

# Resilience to Stress and Adversity: A Narrative Review of the Role of Positive Affect

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**Abstract:** The modern conception of mental health encompasses not only mental illness but also mental wellbeing, including positive emotional states and other forms of positive experience. Accordingly, research on resilience — that is, recovery or adaptation following adversity — has recently expanded to consider the roles of positive affect in the resilience process. To review this research, we performed a keyword search of all peer-reviewed journals within the American Psychological Association’s PsycInfo database, retrieving all studies of positive affect in the context of resilience. These studies measured positive affect either as the outcome of the resilience process or as a resilience resource in its own right. With positive affect as the outcome, the literature suggests that various resilience resources can promote positive affect following a stressor, especially positive personality traits (eg, hope, optimism, self-compassion) and supportive interpersonal connections. With positive affect as a resilience resource, the literature suggests that higher levels of positive affect may protect individuals from the impact of stress on a number of outcomes, such as depression and trauma symptoms. In all, the reviewed research showcases a wide range of stressors, resources, and outcomes, and there are numerous openings for future discoveries in this promising area of inquiry.

**Keywords:** positive emotion, wellbeing, happiness, stress, trauma, adversity

## Introduction

### Historical Context

Until recent decades, mental health was measured and studied primarily in terms of mental illness, negative emotional states, and other forms of psychological distress or dysfunction, along with the risk factors that predict or exacerbate such conditions. But more recently, mental health has been increasingly recognised as comprising two related but distinct domains, namely mental illness and mental wellbeing.<sup>1-4</sup> Thus, the modern conception of mental health acknowledges not only negative symptoms but also positive outcomes, and with this broadened view have come a range of studies on protective factors that predict or accentuate favourable mental health trajectories. Consequently, there is now a large literature on *resilience*, and the various attributes that support positive mental functioning in the aftermath of stress, trauma, and other forms of adversity. Initially, even studies of protective factors examined them mostly in relation to negative outcomes (eg, studies of personality traits that may predict lower levels of depression), but more recent research has considered predictors of positive attributes too, especially *positive affect* and related variables (eg, happiness, subjective wellbeing). The overlapping fields of resilience and positive affect have produced numerous studies that shed light on how resilience can be both enabled by positive affect and measured in terms of it, and the present paper offers a narrative review of these connections.

### Defining Resilience

The concept of resilience has been defined and studied in various ways, and we must begin by clarifying it for the present purposes. Across all definitions of resilience, there is reference to the phenomenon of regaining (if not maintaining or

even increasing) one's mental health following a stressor (eg, a challenge, hardship, or aversive experience).<sup>5</sup> Here we are using the broad scientific definition of "stressor" (ie, any experience that involves a challenge, threat, or hardship), as well as the broadest definition of "mental health", encompassing all aspects – positive and negative – of an individual's psychological health and functioning. Therefore, studying resilience requires investigations into why some people rebound from or adapt to stressors more easily than others, or experience stressors as less challenging or distressing from the outset, and why certain individuals demonstrate improvements in their mental health even after highly stressful or traumatic experiences (eg, posttraumatic growth<sup>6</sup>). In addressing these research questions, a recent systematic review of resilience interventions notes that resilience has been operationally defined in one of three ways: as an *outcome*, as a *process*, and as a *trait*.<sup>7</sup> The *outcome* approach defines resilience as favourable mental outcomes at a specified point in time following the stressor in question (eg, lower levels of anxiety and higher levels of wellbeing three months after suffering a violent crime).<sup>7</sup> The *process* approach defines resilience in a similar way, but with multiple measurement occasions (either before and after the stressor, or at multiple timepoints following the stressor), allowing one to identify different trajectories of mental functioning following the stressor (eg, temporarily versus indefinitely reduced wellbeing after a major loss).<sup>7</sup> In contrast to the outcome and process definitions, the *trait* approach emphasises the personality traits that define one's ability to recover from or adapt to stressors.<sup>7</sup> The present review draws upon studies that employ all three definitions of resilience. However, we note that using the term "resilience" to label a trait (or an ensemble of traits) can make it difficult to differentiate the phenomenon of resilience (ie, recovery from or adaptation to stressors) from its predictors (such as the various protective traits that some researchers label as resilience). Therefore, we will use the term "resilience" to refer to the outcome or process of recovery or adaptation following a stressor, and we will use the phrase "trait resilience" where other authors have used the term to refer to personal attributes that enable the phenomenon of resilience to occur.

As stated above, all definitions of psychological resilience pertain to regaining or maintaining (or even improving) one's mental health (including both positive and negative outcomes) in the wake of a stressor. Therefore, resilience cannot be *directly* studied outside the context of stressors (ie, a challenge, threat, or hardship). There are many studies of trait resilience that examine this construct as a predictor, outcome, mediator, or moderator within models that do not contain any measure of perceived or actual stress, challenge, or adversity (eg, models that correlate trait resilience measures with other positive factors, such as wellbeing or cognitive performance). Such studies may be valuable in elucidating the complex interplay of the psychological variables in question, but they do not test whether the characteristics labelled as "resilience" do in fact mitigate the impact of stressors. Therefore, the present review considers only those studies of resilience that examine it in relation to some kind of stressor (moreover, it would be beyond the scope of the review to employ a more expansive usage of the term "resilience"). In this framework, a protective factor (or *resilience resource*) is necessarily one that *moderates* the impact of a stressor on one's mental health.

## The Present Review

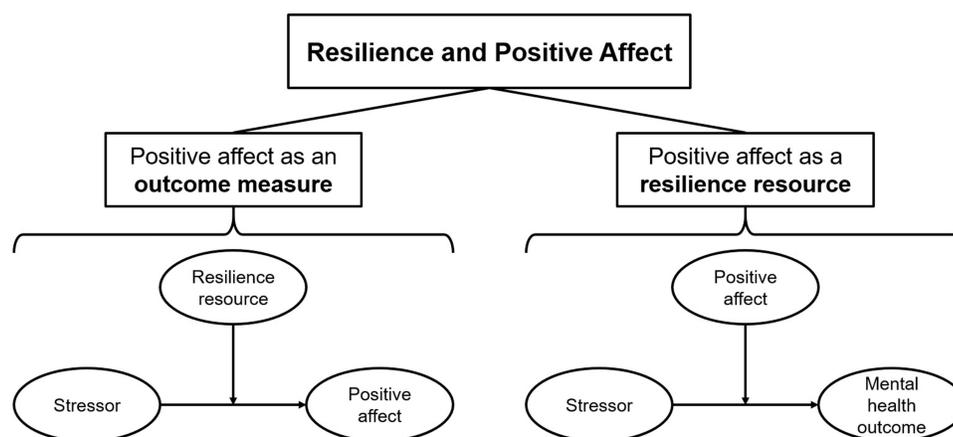
With these definitional matters resolved, we turn to the subject of our review: the relationship between resilience and positive affect. In this context, the dual role of positive affect is evident from the very definition of resilience. Given that resilience refers to mental health recovery or adaptation, and that mental health involves not only negative symptoms but also positive outcomes, then clearly positive affect can be treated as a *measure* of resilience. Therefore, all else being equal, those who experience smaller declines in positive emotion following a stressor, and those whose positive affect returns more quickly or more fully to pre-stressor levels, have exhibited greater resilience. Likewise, in the context of adaptation (rather than recovery), those who experience greater increases in positive affect following a challenge or stressor have exhibited greater resilience. Thus, the outcome or process of resilience can be measured in terms of positive affect, as well as other factors whose measures incorporate positive affect (eg, subjective wellbeing, life satisfaction). Alternatively, positive affect can be treated as a *resilience resource* – a personal or psychosocial attribute that may enable resilience. In this approach, those with greater pre-stressor positive affect are hypothesised to be more resistant to the stressor or better able to recover from (or adapt to) it; in other words, positive affect enables resilience by moderating the impact of the stressor (specifically, by mitigating this impact). The present review acknowledges both roles that positive

affect can play in the context of resilience; therefore, it includes studies that treat positive affect either as an outcome measure of resilience or as a resilience resource.

