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Protective Factors Associated with Daily Affective Reactivity and Instability During Adolescence

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Abstract

The daily emotional experiences of adolescents are dynamic, vary significantly across individuals, and are crucial to their psychological adjustment, warranting a need to identify factors that promote adaptive affective responses to stressors and attenuated affective instability. The objective of this study, therefore, was to examine protective factors linked to individual differences in daily affective reactivity and instability utilizing a daily diary design in a national sample of 100 U.S. adolescents (13-17 years; 40% girls; 79% White). Adolescents completed a baseline survey and then 14 daily online surveys. Better mother-adolescent communication predicted lower negative affect reactivity, whereas greater use of problem-focused coping strategies predicted higher positive affect reactivity. Greater trait resilience and instrumental support seeking predicted lower negative affect instability. Conversely, more emotional support seeking predicted higher negative affect instability. No factors were associated with positive affect instability, and father-adolescent communication was unrelated to daily affective reactivity and instability. The findings implicate specific protective factors associated with distinct aspects of affective reactivity and instability.

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Keywords

emotion regulation; affective reactivity; affective instability; adolescents; resilience; coping; parent-adolescent communication

Introduction

Emotional development represents a central task of adolescence because it is vital to day-to-day functioning and general well-being, as emotions play a critical role in shaping motivations, directing attention, influencing attitudes and behaviors, and facilitating relationships (Gross, 2013). Dimensional models of affect, such as the Circumplex Model, conceptualize emotions in terms of both valence, which includes positive and negative dimensions, and the degree of arousal or intensity (Posner, Russell, & Peterson, 2005). In line with these models, adolescents' daily emotional experiences are dynamic as a result of affective states' frequent shifting in their valence and intensity and being modulated continuously in response to salient stimuli (Heller & Casey, 2016). Two core components comprising these temporal emotional dynamics include affective reactivity and affective instability. Affective reactivity refers to the tendency to be easily physiologically aroused and experience greater increases in affective states in response to concrete, emotionally laden events (Spear, 2009). Affective instability often is described as an "emotional roller coaster," and is defined as the tendency to experience marked, yet unexpected, fluctuations in the intensity of affective states (Renaud & Zacchia, 2013). These constructs are conceptualized as emotion dysregulation indices that primarily reflect problematic emotional intensity processes that unfold over time, which result from a combination of extreme affective reactivity and ineffective attempts to regulate emotions (Heller & Casey, 2016). It also is important to consider both negative and positive valence aspects of affective reactivity and instability because dimensional models of affect suggest that they serve distinct functions, with negative affect initiating avoidance-related motivations and positive affect eliciting approach-related motivations (Posner et al., 2005).

Adolescence is an opportune time to study affective reactivity and instability. Neurodevelopmental models of emotion propose that, relative to children and adults, adolescents are especially vulnerable to increased affective reactivity and instability in both negative and positive valence domains due to puberty-induced changes to brain structure and function as well as shifting social contexts (Casey, Jones, & Hare, 2008). As part of normative neural development, adolescents experience exaggerated subcortical limbic and reward system activation upon exposure to salient unpleasant stimuli (e.g., social rejection) and pleasurable incentives (e.g., alcohol, risk-taking behaviors), respectively (Heller & Casey, 2016). This enhanced "bottom-up" affective processing of emotionally valenced stimuli manifests as exacerbated negative and positive affect reactivity, and contributes to affective instability via frequent, intense emotional reactions to oft-changing contextual stimuli. Yet, adolescents also have inefficient "top-down" cognitive control capabilities that impede their ability to modulate these intense emotional responses because the prefrontal cortex matures at a slower pace, which results in more intensified affective responses and/or extreme affect fluctuations (Heller & Casey, 2016). As a result of this neural imbalance, for

example, an individual may experience greater anger, anxiety, or depression following social rejection during adolescence as compared to other developmental periods coupled with difficulty in implementing effective coping and emotion regulation strategies that serves to worsen the negative affect. In addition, the social re-orientation of adolescent relationships, including the heightened importance of peer acceptance and establishing autonomy from family members, leads to an increased frequency and salience of daily conflicts with others, representing a key contextual factor hypothesized to contribute to exacerbated affective reactivity and instability (Casey et al., 2008). Overall, it seems essential to identify other psychosocial factors that influence affective reactivity and instability among adolescents to learn how to optimize emotional development during this vulnerable period.

Although adolescents tend to exhibit intense and ever-changing emotional states as a developmental age group, substantial between-person, individual differences in affective reactivity and instability are observed among adolescents (Heller & Casey, 2016). Of note, the experience of negative affective states and some affective variability is expected as part of normative emotional responses to contextual stimuli (Cole & Hall, 2008). According to emotion dysregulation theories, however, individuals who tend to experience intensified negative affect increases and positive affect decreases following even mild daily stressors and/or heightened instability in positive or negative affect are considered to have maladaptive emotion dysregulation, increasing risk for psychopathology (Beauchaine, 2015; Gilbert, 2012). Specifically, such extreme affective reactivity and instability are hypothesized to amplify adolescents' vulnerability to emotional problems, maladaptive coping strategies, behavioral dysregulation, and the negative effects of stressors, resulting in many forms of psychopathology (Heller & Casey, 2016). Consistent with these theories, adolescents with exaggerated increases in negative affect in response to stressors and high negative affect instability are predisposed to anxiety, depression, eating disorders, substance abuse, non-suicidal self-injury, and suicidality (Beauchaine, 2015; Cole & Hall, 2008; Vannucci et al., 2015). Most prior emotion dysregulation theories and research have focused on the negative affect valence dimension. Yet, recent studies suggest that individual differences in *positive* affect reactivity and instability, specifically exaggerated decreases in positive affect following stressors and high positive affect instability, also are related to these problems and may be uniquely linked to an increased risk for bipolar disorder and externalizing problems (Gilbert, 2012). Given the host of adverse outcomes linked to emotion dysregulation, it is crucial to elucidate factors associated with individual differences in affective reactivity and instability among adolescents. This novel knowledge would allow would allow for personalized intervention strategies to be developed, which has the potential to improve emotional development, decrease risk for psychopathology, and enhance the general well-being of adolescents.

Development of Affective Reactivity and Instability

Given the host of adverse outcomes stemming from emotion dysregulation among adolescents, several developmental models have been put forth to understand why individual differences in affective reactivity and instability emerge (Beauchaine, 2015; Renaud & Zacchia, 2013; Spear, 2009). Affective reactivity and instability are conceptualized as inherited temperamental traits with neurophysiological underpinnings that are influenced by

individual- and interpersonal-level experiences (Renaud & Zacchia, 2013; Spear, 2009). These models identify three key psychosocial factors that are salient to the development of individual differences in these emotion dysregulation indices, including child temperament, coping abilities, and parent-child relationships. Specifically, facets of temperament (e.g., negative affectivity), coping (e.g., rumination, suppression), and parent-child relationship quality (e.g., conflict, attachment) have been proposed to interact dynamically with each other and with inherited neurophysiological and developmental factors (e.g., puberty, social contexts) to influence the development of individual differences in affective reactivity and instability (Heller & Casey, 2016; Renaud & Zacchia, 2013). Notably, these models adopt a deficit-centric approach focused on potential risk factors that promote exaggerated affective reactivity and instability, likely due to the centrality of emotion dysregulation in theories of psychopathology (Beauchaine, 2015).

