in line with past research that has shown cognitive-behavioral models have incorporated physical activity and positive reappraisal in the treatment of anxiety and depression (Hallgren et al., 2015; Min et al., 2013).

Results also revealed correlations in unexpected directions. First, adolescents who engaged in more sensation seeking also endorsed higher levels of anxiety, depression, less resilience, and difficulties regulating positive emotions. This is consistent with past theory and research that has shown sensation seeking to be associated with negative outcomes, such as depression (Ortin et al., 2012) and poor cognitive control during emotion regulation processes (Deng & Zhang, 2020; Inzlicht et al., 2015; Yu et al., 2018). Second, adolescents who engaged in more fantasizing also reported higher levels of anxiety. It is possible that engaging in fantasizing may contribute to increases in adolescents' anxious arousal as it may activate replaying stressful or anxious scenarios which could promote worrying and other negative thought patterns (Somer & Herscu, 2017). Third, adolescents who engaged in more relaxation reported higher levels of depression. Adolescents who are depressed may already have difficulty approaching situations or finding interest in daily activities and engaging in relaxation strategies may provide a greater opportunity to engage in rumination and negative thought patterns that increase depressive symptoms (McLaughlin & Nolen-Hoeksema, 2011; Watson et al., 2020).

It also is important to note that there were no significant relations between eating, helping behavior, spiritual and cultural activities, and socializing and any of the outcomes. One possible reason for these non-significant findings could be that adolescents who are prone to emotional dysregulation may use these strategies more often to reduce negative emotions (e.g., anxiety) than maintain positive emotions. For example, eating among anxious and depressed individuals

may be used to decrease a negative emotion, such as fear and sadness, rather than to maintain a positive one (Dingemans et al., 2017; Macht & Simons, 2000). Moreover, adolescents may tend to help others when feeling certain moral emotions (i.e., guilt; Miller, 2010) or call on a higher power (religious coping) during times of distress (external versus internal support), but not engage in this practice when they are already happy. Another possible reason could be that these strategies are not effective in reducing anxiety and depression or building resiliency. Research indicates that the pursuit of happiness can be a delicate process, and although the potential benefits are worthwhile, the processes that individuals engage in to pursue happiness may not work as intended (Catalino et al., 2014; Parks et al., 2012; Zerwas & Ford, 2021). Altogether, future research will need to explore these strategies among clinical and emotionally dysregulated samples and in conjunction with emotion regulation of negative emotions to gain a better understanding of their unique and interactive associations with resilience and internalizing problems.

The person-centered analyses showed that six profiles emerged with most of them being distinguishable by varying levels of strategy use (low to high) across all 10 strategies. However, three unique profiles emerged characterized by more frequently using personal growth strategies (profile 3), using sensation seeking and fantasizing strategies (profile 4), or a combination of personal growth, sensation seeking, and fantasizing strategies (profile 5). Results suggested that adolescents with the personal growth profile (profile 3) may be protected from experiencing depressive symptoms, but not anxiety. It could be that seeking personal growth to maintain happiness may combat core aspects of depression, such as having a lack of interest in activities (APA, DSM-5, 2013; Watson et al., 2020). Conversely, adolescents with the sensation seeking

and fantasizing profile (profile 4) may be at risk for depression, lower resilience, and greater difficulties regulating positive emotions. These findings align with the validity results showing positive relations between these two individual factors and depressive symptoms. Interestingly, adolescents with a personal growth, sensation seeking, and fantasizing profile (profile 5) may experience more difficulties in regulating positive emotions but did not experience more anxiety or depression than other profiles. This profile is unique in that this subset of adolescents utilizes a combination of strategies that may be considered both protective and problematic, which may reflect disorganized emotion regulation strategy use, leading to difficulties regulating positive emotions. However, the addition of personal growth engagement may serve to protect them from experiencing greater depression (i.e., lack of engagement).

Taken together, these results revealed that subsets of adolescents use different combinations of strategies with varying frequency to achieve the goal of maintaining or upregulating happiness. These results highlight some combinations of strategies that can potentially impact mental health. Further, the findings appeared to highlight unique relations to depression but not anxiety. This aligns with the tripartite model of anxiety and depression (Clark & Watson, 1991), indicating that although depression and anxiety are comorbid in many contexts, they are also separable in that depression is a disorder of positive affect whereas anxiety is not.

A preliminary examination of each strategy's subjective effectiveness in maintaining and increasing happiness revealed that most adolescents endorsed at least some effectiveness of each strategy. Specifically, with the exception of the substance use items, all items had at least 50% endorsement of strategy use with some effectiveness in helping them achieve their goal. Many of

the convergent validity results were consistent with the PERQ findings, such that personal growth and physical activity were related to resilience, physical activity was related to depression and difficulties regulating positive emotions, positive thinking was related to anxiety and depression, and sensation seeking was related to depression and difficulties regulating positive emotions. Inconsistent with the PERQ, adolescents who perceived personal growth to be effective also endorsed lower levels of depression, anxiety, and difficulties regulating positive emotions. Moreover, adolescents who perceived physical activity to be effective also endorsed lower levels of anxiety. In the opposite direction, adolescents who perceived socializing to be effective also endorsed more anxiety and difficulties regulating positive emotions. Further, relaxation was no longer related to depression but adolescents who perceived relaxation to be effective also endorsed higher levels of difficulties regulating positive emotions. Some relations present for the PERQ were no longer present for the PERQ-E, specifically, fantasizing was not related to anxiety, positive thinking was not related to resilience, and sensation seeking was not related to anxiety or resilience.