Having clarified both the concept of resilience and dual role of positive affect in relation to it, we may now begin the review proper. The purpose of our review was to summarise the findings from all studies of psychological resilience (within a relevant database) that involved positive affect in one of these two roles. Therefore, the review is divided into two main sections, with the first section covering positive affect as an outcome measure of resilience and the second section covering positive affect as a resilience resource (see Figure 1). Each section is itself divided into subsections according to the stressor or adversity involved, allowing researchers and practitioners to see which forms of hardship have already been studied and which ones may warrant greater attention. Although we did not seek to follow the format of a systematic review, we still conducted our literature search in a rigorous manner. We performed a keyword search (the broadest mode of search) of all peer-reviewed journals in the American Psychological Association's PsycInfo database, using the following search terms: (resilien\* AND (“positive affect” OR “positive emotion\*” OR “positive mood” OR “positive feeling\*” OR positivity OR wellbeing OR “well-being” OR “well being” OR wellness OR happy OR happi\* OR “life satisfaction”)). Thus, the search terms covered all words derived from resilience (eg, resilient, resiliency) and all words or phrases that either are synonymous with positive affect (or treated as such by many researchers) or denote variables (eg, wellbeing) whose definitions and/or measures often incorporate positive affect in some way. From the results of this search, we identified every empirical, quantitative study that measured resilience *directly* (ie, as the moderation of the impact of a stressor on a given mental health outcome), including studies whose tests of moderation yielded null findings. Our synthesis of these studies comprises the body of this review. From this synthesis, we have aimed to identify the resilience resources that promote the outcome of positive affect following a stressor, as well as the ways in which positive affect can serve as a resilience resource in its own right.

## Positive Affect as an Outcome Measure of Resilience

Of the studies retrieved from our search, most pertained to positive affect as an outcome (ie, as a *measure* of resilience) rather than a resilience resource. This is unsurprising, because while affective states can certainly motivate action, they are typically studied as *responses* to antecedent thoughts, beliefs, or experiences. This is especially so in the mental health context, where affective states are frequently cited in describing and diagnosing various psychological conditions. Positive affect specifically has been studied as a response to numerous kinds of stressor, which we have divided into six categories. The most traumatic stressors (usually involving abuse, violent crime, or other forms of severe mistreatment) are placed in two categories, one encompassing adverse childhood experiences and the other encompassing traumatic



**Figure 1** Graphical summary of review structure. The current review focuses on the overall topic of “resilience and positive affect” which can be considered in two ways, with “positive affect as an outcome measure” (left-hand model) or “positive affect as a resilience resource” (right-hand model). Each model is independent and depicts the phenomenon of resilience, whereby the impact of a stressor on a mental health outcome is moderated by a resilience resource. In the left-hand model, the outcome variable is positive affect. In the right-hand model, the moderator variable is positive affect. Thus, the models illustrate the two roles that positive affect may play within the resilience process.

experiences in adulthood. More common stressors (eg, daily hassles, everyday challenges, personal disputes) are placed in another two categories, one covering occupational stressors (including stressors not only in the workplace but also in academic and childrearing contexts) and the other covering experiences that are typically grouped under general labels such as “stressful life events”, “recent life events”, or “everyday stressors”. It should be noted that the events labelled in such ways are not necessarily minor; they can include events that are not usually considered to be traumatic or egregious but can still be significantly upsetting or distressing (eg, having a serious argument, losing one’s job), and some studies of stressful life events combine measures of less severe stressors with measures of potentially traumatic events (PTEs). The final two categories include adversity related to medical illnesses or other health conditions, with one category dedicated to COVID-19-related stressors (given the number of studies on this topic) and the other category covering all other medical or health conditions. Across all six categories, each study includes at least one outcome measure that either measures positive affect exclusively or incorporates positive affect along with other aspects of mental health or wellbeing. See Table 1 for a summary of these studies and the key variables in each one.

**Table 1** Summary of Reviewed Studies on Positive Affect as an Outcome of the Resilience Process

Adverse Childhood Experiences (ACEs)			
Author	Stressor	Moderator	Outcome
Armitage et al, 2022 <sup>8</sup>	Peer victimisation <i>Bullying and Friendship Interview Schedule</i>	Mental health genetics <i>Polygenic scores</i>	Mental wellbeing <i>Warwick-Edinburgh Mental Well-Being Scale (WEMWBS)</i>
Bagci et al, 2014 <sup>9</sup>	Perceived ethnic discrimination <i>Unnamed scale</i>	Cross-ethnic friendships <i>Ratio of cross-ethnic to total friendships</i>	Mental wellbeing <i>WEMWBS</i>
Cipriano et al, 2011 <sup>10</sup>	Family violence <i>Maltreatment Classification System (MCS), Conflict Tactics Scale (CTS)</i>	Vagal suppression <i>Respiratory Sinus Arrhythmia (baseline minus task)</i>	Positive affect <i>Observed Child Temperament Scale (OCTS)</i>
Cohen et al, 2021 <sup>11</sup>	Emotional maltreatment <i>Childhood Experience of Care and Abuse Questionnaire (CECA-Q)</i> Community violence <i>Screen for Adolescent Violence Exposure (KID-SAVE)</i>	Trait emotional intelligence <i>Trait Emotional Intelligence Questionnaire – Short Form (TEQ-SF)</i>	Psychological wellbeing <i>Psychological Well-Being Posttraumatic Change Questionnaire (PWB-PTCQ)*</i>
DiClemente et al, 2018 <sup>12</sup>	Past-year violence exposure <i>Exposure to Violence – Revised scale (EV-R)</i>	Family cohesion <i>Family Environment Scale (FES)</i>	Positive affect <i>Custom scale</i>
Kang et al, 2023 <sup>13</sup>	ACEs <i>Custom checklist</i>	Trait resilience <i>Resilience Research Centre Adult Resilience Measure (RRC-ARM)</i>	Quality of life <i>World Health Organization Quality of Life brief form (WHOQOL-BREF)</i>
Nishimi et al, 2022 <sup>14</sup>	Childhood adversity <i>Custom checklist</i>	Healthy lifestyle factors <i>Custom measures, Body Mass Index (BMI)</i>	Positive affect <i>Mental Health Inventory (MHI)</i>
Nurius et al, 2015 <sup>15</sup>	ACEs <i>Custom checklist</i>	Sense of community <i>Custom scale</i>	Perceived wellbeing <i>Custom scale</i>
Piña-Watson et al, 2015 <sup>16</sup>	Bicultural stress <i>Bicultural Stressors Scale (BSS)</i>	Caregiver connectedness <i>Custom scale</i>	Life satisfaction <i>Brief Multidimensional Students’ Life Satisfaction Scale (BMSLSS)</i>

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Table I (Continued).