This deficit-centric bias in existing developmental models of emotion dysregulation may be limited in light of the increasing focus on theories of positive youth development and identifying strengths and protective factors that optimize development (Lerner, Lerner, Bowers, & Geldhof, 2015). Positive youth development theories identify self-regulation, including emotion regulation, as a core strength that facilitates positive developmental outcomes, such as competence, character, and social connection, and decreases the risk for psychopathology (Lerner et al., 2015). Similar to developmental models of emotion dysregulation (Beauchaine & Zisner, 2017), positive youth developmental theories suggest that there is a complex, continuous interplay among individual and contextual factors that jointly influence individual differences in self-regulation (Lerner, 2015). However, positive youth development theories do not propose specific constructs or pathways to optimal emotional development. To incorporate the key tenets of positive youth developmental theories into developmental models of emotion dysregulation, it is important for research to consider positive aspects of individual- and interpersonal- level factors related to temperament, coping, and parent-child relationships that may promote adaptive emotion regulation among adolescents. Such advances would yield significant knowledge for understanding typical and atypical emotional development during adolescence and increasing specificity for developmental models of emotion dysregulation, positive youth development theories, and emotion dysregulation theories of psychopathology.

Individual-Level Protective Factors

To be consistent with developmental models of emotion dysregulation (Renaud & Zacchia, 2013; Spear, 2009), the current study examined individual-level factors related to temperament and coping that may contribute to the adaptive development of individual differences in affective reactivity and instability during adolescence. Specifically, this study focused on trait resilience and problem-focused coping strategies, which are two constructs that have been discussed extensively in the positive youth development literature.

Trait resilience.—Trait resilience refers to an inherited, relatively stable aspect of temperament characterized by the ability to adapt to, persist through, recover from, and thrive in response to stress and adversity (Maltby, Day, & Hall, 2015). Models of resilience propose that trait resilience either enhances other protective factors or diminishes risk factors

to produce adaptive outcomes (Fergus & Zimmerman, 2005). Trait resilience is demonstrated by an individual's ability to respond adaptively to stressors and to maintain psychological stability or experience growth following stressors (Maltby et al., 2015). As such, it is conceivable that higher levels of trait resilience contribute to reduced negative affect reactivity to stressors, increased positive affect reactivity to stressors, and less affective instability. Preliminary research in adults supports these hypotheses, as individuals with higher levels of trait resilience exhibit lower negative affect and physiological reactivity to, and greater recovery from, laboratory stressors (Lü, Wang, & You, 2016). Greater positive affect reactivity to a laboratory stressor also has been associated with higher trait resilience among undergraduate students (Corral-Frías, Nadel, Fellous, & Jacobs, 2016). However, no studies have examined trait resilience in relation to affective reactivity among non-college adolescents or affective instability at any age, nor have any studies occurred outside the laboratory.

Problem-focused coping.—Adolescents' ability to cope with stressors may be another important individual-level protector factor for the development of affective reactivity and stability. Problem-focused coping encompasses purposeful strategies geared toward directly resolving stressors appraised as being threatening, harmful, or challenging, including *planning* for possible solutions and *active problem solving* to modify the circumstances generating the stressor (Lazarus & Folkman, 1984). Problem-focused coping is hypothesized to serve as an effective means for adapting to and mitigating the negative effects of controllable stressors (Zimmer-Gembeck & Skinner, 2016). Moreover, problem-focused coping has been proposed to generate greater increases in positive affect in response to stressors because such strategies allow individuals to experience efficacy, competency, mastery, and control (Folkman & Moskowitz, 2000). Indeed, use of problem-focused coping strategies has been associated with adaptive physiological stress responses and reduced negative affect reactivity to stressors in the laboratory and natural environment among adolescents (Galla & Wood, 2015; Sladek, Doane, Jewell, & Luecken, 2017). Studies have yet to examine problem-focused coping in relation to positive affect reactivity and affective instability during any developmental period.

Interpersonal-Level Protective Factors

As described above, developmental models of emotion dysregulation emphasize the role of coping and parent-child interactions as salient etiological factors for the development of individual differences in affective reactivity and instability (Renaud & Zacchia, 2013; Spear, 2009). Social connection represents a crucial aspect of positive youth development theories (Lerner et al., 2015). As such, the current study also focused on interpersonally-oriented coping strategies aimed at seeking social support and healthy parent-adolescent communication as interpersonal-level protective factors.

Support seeking coping.—Social support seeking encompasses coping strategies geared toward harnessing the resources of others in response to stressors (Zimmer-Gembeck & Skinner, 2016). The two primary social support seeking strategies are: 1) *instrumental support seeking*, which involves soliciting advice and assistance with planning, decision-making, and problem solving; and 2) *emotional support seeking*, which involves asking for

comfort, validation, and empathy from others regarding negative emotions stemming from stressors (Zimmer-Gembeck & Skinner, 2016). Social support seeking strategies are theorized as adaptive methods for buffering the negative effects of stressors and promoting affective stability (Zimmer-Gembeck & Skinner, 2016). There is a large body of literature demonstrating that perceived availability of social support is associated with attenuated reactivity to laboratory stressors in neuroimaging and psychophysiological paradigms (Hostinar, Sullivan, & Gunnar, 2014). However, research on the relationship between *seeking* social support and affective reactivity and instability is sparse, and initial findings in adults are equivocal (Hahn, 2000; Sladek et al., 2017).

Parent-adolescent communication.—Parent-adolescent communication characterizes exchanges between parents and adolescents, with healthy communication encompassing open, mutual, and supportive interactions (Barnes & Olson, 1985). Healthy communication patterns between parents and adolescents are posited to facilitate emotion identification, expression, and regulation skills through the modeling of adaptive emotional processes and providing guided, supportive instruction for adolescents to understand and cope with affective states (Laursen & Collins, 2004). Indeed, studies have repeatedly demonstrated the stress buffering effect of parental support (e.g., Lippold, Davis, McHale, Buxton, & Almeida, 2016; Zhang, Baams, van de Bongardt, & Dubas, 2018). As such, healthy parent-adolescent communication likely contributes to decreased negative affect reactivity and affective instability. However, studies have yet to examine these relationships. Notably, adolescents' communication with mothers tends to be more open and of better quality than with fathers (Smetana, Metzger, Gettman, & Campione-Barr, 2006), likely because mothers' tend to place greater emphasis on emotional experiences, provide more encouraging reactions to negative affect, and engage in more discussions about emotions (Brand & Klimes-Dougan, 2010). The effect of healthy parent-adolescent communication on affective reactivity and instability, therefore, may be more pronounced for mother-adolescent communication than for father-adolescent communication.

Daily Diary Studies of Affective Reactivity and Instability

The primary distinguishing feature of both affective reactivity and instability is the temporal emotional dynamics, which is referred to as the shifts in emotional intensity over a relatively brief period of time within an individual (Heller & Casey, 2016). As such, individual differences in affective reactivity and instability represent between-person differences in the degree to which within-person emotional intensity changes over time. Yet, most studies that have examined developmental factors associated with individual differences in affective reactivity and instability have assessed these emotion dysregulation indices using methods that are insufficient with regard to the temporal sensitivity and ecological validity, including retrospective self-reports or laboratory stress paradigms. The use of retrospective self-reports may be problematic because individuals with higher levels of affective reactivity and instability tend to have emotional identification problems, poor insight, and negative recall biases (Myin-Germeys et al., 2009; Renaud & Zacchia, 2013). Furthermore, only modest agreement has been found between momentary and retrospective assessments of affective reactivity and instability (Myin-Germeys et al., 2009; Trull, Lane, Koval, & Ebner-Priemer, 2015). Although laboratory studies capture momentary emotional processes and objective

neurophysiological correlates, they assess only one time point and lack ecological validity (Myin-Germeys et al., 2009). To minimize limitations related to temporal sensitivity and enhance ecological validity of emotion dysregulation assessments, daily diary methods have become increasingly common in studies of affective reactivity and instability (Trull et al., 2015).