The PERQ-E appeared to yield many relations with stronger effect sizes between the effectiveness of strategy use with mental health and resilience variables, which may suggest effectiveness may be more sensitive to predicting adolescents' strengths and difficulties than just frequency of strategy use. Further, it suggests that assessing use and effectiveness separately may be valuable in future applications of screeners as it can provide a qualitative component to assessment while still utilizing a self-report questionnaire format.

LIMITATIONS AND FUTURE DIRECTIONS

Although partial support for the PERQ measure was found, there are several limitations to this study. First, the method of online recruitment and use of Facebook algorithms to target advertisements (i.e., optimizing for audience via Facebook AD optimization) may have introduced unintentional selection bias into the sample. Second, the sample consisted of adolescents who may not be completely representative of adolescents in the United States population. However, it was unique in that there was a higher representation of non-binary, non-cis gendered, and non-heterosexual youth as well as youth who endorse having experienced a traumatic event in their lifetime. Future research should investigate the impact of algorithms in youth-targeted social media advertisement for studies and investigate potentially unique aspects of emotion regulation strategy use in youth who may encounter different challenges. Further, future research should aim to assess this measure in a sample representative of the population. Third, this study utilized a cross-sectional and bi-directional design. Future studies should investigate the relations among positive ER and outcomes using longitudinal designs.

Fourth, the language and wording of the items may have unknowingly influenced the findings. Future studies should evaluate the decisions made involving reminiscing, substance use, and savoring by including a three-item reminiscing factor to test in a subsequent CFA, replacing the substance use sensation seeking item with an additional sensation seeking item (not-involving substance use) and reintegrating substance use separately, and by asking youth to report on their perception on qualitative differences between savoring the moment and positive thinking and savoring the future and fantasizing. A fifth limitation also related to language and wording, is related to the question stems. The intention of this measure is to assess maintaining

and upregulating (enhancing) positive emotions, however, the portion of the question stem referring to enhancing positive emotions can possibly be interpreted as asking what is done to increase happiness when the present emotion is not positive. The next iteration of this measure should focus on positive emotion maintenance. The sixth and final limitation involves the emotion focus. The decision to focus on happiness and joy was a result of youth testimony that these are the most important emotions to experience and maintain. This measure does not assess secondary positive emotions such as pride and love or emotions that are more stable, such as contentment, and assessing emotion context beyond happiness would provide further insight into the role of emotions and strategies used to regulate them and mental health. Moreover, further studies should evaluate how frequently the emotion intended to be measured is experienced by the respondent.

IMPLICATIONS

The current project has two primary real-world applications. The first potential application is in the area of screening. Specifically, understanding strategy use repertoire can potentially enhance emotion-focused interventions (i.e., cognitive behavioral therapy; Berking et al., 2008). For instance, understanding that youth who utilize more sensation seeking and fantasizing compared to other strategies also experience more depression and less resilience sheds light on potential maladaptive patterns of positive ER strategies that may inform intervention. Whereas the indication that positive thinking strategies appear to be protective can also serve as potential adaptive strategies to assist individuals in incorporating or refining. Thus, the PERQ may serve as a tool to assist in identifying specific strategies that are utilized, how effective those strategies are perceived to be, and the impacts on mental health.

Directly related to screening, another potential application is in the area of mental health interventions. Results indicating relations between specific factors and profiles and mental health constructs can further inform mental health intervention utilizing positive ER strategies. Emotion regulation strategy training has been shown to be a modifiable component of cognitive-behavioral interventions intended to target various psychopathology (Daniel et al., 2020). Specifically, intervention participants can replace ineffective strategies with more effective ones or begin using specific strategies that are not in their repertoire. At this point, interventions that assess and include a limited number of positive emotion regulation strategies have been assessed in adults (Weytens et al., 2014), thus, the current project may offer valuable information to researchers and clinicians interested in making these interventions transportable to youth as well as broadening the scope of their strategy targets.

CONCLUSION

In conclusion, the main hypotheses of this study were partially supported. Specifically, the factor structure revealed clusters similar to what was expected with items yielding acceptable to excellent reliability. The validity results were mixed, as some factors related to resilience, anxiety, and depression as expected whereas others did not. Last, exploratory analyses revealed unique profiles which potentially highlight frequencies of specific strategies which may serve as risk factors and frequencies of specific strategies with potential protective value.

This study made an incremental contribution to the current literature on positive emotion maintenance strategies in youth in that it highlighted just how many strategies youth endorse using for this purpose. Further, this information is valuable in that it is among the first studies to evaluate positive emotion regulation profiles in youth with such a wide representation of strategies showing unique patterns of positive ER strategy use with impacts on mental health. These findings also extend prior research (Young et al., 2019) and suggest that certain positive ER profiles may indicate protective (high personal growth only) or risk (high sensation seeking and fantasizing) for experiencing depressive symptoms and suggest that certain positive ER strategies may potentially serve as protective or risk factors for resilience and internalizing problems. Further, the perceived effectiveness of the strategy at maintaining or increasing happiness may have a greater effect on mental health compared to the frequency of use and although some strategies may be perceived as effective in maintaining and increasing positive emotions, they may have unforeseen consequences.

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