Riley et al, 2020 <sup>17</sup>	Juvenile victimisation <i>Juvenile Victimization Questionnaire – 2nd Revision (JVQ-R2)</i>	Problem-solving coping <i>Self-report Coping Scale*</i>	Life satisfaction <i>Students Life Satisfaction Scale (SLSS)*</i> Positive affect <i>Positive and Negative Affect Schedule – Child (PANAS-C)**</i>
Seon & Smith-Adcock, 2023 <sup>18</sup>	Bullying victimisation <i>Custom scale</i>	Meaning in life <i>Custom scale</i>	Life satisfaction <i>Single-item</i>
Sleijpen et al, 2019 <sup>19</sup>	Potentially traumatic events <i>Custom checklist</i>	Trait resilience <i>Resilience Scale (RS)</i>	Life satisfaction <i>Satisfaction with Life Scale (SWLS)</i>
Somers et al, 2017 <sup>20</sup>	Childhood maltreatment <i>Childhood Trauma Questionnaire (CTQ)</i>	Heart rate reactivity <i>Heart rate (baseline minus task)</i>	Positive affect <i>Positive and Negative Affect Schedule (PANAS)</i>
Sorek, 2020 <sup>21</sup>	Parental conflict <i>Children's Perception of Interparental Conflict scale (CPIC)</i>	Closeness to grandparents <i>Custom scale</i>	Life satisfaction <i>SLSS, single-item</i>
Sorek et al, 2019 <sup>22</sup>	Parental conflict <i>CPIC, custom scale</i>	Self-blame, active coping <i>CPIC</i>	Life satisfaction <i>SLSS, single-item</i>
Tung et al, 2022 <sup>23</sup>	Family/household adversity <i>Risky Family Questionnaire (RFQ)</i>	Trait resilience <i>Brief Resilience Scale (BRS)</i>	Positive affect <i>Positive and Negative Affect Schedule – Expanded (PANAS-X)</i>
Turiano et al, 2017 <sup>24</sup>	Childhood misfortune <i>Custom checklist</i>	Control beliefs <i>Custom scale</i>	Positive affect <i>Custom scale</i>
<b>Adult trauma</b>			
<b>Author</b>	<b>Stressor</b>	<b>Moderator</b>	<b>Outcome</b>
Fetter et al, 2023 <sup>25</sup>	Perceived historical loss <i>Adolescent Historical Losses Scale (AHLs)</i>	Ethnic identity <i>Multigroup Ethnic Identity Measure – Revised (MEIM-R)</i>	Mental wellbeing <i>Mental Health Continuum – Short Form (MHC-SF)</i>
Lee et al, 2021 <sup>26</sup>	Vietnam War service	Psychosocial resources <i>Multiple measures</i>	Mental wellbeing <i>MHC-SF</i>
Liu et al, 2023 <sup>27</sup>	Perceived discrimination <i>Custom scale</i>	Belief in a Just World (BJW) <i>Belief in a Just World Scale (BJWS)</i>	Life satisfaction <i>SWLS</i>
Yubero et al, 2023 <sup>28</sup>	Chronic bullying victimisation <i>Bullying Harassment and Aggression Receipt Measure (BullyHARM), custom scale</i>	Trait resilience <i>Connor Davidson Resilience Scale 10-item version (CD-RISC-10)</i>	Mental wellbeing <i>MHC-SF</i>
<b>Stressful life events</b>			
<b>Author</b>	<b>Stressor</b>	<b>Moderator</b>	<b>Outcome</b>
Alriksson-Schmidt et al, 2007 <sup>29</sup>	Life stressors <i>Adolescent Disability-Related Life Events Survey, Adolescent Life Events Survey – Revised</i>	Social/family functioning <i>Social Skills Rating System (SSRS), Offer Self-Image Questionnaire – Revised (OSIQ-R)</i>	Quality of life <i>Quality of Student Life Questionnaire (QSLQ)</i>
Arampatzi et al, 2020 <sup>30</sup>	Greek bailout referendum	Positive expectations <i>Custom scale</i>	Happiness <i>Single-item</i>

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Table 1 (Continued).

Awaworyi Churchill & Smyth, 2022 <sup>31</sup>	Crime rate <i>Crimes per capita per postcode</i> Crime victimisation <i>Single-item</i>	Internal Locus of Control <i>Mastery Scale</i>	Mental health <i>Mental Health Inventory (MHI-5)</i>
Bucknor & Derringer, 2022 <sup>32</sup>	Stressful life events <i>Multiple measures</i>	Psychosocial resources <i>Multiple measures</i>	Positive minus negative affect <i>PANAS-X</i>
Chong et al, 2023 <sup>33</sup>	Negative experiences <i>Custom measure</i>	Trait self-compassion <i>Self-Compassion Scale</i>	Positive affect <i>PANAS-X</i>
Corral-Frías et al, 2016 <sup>34</sup>	Social stress <i>Trier Social Stress Test (TSST)</i>	Trait reward sensitivity <i>Behavioral Activation Scale (BAS)</i>	Positive affect <i>PANAS</i>
Dooley et al, 2017 <sup>35</sup>	Lifetime acute stress exposure <i>Stress and Adversity Inventory (STRAIN)</i>	Lifetime acute stress exposure <i>STRAIN</i>	Positive affect <i>PANAS</i>
Ertl et al, 2019 <sup>36</sup>	Perceived stress <i>Perceived Stress Scale (PSS)</i>	Trait resilience <i>BRS</i>	Mental health <i>Short Form Health Survey (SF-36)</i>
Gerstberger et al, 2023 <sup>37</sup>	Current stress <i>Single-item</i>	Physical activity <i>Single-item</i> Chronic stress <i>Trier Inventory of Chronic Stress (TICS)**</i>	Positive affect <i>Custom scale</i>
Goodman et al, 2017 <sup>38</sup>	Negative life events <i>Custom scale</i>	Trait hope <i>Adult Hope Scale (AHS)</i>	Mental health <i>Multiple measures</i>
Greenfield & Marks, 2004 <sup>39</sup>	Major role-identity absences <i>Custom checklist</i>	Volunteering <i>Custom measure</i>	Positive minus negative affect <i>Custom scales</i>
Hatzichristou et al, 2020 <sup>40</sup>	Recession-related difficulties <i>Economic Crisis Difficulties Questionnaire (ECDQ)</i>	Positive peer relations <i>California Healthy Kids Survey (CHKS)</i>	Joy in life <i>Berne Questionnaire of Subjective Well-Being/Youth form (BQSWIY)</i>
Hodzic et al, 2016 <sup>41</sup>	Perceived stress <i>PSS</i>	Trait emotional repair <i>Trait Meta-Mood Scale (TMMS)**</i>	Life satisfaction <i>SWLS</i>
Huang et al, 2019 <sup>42</sup>	Low socioeconomic status <i>Monthly household income</i>	Trait resilience <i>Connor Davidson Resilience Scale 25-item version (CD-RISC-25)</i>	Life satisfaction <i>SWLS</i>
Jagtiani et al, 2019 <sup>43</sup>	Excessive SNS use <i>Hours per day of SNS use</i>	Evening meals with family <i>Custom measure</i>	Mental wellbeing <i>WEMWBS**</i>
Johnson et al, 2016 <sup>44</sup>	Daily stressors <i>Survey of Recent Life Experiences</i>	Cognitive reappraisal <i>Emotion Regulation Questionnaire (ERQ)</i>	Positive mood <i>Custom scale</i>
Lazić et al, 2023 <sup>45</sup>	Negative life events <i>Serbian Life Events Check-List – Student Form (SLEC-SF)</i>	Childhood adversity <i>Revised Questionnaire for Attachment Assessment (QAA–R)</i>	Life satisfaction <i>SWLS</i> Positive affect <i>PANAS</i>
Mutz et al, 2019 <sup>46</sup>	Excessive screen time <i>Hours per day of screen time</i>	Outdoor group recreation	Life satisfaction <i>Single-item</i> Positive minus negative affect <i>Custom scales</i>