Many studies have used daily diary methods to describe the overall within-person relationships between salient stimuli (e.g., conflict) and affective states, or affective reactivity, in adolescents summarized for a given sample (e.g., Chung, Flook, & Fuligni, 2011; Vannucci, Ohannessian, Flannery, De Los Reyes, & Liu, 2018). Despite the fact that daily affective reactivity and instability are conceptualized as inherited temperamental traits that vary across individuals (Renaud & Zaccchia, 2013; Spear, 2009), little daily diary research has focused on between-person, individual differences in these emotion dysregulation indices. Several studies have found that greater affective reactivity and instability is concurrently and prospectively linked to adolescents' internalizing and externalizing symptoms (Bai & Repehi, 2018; Herres, Ewing, & Kobak, 2016; Robles et al., 2016). However, only four known daily diary studies have examined factors hypothesized to be involved in the development of individual differences in affective reactivity and instability in adolescents. At the individual-level, more frequent use of problem-focused coping strategies have been associated with attenuated negative affect reactivity (Galla & Wood, 2015), whereas difficulties with emotional clarity, impulse control, and emotional acceptance have been linked to greater positive and negative affect instability (Neumann et al., 2011). With regard to interpersonal-level factors, higher perceived parental warmth and more positive parenting behaviors have been associated with reduced negative affect reactivity to daily stressors (Lippold et al., 2016; Oppenheimer et al., 2016). Additional daily diary research is needed to elucidate individual- and interpersonal-level factors that contribute to individual differences in daily affective reactivity and instability during adolescence to further advance developmental models of emotion dysregulation and identify novel protective factors that optimize adolescents' emotional development.

The Current Study

Emotion dysregulation of both negative and positive emotions exerts a profound influence over adolescents' daily functioning and general well-being. Two primary indices of emotion dysregulation, exaggerated affective reactivity and instability, confer risk for a host of psychopathology outcomes in adolescents regardless of the emotional valence. Moreover, adolescence is an ideal time to study individual differences in affective reactivity and instability due to exacerbations in emotion dysregulation among vulnerable youth as a result of normal developmental processes (Heller & Casey, 2016; Spear, 2009). To understand the mechanisms through which exacerbated emotion dysregulation is conferred and identify effective intervention strategies, it is crucial to identify protective factors that influence individual differences in daily affective reactivity and instability during adolescence. Such information also would provide needed specificity to developmental models of emotion dysregulation, emotion dysregulation theories of psychopathology, and positive youth development theories. Developmental models of emotion dysregulation propose that aspects of temperament, coping, and parent-adolescent relationships are key contributors to the

development of individual differences in daily affective reactivity and instability (Renaud & Zacchia, 2013; Spear, 2009). Moreover, the use of daily diaries and related methodologies are ideal for studying emotional dynamics, specifically affective reactivity and instability, due to the intensive, repeated measurement of real-time affective states in the natural environment that minimize recall biases and maximize ecological validity (Trull et al., 2015). However, daily diary designs rarely have been used to study individual differences in affective reactivity and instability.

Therefore, the primary objective of the current study was to examine whether trait resilience, problem-focused coping, social support seeking strategies, and parent-adolescent communication predicted between-person, individual differences in affective reactivity and instability with regard to both negative and positive affect utilizing a daily diary design in a national community sample of U.S. adolescents. Notably, the experience of daily conflict, specifically the perception of having arguments, with friends and family members was used as the stressor to assess affective reactivity in this study. Conflicts were selected as the stressor of interest because they increase in frequency and salience during adolescence (Laursen & Collins, 1994), and have been demonstrated in daily diary studies to be linked consistently to decreases in negative affect and increases in positive affect among adolescents (Chung et al., 2011; Vannucci et al., 2018). This approach increased confidence that the expected overall effects would be observed. Moreover, the increase in conflicts during adolescence has been identified by developmental models of emotion dysregulation as a salient contextual factor that contributes to exacerbated affective reactivity and instability (Casey et al., 2008).

Developmental models of emotion dysregulation (Renaud & Zacchia, 2013; Spear, 2009) and the general tenets of positive youth developmental theories (Lerner et al., 2015) were considered jointly to guide overarching study hypotheses that adolescents with higher levels of protective individual- and interpersonal-level factors would have more adaptive levels of emotion dysregulation indices. Based on the extant models of resilience (Fergus & Zimmerman, 2005), coping (Zimmer-Gembeck & Skinner, 2016), and social support (Cohen & Wills, 1985) and the related research described above, it was hypothesized that higher levels of trait resilience; more frequent use of planning, active coping, instrumental support seeking, and emotional support seeking; and better mother- and father-adolescent communication would predict lower negative affect reactivity, greater positive affect reactivity, and less negative and positive affect instability. It was also expected that problem-focused coping strategies would exhibit a more robust relationship with positive affect reactivity relative to other protective factors in light of the transactional model of stress and coping, which suggests that these strategies promote self-efficacy, competency, and mastery (Folkman & Moskowitz, 2000). Furthermore, it was hypothesized that the effect of mother-adolescent communication would exhibit stronger effects than father-adolescent communication given research demonstrating that adolescents' communication with their mother typically is more positive than their communication with their father (Smetana et al., 2006).

Methods

Recruitment

Families with at least one adolescent child were recruited for the daily diary study via a web-based research company, Lightspeed Global Marketing Insight. The study was advertised via multiple online outlets across the U.S., including e-mails, social media, affiliates, and banner advertisements. Registered adult panelists were e-mailed an invitation to participate in the study if they met the following inclusion criteria: being married, having a full-time job, and having a child between 13-17 years. These criteria were necessary for the broader study design, which sought to examine how parents' daily work stress impacted adolescents' daily psychosocial functioning.

Participants

Participants were a national U.S. sample of 100 adolescents ($M_{\text{age}} = 15.1$, $SD = 1.0$; Range = 13-17 years; 40% girls) who were involved in a daily diary study aimed at examining parent-adolescent interactions (Authors, Year; study website). All participants provided at least two consecutive daily diary reports. Most adolescents identified as being non-Hispanic White (79%), with the remaining identifying as Black or African American (6%), Hispanic or Latino (8%), or Asian (7%). Most adolescents reported good psychosocial functioning, with only ~2-3% scoring above clinical cutoffs for the Anxious-Depressed, Rule-Breaking Behavior, and Social Problems subscales of the Youth Self-Report (Achenbach & Rescorla, 2001). Most adolescents lived with two biological parents (86%), with the rest residing either with one biological parent and one stepparent (10%) or with two legal guardians (4%). Parent-reported annual household total income for the sample was as follows: 3% between \$10,000-\$29,999; 7% between \$30,000-\$49,999; 18% between \$50,000-\$69,999; 31% between \$70,000-\$99,999; 27% between \$100,000-\$149,999; 11% between \$150,000-\$200,000; and 3% more than \$200,000.

Procedures

Parents provided informed consent and adolescents provided assent prior to study participation. Adolescents completed an online baseline survey assessing demographic characteristics and psychosocial functioning, which took ~15 minutes. Adolescents were then instructed to complete an online daily survey on 14 consecutive evenings within the next 21 days. Each daily survey took approximately five minutes to complete. Adolescents received a daily reminder email prompting them to complete their daily survey between 7:00pm and 12:00am. Participants were compensated with \$3 for completing the baseline survey, \$3 for each daily survey completed (up to 14 days), and a \$25 bonus for completing all 14 daily surveys. The [Author Institution] Institutional Review Board approved all study procedures.

Baseline Measures

Demographics.—Adolescents reported on their age, gender, and race/ethnicity. Parents reported on their highest level of education completed and annual household income.

Adaptive coping.—The Coping Orientation to Problems Experienced (COPE) Inventory (Carver, Scheier, & Weintraub, 1989) assessed the dispositional use of rationally- and empirically-derived adaptive coping strategies. The following COPE subscales were administered and each consisted of four items: active coping (sample item: “I take direct action to get around the problem”), planning (sample item: “I try to come up with a strategy about what to do”), emotional social support seeking (sample item: “I talk to someone about how I feel”), and instrumental social support seeking (sample item: “I try to get advice from someone about what to do”). Adolescents were asked to rate what they usually did and how they usually felt in response to stressful situations, with responses ranging from 1 = *I usually don’t do this at all* to 4 = *I usually do this a lot*. We summed item scores for each COPE subscale to generate subscale scores (range = 4-16). Higher scores indicated greater frequency of using each coping strategy. The COPE has demonstrated good internal consistency and construct validity with other coping measures, as well as convergent and discriminant validity in adolescents (Kato, 2015). The COPE subscales had acceptable internal consistency in the current study (α s = .77-.85).

Parent-adolescent communication.—The Parent-Adolescent Communication Scale (PACS; Barnes & Olson, 2003) assessed adolescents’ communication quality with their parents. Adolescents completed the PACS in relation to their mothers (M-PACS) and fathers (F-PACS) separately. The PACS asked adolescents to rate how strongly they agree with 20 statements regarding their communication with a parent. Ten items reflected open communication (sample item: “I can discuss my beliefs with my mother/father without feeling restrained or embarrassed.”), and ten items reflected communication problems (sample item: “My mother/father insults me when s/he is angry with me.”). The 20-item PACS measure utilized item responses ranging from 1 = *strongly disagree* to 5 = *strongly agree*. A parent-specific PACS total score was generated by summing the 10 open communication items and the 10 reverse-coded communication problem items (range = 20-100). Higher PACS total scores indicated better communication quality. The PACS has shown good reliability and construct validity with other family functioning measures in adolescents (Barnes & Olson, 2003). In this study, excellent internal consistency was observed for the M-PACS and F-PACS (α s = .90-.91).

Trait resilience.—The brief version of the Connors-Davidson Resilience Scale (CD-RISC; Campbell-Sills & Stein, 2007) assessed adolescents’ trait resilience, conceptualized as their ability to cope with, adapt to, and recover from stress. The CD-RISC asked adolescents to rate how true 10 statements were for them (sample item: “I can deal with whatever comes.”). Item responses ranged from 0 = *not at all true* to 4 = *true nearly all of the time*, which were summed to generate a CD-RISC total score (range = 0-40). Higher CD-RISC total scores indicated higher trait resilience. The CD-RISC has demonstrated good reliability and construct validity with other resilience measures in adolescents (Lim, Broekman, Wong, Wong, & Ng, 2007). The CD-RISC had good internal consistency (α = .87).

Daily Diary Measures

Daily conflict.—Conflict with parents, siblings, and friends was assessed daily with four items corresponding to, “I argued with my mom/dad/sibling(s)/friend(s) today.” Adolescents

responded with either “yes” (coded as 1) or “no” (coded as 0) to each item. The items were summed to generate a daily total conflict score (range = 0-4). These items have been used reliably in prior adolescent studies assessing conflict with others and interpersonal stress, and have been associated with between- and within-person negative and positive affective states (Chung et al., 2011; Vannucci et al., 2018).

Daily affective states.—Negative and positive affective states were assessed daily with the Profile of Mood States, 2nd Edition, Youth Version (POMS-2Y; Heuchert & McNair, 2012). Daily state negative affect was assessed by averaging item responses from the following scales: Anger-Hostility (sample item: *angry*; $\alpha = .83$), Depression-Dejection (sample item: *sad*; $\alpha = .79$), and Tension-Anxiety (sample item: *nervous*; $\alpha = .82$). Daily state positive affect was assessed by averaging item responses from the following scales: Friendliness (sample item: *happy*; $\alpha = .79$) and Vigor-Activity (sample item: *full of energy*; $\alpha = .84$). Adolescents were asked to rate their current affect on 45 items each day on a response scale ranging from 0 = *not at all* to 4 = *extremely*. The POMS-2Y has been shown to be a reliable and valid instrument of affective states in adolescents (Heuchert & McNair, 2012). In the current study, the POMS-2Y had good internal consistency for both subscales (α s = .81-.82).

Analytic Plan

Data were analyzed in three stages, following procedures from prior daily diary studies examining associations between measures of psychological functioning and individual, between-person differences in daily affective reactivity and instability (Bai & Repetti, 2018; Neumann et al., 2011; Robles et al., 2016). Notably, model parameters for the first and second stages of data analysis were estimated using full information maximum likelihood (FIML) estimation, which weights participants’ data in the models proportionally according to the degree of missing data to minimize biases (Laird, 1988). All participants had complete data for the third stage of analysis.

In the first stage, using MPlus 8.0 (Muthen & Muthen, 1998-2017), two-level multilevel models were estimated with days (level-1, within-person) nested within adolescents (level-2, between-person) to examine the within-person effects of daily conflict on same-day negative and positive affect while allowing the intercept and slope to vary randomly between individuals (Bolger & Laurenceau, 2013). A first-order autoregressive (AR-1) covariance structure was used to adjust for time dependencies across days. Daily conflict (level-1 independent variable) was person-mean centered, whereas average conflict frequency (level-2 independent variable) was grand-mean centered. Time served as a level-1 predictor variable.¹ The two dependent variables, same-day negative affect and same-day positive affect, were examined in separate models. The random slope effects for the multi-level models subsequently were inspected, which represent the degree of between-person variance of the within-person association between conflict and same-day affective states. The

¹The effects of several time variables (level-1) were examined to evaluate potential main effects and interactions in the multi-level models, including the numerical day of reporting, the day of the week participants began the daily diary study, and reports made on weekends versus weekdays. No significant main effects or interactions for these time variables were found in any models ($ps > .05$).

affective reactivity variables were calculated when there was statistically significant variance in the random slopes for negative and positive affect.

In the second stage, using Stata 15 (StataCorp, 2017), adolescents' daily affective reactivity and instability were calculated, representing the dependent variables relevant to the primary study objectives. Two-level multilevel models were used to generate the best linear unbiased predictions (BLUPs) of the negative and positive affect random slopes for each adolescent, also referred to as empirical Bayesian (EB) estimates. For affective reactivity, same-day, within-person conflict was used to predict random slopes, whereas previous-day within-person conflict was used for affective instability. These estimates were saved for the third and final stage of analysis. Based on recommendations stemming from simulations by Jahng and colleagues (2008), the mean square successive difference (MSSD) index was calculated as a measure of negative and positive affect instability. Although other indices of affective instability such as standard deviation also are available, they are limited in that they only take into account the variability in consecutive measurements (Jahng et al., 2008). The MSSD, however, takes into account both variability, considered the average magnitude of affective changes in consecutive observations, *and* temporal dependency, defined as the average frequency of affective changes (Jahng et al., 2008). The MSSD was calculated separately for negative affect and positive affect by taking the average of the squared difference between successive, consecutive observations at measurement occasions $i + 1$ and i for a time series of N measurement occasions using the following equation:

$$\text{MSSD} = \frac{1}{N-1} \sum_{i=1}^{N-1} (x_{i+1} - x_i)^2.$$

The MSSD for negative and positive affect was logarithm-transformed to achieve normality.