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Table 1 (Continued).

Noor & Alwi, 2013 <sup>47</sup>	Negative life events <i>Life Events Checklist, The Problem Questionnaire</i>	Psychosocial resources <i>Multiple measures</i>	Life satisfaction <i>BMSLSS</i>
Philippe et al, 2018 <sup>48</sup>	Negative mood induction <i>Experimental task</i>	Cognitive reappraisal <i>Experimental intervention</i>	Positive emotionality <i>Custom scale</i>
Seery et al, 2010 <sup>49</sup>	Lifetime and recent adversity <i>Custom checklists</i>	Lifetime adversity <i>Custom checklist</i>	Life satisfaction <i>SWLS</i>
<b>Occupational stressors</b>			
<b>Author</b>	<b>Stressor</b>	<b>Moderator</b>	<b>Outcome</b>
Annor & Amponsah-Tawiah, 2020 <sup>50</sup>	Workplace bullying <i>Negative Acts Questionnaire – Revised (NAQ-R)</i>	Trait resilience <i>CD-RISC-10</i>	Subjective wellbeing <i>World Health Organization Well-Being Index (WHO-5)</i>
Bäcman et al, 2016 <sup>51</sup>	Naval deployment	Prior combat-related stress <i>Custom scale</i>	Positive affect <i>PANAS</i>
Gabriel et al, 2011 <sup>52</sup>	Job dissatisfaction <i>Custom checklist</i>	Trait resilience <i>CD-RISC-25*</i> Nurse-physician collegiality <i>Revised Nursing Work Index</i>	Positive affect <i>Custom scale</i>
Lai & Mak, 2009 <sup>53</sup>	Daily hassles <i>Inventory of College Students' Recent Life Experiences (ICSRLE)*</i>	Trait resilience <i>Multiple measures</i>	Mental health <i>General Health Questionnaire (GHQ-30)</i>
Leipold et al, 2019 <sup>54</sup>	Academic work-related stress <i>TICS</i>	Coping styles <i>Coping Orientation to Problems Experienced inventory (COPE)**</i>	Subjective wellbeing <i>Custom scale</i>
Lutz et al, 2020 <sup>55</sup>	Work-home boundary violations <i>Experimental task</i>	Trait resilience <i>BRS</i>	Positive affect <i>PANAS</i>
Sharda, 2022 <sup>56</sup>	Parenting stress <i>Parental Stress Scale</i>	Social support <i>Social Provisions Scale (SPS)</i>	Mental wellbeing <i>MHC-SF</i>
Sharda et al, 2019 <sup>57</sup>	Parenting stress <i>Parental Stress Scale</i>	Social support <i>Multidimensional Scale of Perceived Social Support (MSPSS)</i>	Quality of life <i>Assessment of Quality of Life (AqoL-6d)</i>
Shi et al, 2021 <sup>58</sup>	Emotional dissonance <i>Frankfurt Emotional Work Scales*</i>	Trait resilience <i>BRS</i>	Positive affect <i>PANAS**</i>
Udayar et al, 2020 <sup>59</sup>	Work stress <i>General Work Stress Scale (GWSS)</i>	Big Five personality traits <i>NEO Five-Factor Inventory – Revised (NEO FFI-R)</i>	Life satisfaction <i>SWLS</i>
van Erp et al, 2015 <sup>60</sup>	Bystander conflict <i>Experimental tasks</i>	Trait resilience <i>Custom scale</i>	Positive affect <i>Job Affective Well-being Scale (JAWS)**</i> , <i>custom scale</i>
Wepf et al, 2022 <sup>61</sup>	Caring responsibilities <i>Custom measures</i>	Trait benefit-finding <i>General Benefit Finding Scale (GBFS)</i>	Mental wellbeing <i>WEMWBS</i>

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Table 1 (Continued).

Health conditions (non-COVID)			
Author	Stressor	Moderator	Outcome
Bos et al, 2016 <sup>62</sup>	Psychological symptoms <i>Depression Anxiety Stress Scales – 42-item version (DASS-42)</i> <i>Single-item</i>	Self-defeating humour <i>Humor Style Questionnaire (HSQ)</i> Having a romantic partner <i>Single-item</i>	Life satisfaction <i>Single-item</i> Happiness <i>Single-item</i>
Delfabbro et al, 2011 <sup>63</sup>	Body image dissatisfaction <i>Single-item</i>	Family/social functioning <i>Family Assessment Device (FAD), custom measures</i>	Life satisfaction <i>Unnamed scale**</i> Self-esteem <i>Rosenberg Self-Esteem Scale (RSES)</i>
Hajek & König, 2019 <sup>64</sup>	Negative health comparisons <i>Single-item</i>	Self-efficacy <i>Generalized Self-Efficacy scale**</i> Optimism <i>Unnamed scale</i> Self-esteem <i>RSES</i>	Positive affect <i>PANAS</i> Life satisfaction <i>SWLS</i>
Kratz et al, 2007 <sup>65</sup>	Pain severity <i>Single-item</i>	Pain acceptance <i>Custom scale</i>	Positive affect <i>PANAS</i>
Okun et al, 2011 <sup>66</sup>	Chronic health conditions <i>Custom measure</i>	Past-year volunteering <i>Single-item</i>	Positive affect <i>WHO-5</i>
Plexico et al, 2019 <sup>67</sup>	Stuttering <i>Self-identified by participants</i>	Trait resilience <i>CD-RISC-25</i> Coping styles <i>Brief COPE**</i>	Life satisfaction <i>SWLS</i>
Windle et al, 2010 <sup>68</sup>	Chronic physical illnesses <i>Older American's Resources and Services questionnaire (OARS)</i>	Trait resilience <i>Unnamed scale</i>	Life satisfaction <i>Life Satisfaction Index Z (LSI-Z)</i>
COVID-19 stressors			
Author	Stressor	Moderator	Outcome
Barni et al, 2020 <sup>69</sup>	COVID-19 exposure and fear <i>Single-item measures</i>	Sense of coherence <i>Sense of Coherence Scale</i>	Psychological wellbeing <i>Short-Form Health Survey (SF-12)**</i>
Cunningham et al, 2021 <sup>70</sup>	Social isolation <i>Custom scale</i>	Age Years	Positive affect <i>PANAS</i>
Faul & De Brigard, 2022 <sup>71</sup>	Concern about pandemic <i>Custom scale</i>	Trait nostalgia <i>Nostalgia Inventory</i>	Positive mood <i>Profile of Mood States (POMS)*</i> Mood change <i>Single-item measures</i>
Haghighyeghi et al, 2023 <sup>72</sup>	Pandemic-related disruptions <i>Single-item</i>	Physical activity <i>Single-item</i>	Psychological wellbeing <i>Psychological Well-Being Scale (PWB-18)</i>
Hu et al, 2023 <sup>73</sup>	Perceived stress <i>Unnamed scale</i>	Trait resilience <i>Unnamed scale</i>	Life satisfaction <i>Unnamed scale</i>