In the third and final stage of analysis, using SPSS 24.0 (IBM Statistics, Armonk, NY), linear regression models were conducted to examine associations between the protective factors assessed at baseline and the individual difference measures of daily affective reactivity and instability. Independent variables included: active coping, planning, emotional support seeking, instrumental support seeking, mother-adolescent communication, father-adolescent communication, and trait resilience. The four dependent variables included: negative affect reactivity, positive affect reactivity, negative affect instability, and positive affect instability. Covariates included the EB estimate of the random intercept for either negative or positive affect (depending on the model) calculated in the second stage of analysis to control for average affective state levels.² All predictors were mean-centered.

²Gender, age, and race/ethnicity were included to evaluate potential main effects and interactions in both the multi-level models (stage one of analysis) and the regression models (stage three of analysis). No significant main effects or interactions were found in any models, and therefore these covariates were not included in the models presented. Notably, their inclusion did not alter the pattern, magnitude, or significance of the results.

Results

Adolescents completed about 7 daily surveys, on average, during the daily diary study ($M = 6.64$, $SD = 3.91$). The total number of daily surveys completed was not significantly associated with the day of the week adolescents started the daily diary study, gender, age, race/ethnicity, parent education attainment, annual household income, daily conflict frequency, average levels of negative and positive affect, extent of affective reactivity, or the degree of negative and positive affect instability ($ps > .05$). In addition, there was no difference in the likelihood of having missing daily surveys on weekends versus weekdays, $\chi^2(1) = 0.002$, $p > .05$.

Nearly all adolescents (90%) reported at least one conflict across the daily diary study, ranging from 0-3 conflicts reported each day. Adolescents' reported relatively frequent rates of conflict on average across all daily assessments ($M = 0.57$, $SD = 0.49$). A total of 431 conflicts were reported across all of the daily assessments, ranging from 0 to 10 total conflicts reported by each adolescent (see Table 1 for the distribution). There were no significant gender differences or weekend (vs. weekday) differences in the overall daily conflict frequency, average levels of negative or positive affect reported throughout the daily diary study, or degree of negative and positive affect instability ($ps > .05$).

Affective Reactivity

Table 2 depicts the fixed and random effects of multi-level models examining same-day associations between daily conflict and affective states.

Negative affect reactivity.—The intraclass correlation coefficient was 0.74, suggesting that it was appropriate to conduct the multi-level models. At the within-person level, more conflict reported by adolescents was associated with higher levels of negative affect on that day relative to days with lower levels of conflict ($p < .001$). The variance of the random slope for within-person daily conflict was significant ($p < .001$), suggesting that there were significant between-person, individual differences in the variability of negative affect reactivity. As such, the EB estimates for negative affect reactivity were calculated and ranged from -0.82 to 1.40 .

Positive affect reactivity.—The intraclass correlation coefficient was 0.67, again indicating that the use of multi-level models was appropriate. At the within-person level, more conflict reported by adolescents was associated with lower levels of positive affect on that day relative to days with lower levels of conflict ($p < .001$). The variance of the random slope for within-person daily conflict was significant ($p < .001$), suggesting that there were significant between-person, individual differences in the variability of positive affect reactivity. As such, the EB estimates for positive affect reactivity were calculated and ranged from -0.27 to 0.31 .

Individual-Level Protective Factors in Relation to Affective Reactivity and Instability

Table 3 depicts the unstandardized estimates from the hierarchical linear regression models examining the associations between individual-level protective factors and indices of affective reactivity and instability, adjusting for EB estimates of random intercepts.

Affective reactivity.—There was no significant association between individual-level protective factors and negative affect reactivity, $F(4, 96) = 1.52, p > .05, R^2 = .06$. However, there were significant associations between individual-level protective factors and positive affect reactivity, $F(4, 96) = 2.94, p < .05, R^2 = .11$. Specifically, greater positive affect reactivity was associated with more frequent engagement in planning ($\beta = 0.44, t = 2.36, p < .05$) and active coping ($\beta = 0.39, t = 2.12, p < .05$). Positive affect reactivity was unrelated to trait resilience ($\beta = 0.01, t = 0.06, p > .05$).

Affective instability.—There were significant associations between individual-level protective factors and negative affect instability, $F(4, 96) = 7.67, p < .001, R^2 = .24$. Higher levels of trait resilience predicted significantly less negative affect instability ($\beta = -0.27, t = -2.65, p < .01$). However, neither planning ($\beta = 0.03, t = 0.16, p > .05$) nor active coping ($\beta = -0.16, t = -0.97, p > .05$) predicted negative affect instability. There was no significant association between individual-level protective factors and positive affect instability, $F(4, 96) = 1.17, p > .05, R^2 = .05$.

Interpersonal-Level Protective Factors in Relation to Affective Reactivity and Instability

Table 4 depicts the unstandardized estimates from the hierarchical linear regression models examining the associations between interpersonal-level protective factors (emotional support seeking, instrumental support seeking, mother-adolescent communication, father-adolescent communication) and indices of affective reactivity and instability, adjusting for EB estimates of random intercepts.

Affective reactivity.—There were significant associations between interpersonal-level protective factors and negative affect reactivity, $F(4, 96) = 2.64, p < .05, R^2 = .10$. Specifically, better mother-adolescent communication predicted significantly less negative affect reactivity ($\beta = -0.29, t = -2.32, p < .05$). However, negative affect reactivity was unrelated to emotional support seeking ($\beta = -0.18, t = -1.23, p > .05$), instrumental support seeking ($\beta = 0.05, t = 0.31, p > .05$), and father-adolescent communication ($\beta = -0.09, t = -0.75, p > .05$). There were no significant associations between interpersonal-level protective factors and positive affect reactivity, $F(4, 96) = 1.62, p > .05, R^2 = .06$.

Affective instability.—There were significant associations between interpersonal-level protective factors and negative affect instability, $F(4, 96) = 10.04, p < .001, R^2 = .30$. More frequent engagement in emotional support seeking predicted significantly greater negative affect instability ($\beta = 0.29, t = 2.01, p < .05$). Conversely, more frequent engagement in instrumental support seeking ($\beta = -0.45, t = -2.81, p < .01$) and better mother-adolescent communication ($\beta = -0.31, t = -2.23, p < .05$) predicted significantly less negative affect instability. However, father-adolescent communication was unrelated to negative affect

instability ($\beta = -0.08$, $t = -0.55$, $p > .05$). There were no significant associations between interpersonal-level factors and positive affect instability, $F(4, 96) = 1.95$, $p > .05$, $R^2 = .08$.

Discussion

The daily emotional experiences of adolescents are dynamic and crucial to their psychological adjustment (Heller & Casey, 2016). The purpose of the current study, therefore, was to examine protective factors linked to between-person, individual differences in daily affective reactivity to conflict and affective instability utilizing a diary design in a national community sample of U.S. adolescents. Consistent with prior theory and research indicating that conflict is a potent daily stressor for adolescents (Laursen & Collins, 1994; Vannucci et al., 2018), adolescents, on average, reported modest increases in negative affect and decreases in positive affect on days with more conflict. The average magnitude of both affective reactivity and instability were comparable to other community samples of adolescents (Bai & Repetti, 2018; Neumann et al., 2011), suggesting that most adolescents exhibited “normative” levels with regard to both positive and negative affect. Despite these tendencies, marked individual differences in adolescents’ affective reactivity to conflict and affective instability from day-to-day nonetheless were observed with respect to both negative and positive affective states. Notably, adolescents in the upper end of the sample distributions had levels of negative affect reactivity and instability in magnitudes similar to clinical samples (Herres, Caporino, Cummings, & Kendall, 2018; Trull et al., 2008). The presence of such individual differences confirms the need to increase knowledge on factors hypothesized to contribute to the development of daily affective reactivity and instability during adolescence.

Individual-Level Protective Factors

Trait resilience.—Higher levels of trait resilience reported at baseline predicted lower levels of negative affect instability, or greater stability in negative affect, across days among adolescents in the current study. These findings support developmental models of emotion dysregulation (Heller & Casey, 2016; Renaud & Zacchia, 2013), which propose that aspects of temperament contribute to the emergence of individual differences in emotion dysregulation, and models of resilience (Fergus & Zimmerman, 2005), which suggest that trait resilience enhances other protective factors (e.g., attenuated negative affect instability) to elicit adaptive outcomes. The findings extend these models by specifically suggesting that trait resilience may uniquely enhance or be related to adolescents’ ability to maintain relatively stable negative affective states regardless of their average levels of negative affect, exposure to stressors, and shifting contextual experiences. Shared genetic underpinnings may in part account for the relationship between trait resilience and negative affect instability, as individual differences in both constructs are largely determined by additive genetic factors (Feder, Nestler, & Chamey, 2009; Hawn, Overstreet, Stewart, & Amstadter, 2015). It is possible that such common genetic factors are expressed through variations in autonomic and corticolimbic functioning, which mediate individual differences in negative affective processes and stress responses (Feder et al., 2009; Renaud & Zacchia, 2013). Other mechanisms that may account for why trait resilience contributes to attenuated negative affect instability among adolescents include flexible affective processing of emotionally

salient stimuli (Genet & Siemer, 2011) and attentional shifting away from negative emotional stimuli coupled with biases toward positive stimuli (Parsons, Kruijt, & Fox, 2016).

Problem-focused coping.—More frequent use of problem-focused coping strategies, including planning and active problem solving, predicted significantly greater positive affect reactivity to daily conflict among adolescents in this study. These findings support transactional models of stress and coping (Folkman & Moskowitz, 2000), which propose that experiences of self-efficacy, competence, mastery, and control that occur upon using problem-focused strategies to cope with stressors elicit positive affective responses. The finding that the use of problem-focused coping strategies was unrelated to daily negative affect reactivity contrast initial theoretically-driven hypotheses consistent with coping theories of psychopathology (Zimmer-Gembeck & Skinner, 2016) and the only prior daily diary study of adolescents (Galla & Wood, 2015). It is possible that the assessment of conflict alone, rather than other types of stressors, may contribute to these discrepant findings with regard to negative affect. However, the pattern of affective reactivity findings in the current study are consistent with the alternative hypothesis that adaptive coping strategies may be more facilitative of greater increases in positive affect rather than reductions in negative affect (Aldao, Nolen-Hoeksema, & Schweizer, 2010). Individual differences in adolescents' stressor appraisal tendencies also may account for why problem-focusing coping would be linked to their individual differences in positive affect reactivity, but not negative affect reactivity. According to transactional stress models (Folkman & Moskowitz, 2000), adolescents who tend to use problem-focused coping strategies are likely to appraise stressors as challenges and opportunities for growth, which elicits positive affect, rather than threats that are anticipated to cause harm or loss. It is plausible that adaptive levels of positive affect reactivity may serve as one of the mechanisms through which problem-focused coping decreases the risk for psychopathology when exposed to daily stressors, as increased levels of positive affect protect youth from developing internalizing and externalizing problems (Gilbert, 2012).

Interpersonal-Level Protective Factors

Support seeking.—Findings from the current study indicated that the use of both social support seeking strategies significantly was associated with individual differences in daily negative affect instability, but in opposing directions. More frequent engagement in instrumental support seeking predicted lower levels of negative affect instability, which is aligned with social support and coping theories suggesting the presence of a stress buffering influence from seeking support that should result in greater stability in negative affect despite the presence of contextual stressors (Cohen & Wills, 1985; Zimmer-Gembeck & Skinner, 2016). Notably, instrumental support seeking involves aspects of both social support and problem-focused coping (Zimmer-Gembeck & Skinner, 2016), which represent important adaptive aspects of intentional self-regulation and social connection put forth by positive youth development theories (Lerner et al., 2015). When considering both coping and positive youth development theories (Folkman & Moskowitz, 2000; Lerner et al., 2015), this strategy may promote negative affect stability via the stress buffering effects of social support, improvements in competence and physiological readiness for coping with daily

demands, and increases in psychosocial well-being. In contrast to proposals made by these theories and developmental models of emotion dysregulation (Beauchaine, 2015; Renaud & Zacchia, 2013), however, more frequent use of emotional support seeking predicted higher levels of negative affect instability. It is possible that a third variable, such as attachment security, accounts for this unexpected relationship. According to attachment theory (Schore & Schore, 2008), individuals with an insecure-anxious attachment style often exhibit emotional overdependence on others, which may include emotional support seeking behaviors, as well as higher levels of negative affect instability. Similarly, emotional support seeking also may be a form of excessive reassurance seeking among adolescents who are distressed or have insecure-anxious attachment styles (Vélez et al., 2016), which often generates additional stressors and therefore may contribute to increased negative affect instability. Alternatively, it is possible that adolescents who tend to focus on emotions while seeking support for stressors engage in other maladaptive emotion-focused coping strategies (e.g., co-rumination) that heighten negative affective responses and contribute to larger day-to-day fluctuations in negative affect (Vélez et al., 2016).

Parent-adolescent communication.—Better mother-adolescent communication, but not father-adolescent communication, predicted attenuated daily negative affect reactivity to conflict and greater negative affect stability among adolescents in this study. These findings support developmental models of emotion dysregulation that emphasize the central role of parent-adolescent relationship quality for understanding the development of affective reactivity and instability (Renaud & Zacchia, 2013; Spear, 2009). These results also are consistent with family systems and social support theories and prior daily diary studies indicating that parental warmth and positive parenting behaviors exert a stress buffering effect in adolescents (Laursen & Collins, 2004; Lippold et al., 2016). Such stress buffering effects may in part occur as a result of positive parenting cues that dampen the activation of neuroendocrine stress response systems and corticolimbic circuitry (Gunnar, Hostinar, Sanchez, Tottenham, & Sullivan, 2015). Findings further suggest that mother-adolescent communication is related to enhanced negative affect stability, which may occur as a result of maternal modeling of warm, affective behaviors during interactions with their children that allow adolescents to understand, experience, and express negative affective states in adaptive ways (Griffith et al., 2018; Laursen & Collins, 2004). In line with attachment theory (Schore & Schore, 2008), adolescents also may learn to regulate negative affect effectively during interactions in which mothers provide guided, supportive instruction for their children and bolster their children's confidence to engage in adaptive self-regulation processes (Brand & Klimes-Dougan, 2010). Relatedly, the unobserved associations between father-adolescent communication and adolescents' affective reactivity and instability may be explained by the fact that adolescent interactions with fathers are less likely to provide opportunities to discuss emotions and that mothers are still the primary caregivers in most U.S. families (McGraw & Walker, 2004).