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**Table I** (Continued).

Paredes et al, 2021 <sup>74</sup>	Perceived COVID threat <i>Custom scale</i>	Trait resilience <i>CD-RISC-25**</i>	Positive affect <i>PANAS**</i>
Shoshani, 2023 <sup>75</sup>	Living through pandemic <i>Pre-pandemic to post-fifth wave</i>	Social support <i>MSPSS</i> Daily routine <i>Adolescent Routines Questionnaire (ARQ)</i>	Positive affect <i>PANAS-C</i> Life satisfaction <i>BMSLSS</i>
Wang et al, 2021 <sup>76</sup>	Health-related stress <i>Multicultural Events Schedule for Adolescents</i>	Coping styles <i>Response to Stress Questionnaire (RSQ)**</i>	Positive affect <i>PANAS-C</i>

**Notes:** As in the body of the review, the studies are grouped under headings according to the type of stressor involved. For each study, the key variables (stressors, moderators, and outcomes) are listed, and the measures used to assess these variables (where applicable) are shown in italics. Where established measures have been employed, they are listed by name; otherwise, the type of measure (eg, custom checklist, unnamed scale, single-item) is stated. \*Modified/adapted from original. \*\*Shortened/reduced/abbreviated version.

## Adverse Childhood Experiences (ACEs)

Our search identified seventeen studies that examined resilience in terms of the effects of ACEs (occurring during childhood or adolescence) on positive affect. In this context, the most commonly studied resilience resources are internal ones, especially traits. Three studies have investigated the role of **trait resilience** specifically, with mixed results. In a study of adolescents residing in the Netherlands, Sleijpen et al<sup>19</sup> found that trait resilience moderated the relationship between PTEs (eg, loss of parent, abuse, lack of shelter) and satisfaction with life in a sample of 148 non-refugee secondary school students but not in a sample of 117 refugees residing in asylum seeker centres (who had experienced a significantly higher number and variety of PTEs than the non-refugees). In the non-refugees, number of PTEs was negatively associated with satisfaction with life, with this association being non-significant in those with above-average levels of trait resilience and increasingly negative with increasingly below-average levels of trait resilience. The absence of a similar moderation effect in the refugees suggests that individual differences in trait resilience may not always be enough to moderate the effects of the PTEs typically experienced by asylum seekers, who are at a markedly higher level of risk and experience different stressors from those typically encountered by non-refugees. The other two studies investigated trait resilience in relation to retrospectively reported ACEs. In a sample of 255 Korean unwed mothers, Kang et al<sup>13</sup> found that a higher number of recalled ACEs was associated with greater perceived discrimination, which in turn was associated with lower wellbeing, especially among those with lower trait resilience. In addition, in a study of 98 Australia-based university students, Tung et al<sup>23</sup> divided the participants into three categories: control (few ACEs, low depression and anxiety), vulnerable (more ACEs, low trait resilience), and resilient (more ACEs, high trait resilience). The vulnerable group (who had lower trait resilience) reported lower positive affect than the control group and higher negative affect than the other two groups, while the resilient group (who had higher trait resilience) did not differ from the control group in positive affect.

Five studies have examined internal resilience resources other than trait resilience. Cohen et al<sup>11</sup> used clustering analyses to divide 584 US adolescents into distinct profiles, representing differing levels of psychological distress and mental wellbeing in response to previous experiences of PTEs (community violence and emotional maltreatment). Participants who had both high wellbeing and low distress (accounting for PTE exposure) reported the highest levels of **trait emotional intelligence**. Moreover, among those who had low wellbeing, emotional intelligence was higher in those who reported low (rather than high) distress. In a study of over 6000 US adults, Turiano et al<sup>24</sup> found that **perceived control** beliefs moderated the association between recalled childhood misfortune and current affective outcomes, with childhood misfortune predicting lower positive affect and greater negative affect more strongly among those with a lower level of perceived control over their lives. Similarly, Seon and Smith-Adcock<sup>18</sup> found a buffering effect of **meaning in life** in a nationally representative sample of over 4800 US 15-year-olds, whereby the negative association between bullying victimisation (via verbal, physical, or relational bullying) and life satisfaction was weaker among those

with a greater sense of life meaning. Likewise, in a sample of 454 Polish adolescents, Riley et al<sup>17</sup> found that **problem-solving coping** strategies (but not social support-seeking or avoidant strategies) significantly moderated the negative relationship between victimisation and emotional wellbeing. Those who had experienced more types of victimisation (across categories such as bullying, crime, and child maltreatment) reported lower life satisfaction and lower positive affect, but less so if they reported greater use of problem-solving coping. Coping strategies were also examined by Sorek et al<sup>22</sup> in a study of 122 Israeli children of divorced parents. It was found that child-rated parental conflict was associated with lower life satisfaction only among children with low levels of **active coping**. However, this moderation effect was observed for only one of the two measures of life satisfaction employed by the authors, and such effects were not observed when happiness or psychological wellbeing were the outcomes. When mother-rated parental conflict was considered, there was only one interaction effect, with reduced life satisfaction (on only one of the two measures) only in children with high self-blame.

A further five studies have examined the role of external resilience resources, specifically social or interpersonal connections. In an additional analysis from the aforementioned study of children of divorced parents, Sorek<sup>21</sup> found that parental conflict was associated with lower life satisfaction only among children with less-close **relationships with their grandparents**. However, this interaction effect was found for only one of the two child-rated measures of parental conflict (feeling caught between one's parents), and it was not found when happiness or psychological wellbeing was the outcome. DiClemente et al<sup>12</sup> examined the effects of violence exposure on the positive affect of 269 Black American adolescents, finding no evidence that family cohesion, neighbourhood cohesion, or school cohesion moderated the relationship between violence exposure (over the previous 12 months) and current positive affect in cross-sectional analyses of the participants in the seventh and eighth grades. In fact, violence exposure had no main effect on positive affect in either grade. In longitudinal analyses, violence exposure in seventh grade negatively predicted positive affect in eighth grade (controlling for seventh grade positive affect), and this relationship was moderated by **family cohesion** (but not neighbourhood or school cohesion), with the violence-affect relationship becoming less negative with higher levels of cohesion. However, this longitudinal result was found only in boys, and while the authors tested innumerable two-way and three-way interaction effects, they did not report any correction of the significance threshold to account for multiple testing. More straightforward results were obtained by Nurius et al<sup>15</sup>, who investigated retrospectively reported ACEs in a sample of over 13,000 US adults. The authors found a weaker negative correlation between number of recalled ACEs and perceived wellbeing among those with a greater **sense of community**, referring to adequate social support and satisfaction with one's neighbourhood. External resilience resources have also been examined in the context of adolescent adversity related to ethnic or cultural differences. In a study of 247 British secondary school students of South Asian descent, Bagci et al<sup>9</sup> found that perceived ethnic discrimination was negatively related to psychological wellbeing only among those with fewer **cross-ethnic friendships**. In addition, in a study of 524 US adolescents of Mexican descent,<sup>16</sup> bicultural stress (ie, stress related to maintaining one's heritage culture while adapting to the surrounding culture) had a stronger negative association with life satisfaction among those with stronger **connections to their female caregiver** (while male caregiver connectedness did not moderate this association). This may have been due to a floor effect, because those with lower female caregiver connectedness had lower life satisfaction even at low levels of bicultural stress.

Apart from research on internal and external resilience resources, four studies have considered physiological or physical health factors in the context of resilience to ACEs. In a study of over 3000 US adults, Nishimi et al<sup>14</sup> divided the participants into four categories: resilient (adversity-exposed, good mental health), non-resilient (adversity-exposed, poor mental health), positive functioning (not adversity-exposed, good mental health), and unfavourable functioning (not adversity-exposed, poor mental health). These groups were then compared in terms of **physical health behaviours** (non-smoking, moderate alcohol consumption, regular exercise, healthy nutrition) and body weight. The resilient group did not differ from the positive functioning group except on non-smoking (there being significantly more non-smokers in the latter group). Furthermore, the resilient group was significantly healthier than the non-resilient group in terms of physical activity, nutrition, and body weight. Two studies have employed cardiac measures as indicators of resilience resources, given that emotional and behavioural regulation have been linked with variables such as respiratory sinus arrhythmia and heart rate. In a study of 92 US preschool children, Cipriano et al<sup>10</sup> investigated whether **vagal suppression** moderated the

relationship between violence exposure and three outcome variables (emotional problems, frustration, and positive affect), finding an interaction effect on emotional problems only. In contrast, in a sample of 150 US undergraduate students with a history of childhood maltreatment, Somers et al<sup>20</sup> found a moderating effect of **heart rate reactivity**, whereby maltreatment was negatively associated with positive affect in those with above-average or average heart rate reactivity, but not in those with below-average reactivity. One key difference between the Cipriano et al<sup>10</sup> and Somers et al<sup>20</sup> studies (aside from the different cardiac measures employed) lies in their sample demographics, as the former recruited children with current or recent adversity whereas the latter employed an adult sample with recalled ACEs. Lastly, in a study of over 4800 UK adults, Armitage et al<sup>8</sup> employed **polygenic scores** for wellbeing and depression (ie, genetic correlates of mental health) as potential moderators of the effect of peer victimisation at age 13 on mental wellbeing at age 23. The authors found no evidence of moderation, leading them to conclude that genetic profiling may not be useful for identifying those who are more or less resilient to bullying.

Together, studies of the effects of ACE on positive affect have shown that internal resilience resources such as trait resilience and external resources such as social support may serve to mitigate the negative impact of ACEs in both childhood and adulthood, although the evidence is mixed in some areas. There is also limited research involving physiological indices of resilience, with evidence that physical and cardiovascular health factors may be influential.

## Adult Experiences of Mistreatment or Trauma

When shifting the lens to adult experiences of adversity and their effects on positive affect, our search yielded only four studies of resilience, all of which examined internal resilience resources. Two of the studies focused on minority populations at greater risk of suffering discrimination. In a sample of 242 Native American and Alaskan undergraduates, Fetter et al<sup>25</sup> examined a culturally specific stressor (perceived historical loss) as a predictor of mental wellbeing. The results showed a significant interaction effect whereby there was a weaker negative relationship between historical loss and wellbeing among those with a stronger **sense of ethnic identity** (although this resource did not moderate the effect of historical loss on psychological distress). Similarly, in a study of 872 Chinese impoverished college students, Liu et al<sup>27</sup> found a weaker negative association between perceived discrimination and subjective wellbeing among those with higher levels of **belief in a just world** (ie, the belief that the world is ultimately fair). This study also found that trait resilience moderated the impact of discrimination on self-esteem, but not as expected: Those with higher trait resilience had a larger self-esteem advantage at lower rather than higher levels of discrimination, possibly indicating a floor effect.

The other two studies examined stressors related to conflict or mistreatment. In a sample of over 1100 Spanish university students, Yubero et al<sup>28</sup> found a weaker negative relationship between chronic bullying victimisation (at school and university) and psychological wellbeing among those with higher levels of **trait resilience**, suggesting a buffering effect. Finally, Lee et al<sup>26</sup> employed a clustering analysis of posttraumatic stress symptoms and mental wellbeing in a sample of 367 South Korean male veterans of the Vietnam War, which yielded five distinct classes, including groups labelled “resilient”, “moderate distress”, and “severe distress”. The resilient group, who reported the highest levels of wellbeing, scored higher than the other groups on a range of resilience resources, including **optimism**, **positive appraisals** of military service, and **social support**.

## Stressful Life Events or Everyday Stressors

Our search returned twenty-one studies that examined resilience in terms of the effects of stressful life events on positive affect, with the majority investigating how these effects may be moderated by internal resilience resources such as personality traits. Two studies have examined **trait resilience** specifically, with mixed findings. In a study of 95 Mexican informal caregivers, Ertl et al<sup>36</sup> observed a weaker correlation between perceived stress over the past month and mental quality of life (but not physical health-related quality of life) among those with higher trait resilience. In contrast, in a study of 486 Chinese rural-to-urban migrant school students, Huang et al<sup>42</sup> found that family socioeconomic status (SES) was positively correlated with life satisfaction only in those whose participating parent was low in positive affect. The children’s own levels of trait resilience did not moderate the relationship between SES and life satisfaction (although trait resilience moderated the relationship between SES and emotion regulation).