Positive Affect Instability

Surprisingly, no protective factors in this study were associated with positive affect instability, which contrasts proposals made by developmental models of emotion dysregulation and positive youth development theories (Beauchaine, 2015; Lerner et al.,

2015). The nature of the relatively healthy community sample may have limited the magnitude of daily positive affect changes. Indeed, positive affect remained fairly high and stable, on average, throughout the study and the range of positive affect instability scores was much smaller than the range of negative affective instability scores. This trend has been observed in another daily diary study of adolescents recruited from schools, which did not find significant between-person, individual differences in emotion dysregulation indices of positive affect (Bai & Repetti, 2018). It is also possible that other individual- or interpersonal-level protective factors not assessed in the current study contribute to individual differences in positive affect instability, such as the use of cognitive reappraisal as an adaptive coping strategy (Gunaydin, Selcuk, & Ong, 2016), engagement in moderate-to-vigorous physical activity (Dunton et al., 2014), and positive parental affective behaviors expressed during conflicts (e.g., validation; Whalen et al., 2014). Given that exaggerated positive affect instability is linked to risk for many forms of psychopathology (Carl et al., 2013; Gilbert, 2012), it is important for future research to recruit samples that are likely to have a wide range of individual differences in positive affect instability and examine related protective factors.

Strengths and Limitations

The current study provided novel information about individual- and interpersonal-level factors related to individual differences in two key indices of emotional dynamics and emotion dysregulation, including daily affective reactivity and instability, during adolescence. The use of a daily diary design to capture affective reactivity to conflict and affective instability across days represents a significant strength and novelty, as this approach minimizes recall biases and increases the ecological validity of the study (Trull et al., 2015). Moreover, the focus on between-person differences in the magnitude of these daily emotional processes, rather than overall within-person associations, addressed a significant gap in the extant literature because individual differences in affective reactivity and instability are crucial components of emotion dysregulation and psychological adjustment. Other study strengths include the recruitment of a national U.S. community sample of adolescent girls and boys; the focus on a range of protective factors hypothesized to contribute to individual differences in affective reactivity and instability; and the assessment of both negative and positive affect. These methodological strengths extend prior research in this area that has had a tendency to focus on clinical samples, risk factors and deficit-based approaches, and solely negative affective states.

Conclusions regarding the current findings also must be considered in light of the study limitations. The sample was fairly homogeneous with regard to race/ethnicity, socioeconomic status, and household composition (i.e., two employed parents of opposite-sex), and therefore caution is warranted in generalizing the study findings. Daily affective reactivity was assessed only in relation to perceived conflict with parents, siblings, and friends, as conflict is a frequent and potent stressor during adolescence (Laursen & Collins, 1994) and developmental models of emotion dysregulation identify increases in conflict as a key contextual factor linked to exacerbations in affective reactivity and instability during adolescence (Casey et al., 2008). However, there are other dimensions of conflict (e.g., intensity), a variety of daily stressors types, and positive daily events that also may

contribute to individual differences in affective reactivity and instability (Bai & Repetti, 2018; Herres et al., 2018), which require investigation in future studies. “Long-term,” between-day affective instability is an important emotion regulation construct and has been assessed frequently in prior daily diary studies (Neumann et al., 2011; Renaud & Zacchia, 2013), but short-term, within-day affective instability also is a central index of emotion regulation and could not be assessed with the current study design. Although the dispositional coping measure used in the current study is valid and widely used (Kato, 2015), such measures may have limited concordance with daily reports of coping that are tied to specific stressors (Todd, Tennen, Comey, Armeli, & Affleck, 2004). In addition, some aspects of social support seeking strategies were not assessed that may impact their relationship to affective reactivity and instability, such as the source of support or the degree of support perceived (Zimmer-Gembeck & Skinner, 2016). Finally, this study had limited power to evaluate moderators such as gender, precluding a primary focus on these issues, and therefore research examining the relationship between protective factors and affective reactivity and instability with larger samples is needed.

Implications and Future Directions

The current study yields several significant theoretical considerations. This study indicates that between-person, individual differences in temporal emotional dynamics that unfold within a person, including affective reactivity and instability, may be assessed effectively using intensive longitudinal designs. Moreover, findings suggest that it would be useful for developmental models of emotion dysregulation and emotion dysregulation models of psychopathology to take both negative and positive valence dimensions of emotion dysregulation into account systematically to align with common conceptualizations of affect (Posner et al., 2005) and to more fully understand adolescents’ emotional development. In addition, the findings from this study lend support to developmental models of emotion dysregulation, which propose that aspects of temperament, coping, and parent-adolescent relationships contribute to individual differences in key indices of emotion dysregulation, affective reactivity and instability, during adolescence (Renaud & Zacchia, 2013; Spear, 2009). Furthermore, these findings suggest that developmental models of emotion dysregulation should expand their deficit-oriented approaches to incorporate principles and constructs espoused by positive youth development theories (Lerner et al., 2015), as several individual- and interpersonal-level protective factors were linked to individual differences in affective reactivity and instability. The findings also extend developmental models of emotion dysregulation and positive youth development theories by suggesting that there may be a high degree of specificity regarding the pattern in which trait resilience, problem-focused coping, social support seeking, and parent-adolescent communication were linked to facets of emotion dysregulation.

Given that adolescents with heightened affective reactivity and/or instability are at higher risk for psychopathology and compromised positive development regardless of the emotional valence (Beauchaine, 2015; Lerner et al., 2015), it is important consider the clinical implications stemming from the current study. Although individual differences in trait resilience appear to be determined largely by genetic factors (Feder et al., 2009), there are nonetheless modifiable aspects of adolescents’ individual skills and environments that

may bolster trait resilience and ultimately promote attenuated negative affect instability. Resilience-focused intervention approaches suggest that it is important and effective to identify individual assets (e.g., self-efficacy for health-promoting behaviors, social skills with peers, participation in extracurricular activities) and positive environmental resources, (e.g., adult mentorship, parenting skills, health-promoting community settings) as the goals for change (Fergus & Zimmerman, 2005). The use of problem-solving therapy would likely be effective in minimizing extreme decreases in positive affect following stressors and even in promoting increases in positive affect in response to daily hassles (Bell & D'Zurilla, 2009). Research has shown that it is crucial to focus on two major goals within problem-solving therapy (Bell & D'Zurilla, 2009). First, adolescents are encouraged to adopt a positive problem solving orientation, whereby problems are appraised as opportunities for growth and self-efficacy in problem solving abilities is bolstered. Second, it is critical for adolescents to acquire a rational problem-solving style that involves defining the problem, generating alternative solutions, making decisions, implementing the solution, and evaluating the consequences. Problem-solving therapy also would likely increase instrumental support seeking, which has the potential to reduce negative affect instability. To reduce exaggerated negative affect reactivity and instability, it would likely be beneficial to focus on increasing the use of support seeking strategies and improving open, supportive communication patterns between adolescents and their parents, especially with mothers. There are a number of different interventions that have been shown to improve adolescent-parent communication and reduce family conflict, including interpersonal psychotherapy (Young, Kranzler, Gallop, & Mufson, 2012), social problem solving therapy (Semeniuk, Brown, & Riesch, 2016), and multi-family group therapy (Dickerson & Crase, 2005). These therapies differ somewhat in their modalities, but all focus on teaching adolescents' basic social skills such as identifying and expressing emotions, understanding nonverbal communication, listening to others, increasing empathy, and communicating opinions, emotions, and needs. Overall, a personalized approach targeting specific protective factors linked to certain emotion dysregulation indices may be efficacious and cost-effective.