Five studies have looked at personality traits other than trait resilience. In a longitudinal study of 797 community adults across 42 countries, Goodman et al<sup>38</sup> found that higher **trait hope** at each timepoint predicted a weaker negative association between stressful life events and subjective wellbeing over the following three months. However, such interaction effects were not observed when other traits, including grit, meaning in life, curiosity, gratitude, perceived control, and use of personal strengths, were analysed as moderators. In another longitudinal study, involving over 1100 Greek university students, Arampatzi et al<sup>30</sup> found that those with more **positive expectations** at baseline experienced smaller drops and larger rebounds in happiness over the subsequent timepoints, which coincided with major socio-economic upheaval in the target population (the Greek bailout referendum). Similarly, in a nationwide study of over 15,000 Australian adults,<sup>31</sup> the negative associations between positive affect and both neighbourhood crime levels and being a victim of crime were smaller among those with a more **internal locus of control** (ie, those who perceived themselves as being more in control of the events in their lives). Additionally, in a study of 235 US adults who identified as LGBQ (lesbian, gay, bisexual, and/or queer), Chong et al<sup>33</sup> found that daily negative experiences related to the participant's sexual orientation were associated with lower positive affect, but not in those with high **self-compassion** (these experiences were also associated with higher negative affect, but this relationship was not moderated by self-compassion). Furthermore, in a laboratory study of 130 US university students, Corral-Frías et al<sup>34</sup> found that an experimentally contrived stressor resulted in reduced positive affect and increased negative affect in participants, but those with higher **reward sensitivity** reported smaller decreases in positive affect.

Three studies have examined **cognitive reappraisal** (an emotion regulation strategy) or related practices as resilience resources. Hodzic et al<sup>41</sup> investigated emotional intelligence (labelled “trait meta-mood” by the authors) in a study of 835 university students across three countries (Spain, Portugal, and Brazil). Perceived stress over the past month was negatively correlated with life satisfaction, but less so among those with higher scores on a trait meta-mood subscale measuring “emotional repair” (ie, using positive thinking to overcome negative moods), a construct comparable with cognitive reappraisal. Furthermore, in a daily-diary study of 236 English undergraduate students, Johnson et al<sup>44</sup> found that greater daily stressors were associated with lower positive mood and greater negative mood, with the latter association being weaker among those who were higher in cognitive reappraisal and lower in brooding (a rumination style that contrasts with reflection). However, the relationship between daily stressors and positive mood was not moderated by any of the emotion regulation strategies or rumination styles under study. Conversely, in an experimental intervention involving 83 Canadian undergraduates, Philippe et al<sup>48</sup> observed smaller reductions in positive emotion when participants had been randomly allocated to a 10-minute resilience intervention (guided cognitive reappraisal) prior to a negative mood induction, rather than one of the control conditions (neutral music or guided relaxation).

Five studies have assessed external resilience resources, especially resources related to social or interpersonal factors. Two of these studies examined moderators of the relationship between excessive use of digital technology (a common source of everyday stress) and positive affect. Jagtiani et al<sup>43</sup> assessed the use of social networking sites (SNS) in a nationally representative sample of over 2200 UK young adults aged 16–21 who still lived with their parents. There was a significant interaction effect whereby heavy SNS use was associated with low mental wellbeing primarily among those who did not share any **evening meals with their family**. Mutz et al<sup>46</sup> evaluated the subjective wellbeing of 76 adolescents from German-speaking countries before and after they participated in 10 days of **outdoor group recreational activities** (eg, hiking, climbing, canoeing) in Southern France. For those who reported  $\leq 3$  hours per day of screen time (ie, leisure time spent in front of a television or computer), life satisfaction was high prior to the outdoor program and did not significantly increase over time, but for those who reported  $>3$  hours of screen time per day, life satisfaction was initially low but then increased significantly. However, this moderation effect was not observed for hedonic balance (ie, positive affect minus negative affect), with hedonic balance increasing over time regardless of baseline screen time levels. It should also be noted that the resilience resource in this study (outdoor group recreation) comprised not only social interaction but also physical activity and exposure to natural environments, which may bring their own benefits with regard to resilience.

The other three studies of external resources also returned mixed results. In a nationally representative sample of 373 US older adults, Greenfield and Marks<sup>39</sup> measured the stressor of “major role-identity absences”, referring to a lack of important interpersonal roles (ie, among those without a job, spouse, or child). Greater role-identity absences were

associated with a lower sense of purpose in life only among those who did not engage in monthly volunteering, but such interaction effects were not found when the outcome was either positive or negative affect. Furthermore, in a study of 726 Athenian high school students, Hatzichristou et al<sup>40</sup> found that everyday life difficulties (due to the contemporaneous Greek economic recession) were negatively correlated with joy in life and self-esteem, but these negative associations were lessened by positive peer relations only among those students who were academic high-achievers. Similarly, in a study of 159 US adolescents with a mobility disability,<sup>29</sup> Alriksson-Schmidt et al found that everyday life stress (including disability-related stress) was negatively correlated with quality of life, but this association was not moderated by social competence, peer social engagement, or family functioning.

Two studies have examined **multiple resilience resources**, covering both internal and external factors. In a study of 197 Malaysian students from disadvantaged households, Noor and Alwi<sup>47</sup> divided the participants into three groups, labelled “adapted” (low life stress and high life satisfaction), “resilient” (high stress but high satisfaction), and “maladapted” (high stress and low satisfaction). The adapted and resilient students reported better mother-child communication and higher levels of support from their teachers; they also had higher scores on the Big Five personality traits (with Neuroticism reverse-scored) than the maladapted students. Similarly, in a nationwide study of almost 10,000 US adults, Bucknor and Derringer<sup>32</sup> found that life stress had a smaller negative association with positive affect among those who reported greater levels of social support; lower levels of loneliness; higher levels of subjective wellbeing; higher scores on the Big Five (with Neuroticism reverse-scored); higher scores on trait measures of optimism, mastery, purpose, and religiosity/spirituality; lower scores on pessimism and hopelessness; and higher levels of educational attainment. The same study also examined genetic data (European ancestries only), finding equivalent moderation effects with the polygenic scores for extraversion, neuroticism, subjective wellbeing, and educational attainment.

Six studies have examined whether the effects of life stress can be moderated by **other stressful experiences**. Three of these studies have suggested that previous adversity can lead to increased resilience against later stressors, provided the earlier adversity was not too severe. In a nationally representative study of over 2000 US adults, Seery et al<sup>49</sup> observed a curvilinear relationship between lifetime adversity and current life satisfaction, whereby satisfaction was highest among those who had experienced low levels of adversity, rather than no adversity or high levels of adversity. This study also found that lifetime adversity moderated the relationship between recent adversity (in the last 6 months) and life satisfaction, with recent adversity having the weakest negative association with life satisfaction among those who reported low levels of lifetime adversity. Similarly, in a study of 122 US women who had survived breast cancer, Dooley et al<sup>35</sup> found that the number of acute stressors in the one’s lifespan (pre-cancer diagnosis) predicted current levels of positive affect and cancer-related intrusive thoughts in a curvilinear fashion, whereby those who had experienced a moderate number of stressors (rather than a low or high number) reported greater positive affect and fewer intrusive thoughts. However, this study also found a straightforward linear relationship between acute stressors and negative affect, with greater stress predicting greater negative affect at a fixed rate. Mixed results were also obtained by Lazić et al<sup>45</sup> in a longitudinal study of 293 Serbian undergraduate students. The authors found that recent life stress was associated with lower life satisfaction in those who reported low or high but not moderate levels of perceived negative childhood experiences (PNCE); however, PNCE did not moderate the negative relationship between recent stress and positive affect (nor the positive relationship between recent stress and negative affect).