Future studies should continue to assess individual differences in emotion dysregulation indices using intensive longitudinal designs, including affective reactivity and instability and expanding to other indices such as affective inertia or persistence. Examining a broader range of protective factors within the hypothesized developmental mechanisms of temperament, coping, and parent-child relationships also has the potential to provide additional specificity to proposed pathways leading to the emergence of individual differences in emotion dysregulation. There also may be salient protective psychosocial factors outside of these three developmental pathways that may influence individual differences in affective reactivity and stability that are worthy of future investigation, such as peer relationships, health-promoting behaviors, and technology use. To delineate mechanisms that account for the relationships between individual- and interpersonal-level protective factors and emotion dysregulation indices observed in the current study, future research also should involve mixed method designs that allow laboratory paradigms to predict daily emotional experiences in the natural environment and the simultaneous assessment of self-reports and physiological correlates multiple times per day using ecological momentary assessment. Furthermore, including intensive longitudinal methods

within prospective studies has the potential to identify protective factors that contribute to the development of adaptive levels of affective reactivity and instability in the long-term, as well as identify adolescents who may experience the greatest benefit from emotion dysregulation-focused prevention programs.

Conclusion

Emotional dynamics play a vital role to daily functioning, and emotion dysregulation confers risk for numerous forms of psychopathology during adolescence. As such, the current study sought to examine psychosocial protective factors that predict individual differences in emotion dysregulation indices. The current study represents an important step toward assessing individual differences in emotion dysregulation indices that unfold over a short period of time within an individual, including affective reactivity and instability, by employing a daily diary design in a community sample of U.S. adolescents. Conceptually, this study is innovative in applying the principles of positive youth development theories (Lerner et al., 2015) to developmental models of emotion dysregulation (Beauchaine, 2015) so that novel protective factors that promote adaptive levels of affective reactivity and instability could be identified. The findings suggest that: 1) higher trait resilience and more frequent instrumental support seeking predicted attenuated negative affect instability; 2) more frequent engagement of problem-focused coping strategies were linked to increased positive affect reactivity to daily conflict; and 3) open, supportive communication between adolescents and their mothers was associated with both lower levels of negative affect reactivity to daily conflict and decreased negative affect instability. As such, interventions that bolster adolescents' resilience, problem-focused coping, social support seeking, and mother-adolescent communication may be effective for optimizing the emotional development of adolescents. Given the specificity of the relationships between the protective factors and distinct indices of emotion dysregulation in this study, parsing emotional dynamics into their basic components for both negative and positive valence dimensions and relating them to longer-term psychosocial experiences may improve awareness of why some adolescents have normative, healthy emotion regulation while others are at risk for severe emotion dysregulation. Such understanding of real world emotional dynamics will inform strategies for identifying adolescents who are at risk for psychopathology, treating emotion dysregulation and psychopathology, and enhancing the overall wellbeing of adolescents.

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Table 1

Number of Conflicts Reported Across All Daily Diary Assessments Among Adolescents

Number of Conflicts	Frequency (<i>n</i>)	Cumulative Percent (%)
0	10	10
1	4	14
2	6	20
3	20	40
4	18	58
5	12	70
6	10	80
7	6	86
8	7	93
9	5	98
10	2	100

Notes: *N* = 100 adolescents with 431 total conflicts reported across the daily diary assessments.

Table 2

Parameter Estimates for the Multilevel Model Examining Same-Day Associations Between Daily Conflict and Daily Affective States

	<u>Negative Affect</u>	<u>Positive Affect</u>
Fixed Effects (intercept, slopes)	Estimate (SE)	Estimate (SE)
Intercept	0.36 (0.04) ***	2.06 (0.07) ***
Time	-0.01 (0.002) ***	-0.008 (0.004)
Within-Person Conflict	0.15 (0.04) ***	-0.23 (0.05) ***
Between-Person Conflict	0.49 (0.10) ***	-0.64 (0.19) **
Random Effects ([co-]variances)	Estimate (SE)	Estimate (SE)
Level 2 (between-person)		
Intercept	0.14 (0.02) ***	0.21 (0.01) ***
Within-Person Conflict	0.06 (0.02) ***	0.05 (0.03) *
Intercept and Within-Person Conflict	-0.01 (0.01)	0.01 (0.04)
Level 1 (within-person)		
Residual	0.14 (0.02) ***	0.44 (0.07) ***

*
 $p < .05$

**
 $p < .01$

 $p < .001$.

Table 3

Results from Hierarchical Linear Regression Models Examining the Relationship Between Individual-Level Protective Factors and Indices of Affective Reactivity and Instability

Predictor Variable	<u>Negative Affect Reactivity</u>	<u>Positive Affect Reactivity</u>	<u>Negative Affect Instability</u>	<u>Positive Affect Instability</u>
	<i>B</i> (SE)	<i>B</i> (SE)	<i>B</i> (SE)	<i>B</i> (SE)
Daily Affective State Intercept ^a	−0.13 (0.08)	0.06 (0.03)	0.36 *** (0.09)	−0.06 (0.08)
Planning	0.02 (0.09)	0.17 * (0.07)	0.01 (0.08)	−0.10 (0.12)
Active Coping	−0.11 (0.10)	0.15 * (0.07)	−0.08 (0.09)	0.01 (0.12)
Trait Resilience	0.01 (0.05)	0.002 (0.04)	−0.26 ** (0.04)	0.01 (0.06)

^aRepresents the Empirical Bayesian (EB) Estimates of the Random Intercepts from Multi-Level Models Examining Positive and Negative Affect Reactivity. The EB estimate for the positive affect random intercept was included in models examining positive affect reactivity and instability, and the EB estimate for the negative affect random intercept was included in models examining negative affect reactivity and instability.

*
 $p < .05$

**
 $p < .01$

 $p < .001$.

Table 4

Results from Hierarchical Linear Regression Models Examining the Relationship Between Interpersonal-Level Protective Factors and Indices of Affective Reactivity and Instability

Predictor Variable	<u>Negative Affect Reactivity</u>	<u>Positive Affect Reactivity</u>	<u>Negative Affect Instability</u>	<u>Positive Affect Instability</u>
	<i>B</i> (SE)	<i>B</i> (SE)	<i>B</i> (SE)	<i>B</i> (SE)
Daily Affective State Intercept ^a	−0.08 (0.09)	0.04 (0.02)	0.38 ^{**} (0.11)	−0.07 (0.08)
Emotional Support Seeking	−0.10 (0.08)	−0.03 (0.02)	0.15 [*] (0.07)	−0.04 (0.11)
Instrumental Support Seeking	0.05 (0.09)	0.02 (0.03)	−0.24 ^{**} (0.08)	−0.09 (0.12)
Mother-Adolescent Communication	−0.10 [*] (0.03)	0.01 (0.01)	−0.07 [*] (0.03)	0.05 (0.04)
Father-Adolescent Communication	−0.03 (0.03)	0.01 (0.01)	−0.02 (0.03)	−0.03 (0.04)

^aRepresents the Empirical Bayesian (EB) Estimates of the Random Intercepts from Multi-Level Models Examining Negative and Positive Affect Reactivity. The EB estimate for the positive affect random intercept was included in models examining positive affect reactivity and instability, and the EB estimate for the negative affect random intercept was included in models examining negative affect reactivity and instability.

^{*}
 $p < .05$

^{**}
 $p < .01$

^{***}
 $p < .001$.