The other three studies have suggested that prior stressful experiences can compound rather than mitigate the effects of subsequent stressors. In a longitudinal experience-sampling study of 156 German adults, Gerstberger et al<sup>37</sup> found that current stress was negatively associated with current positive affect, and that this association was larger in those who reported greater ongoing chronic stress. This study also found that greater physical activity (since the last experience sample) predicted a weaker correlation between current stress and current negative affect (but not current positive affect), but this interaction was evident only for those who rated their past experiences of major life events as less severely stressful. In addition, the aforementioned studies by Nurius et al<sup>15</sup> and Tung et al<sup>23</sup> also shed light on the interaction between past and present stressors. Nurius et al<sup>15</sup> observed a stronger association between adult adversity and psychological distress among those who recalled greater childhood adversity, although this interaction effect was not found with perceived wellbeing as the outcome. Similarly, Tung et al<sup>23</sup> found that higher daily stress was associated with

greater negative affect more strongly in the vulnerable group than in the resilient or control groups, but there was no such moderation of the association between daily stress and positive affect.

In summary, there is evidence that a range of internal and external resilience resources may mitigate the impact of everyday life stress on positive affect and related outcomes. Interestingly, a few studies have suggested that stressful experiences themselves can foster resilience against subsequent stressors, provided the earlier stress was not excessive. Such stress-inoculation effects have been found chiefly in the context of everyday stressors, presumably because more severe stressors are typically too harmful to yield net benefits (at least in terms of positive affect). However, there is also evidence that stressful experiences can compound the negative impact of later adversity, so the question of stress-inoculation clearly warrants continued investigation.

## Occupational Stressors

Our search identified thirteen studies that examined resilience in terms of the effects of occupational stressors (including academic and childrearing stressors) on positive affect, with the majority investigating how this impact may be moderated by internal resilience resources, especially traits. Six studies (across five papers) have examined **trait resilience** specifically, with mixed results. In an experience sampling study of 65 full-time, guest-facing employees of US hotels, Shi et al<sup>58</sup> found that emotional dissonance (needing to show guests a different emotion from one's actual feelings) was associated with lower positive affect, lower job satisfaction, and greater intention to leave the job only in those with low trait resilience (although there was no such interaction in relation to negative affect). In a longitudinal study of 57 US nurses, Gabriel et al<sup>52</sup> asked the participants to report the extent to which they had performed their patient-facing tasks (direct care) and other tasks (indirect care) to their satisfaction, after each of six consecutive shifts (thus, a lack of satisfaction with one's caregiving constituted the occupational stressor). Direct care satisfaction predicted greater positive affect and lower negative affect (post-shift minus pre-shift), but neither of these associations was moderated by trait resilience or ratings of nurse-physician collegiality. However, while indirect care satisfaction did not have a main effect on positive affect, there were moderation effects whereby indirect care satisfaction predicted greater positive affect only at lower levels of trait resilience or collegiality (collegiality also moderated the association between indirect care satisfaction and negative affect). In a roleplay-based study of 66 Dutch paramedics, van Erp et al<sup>60</sup> had the participants respond to a simulated medical emergency involving interference from a bystander. Higher perceived interference was correlated with lower positive affect, both directly and indirectly via more-compromised cognition (ie, poorer concentration on the emergency), and the relationship between perceived interference and cognition was stronger in those with lower trait resilience. The authors published this roleplay-based study alongside a randomised experiment of bystander conflict in a university student setting. In this experiment, 47 Dutch students completed mathematical and grammatical exercises while a bystander was either silent or loud and rude. The latter condition resulted in lower positive affect, greater negative affect, and more unfavourable appraisals of the bystander, but only the effect on appraisals (not the effects on positive and negative affect) was especially strong among those with lower trait resilience. In another experimental study, of 337 German smartphone-owning employees, Lutz et al<sup>55</sup> had the participants react to imaginary scenarios wherein the work-home boundary was violated and they were pressured via text message to interrupt their current activity (by a friend/colleague requesting a call during/outside working hours). Higher pressure predicted greater negative affect but had no impact on positive affect, and trait resilience was not a significant moderator with either positive or negative affect as the outcome. In a study of 631 Ghanaian full-time employees, Annor and Amponsah-Tawiah<sup>50</sup> found that workplace bullying was negatively associated with mental wellbeing more strongly among those with higher trait resilience. The authors found this result contradictory to the claim that trait resilience is protective, although the data indicate a possible floor effect, whereby trait resilience correlates with wellbeing but not at high levels of bullying (in which case wellbeing bottoms out for everyone).

Four studies have examined occupational stressors in the context of personality traits other than trait resilience. In a longitudinal study of over 1200 Swiss employees, Udayar et al<sup>59</sup> found that work stress at baseline positively predicted work stress 12 months later across all participants, but baseline work stress negatively predicted 12-month life satisfaction only in those with an "oversensitive" personality profile, characterised by lower levels of **extraversion** and **conscientiousness**, and higher levels of **neuroticism**. In a study of over 2500 Swiss students in secondary school or

vocational training, Wepf et al<sup>61</sup> found that the experience of being a carer (for a relative or close friend with a health problem) was negatively correlated with mental wellbeing only in those with lower levels of “**trait benefit-finding**” (ie, the disposition to perceive positive changes following adversity). In a longitudinal study of 237 Hong Kong-based university students, Lai and Mak<sup>53</sup> found that daily hassles (in the university student context) over a one-month period predicted lower mental wellbeing only among those with low baseline levels of **optimism, self-esteem, and perceived control**. In a study of over 1600 German secondary school and university students, Leipold et al<sup>54</sup> found that perceived stress related to one’s academic work was negatively correlated with subjective wellbeing, but less so among those who were higher in either **meaning-focused coping** (involving acceptance and positive reinterpretation) or **social support-seeking** (ie, seeking both instrumental and emotional support). A third coping style (problem-focused coping) did not moderate the stress-wellbeing relationship.

Two studies, both in the childrearing context, have examined external resilience resources (specifically, forms of **social support**) as moderators of the effects of occupational stressors. In one study, of 139 US licensed foster parents, Sharda<sup>56</sup> found that self-reported parenting stress was negatively correlated with wellbeing, but less so among those who reported higher levels of social support (received and given). In the other study, of 152 US kinship caregivers (ie, non-parental caregivers such as foster parents), Sharda et al<sup>57</sup> found that parenting stress was negatively correlated with psychosocial quality of life, but this relationship was not moderated by received social support.

A single study has shed light on whether the effects of occupational stress can be moderated by **prior stressful experiences**. In this study, Bäckman et al<sup>51</sup> assessed 129 Swedish marines before and after an anti-piracy naval deployment. Interestingly, those with prior experiences of combat-related stress had lower levels of positive affect and higher levels of negative affect than their colleagues before but not after the deployment. This finding was not reported as a test of moderation, and it might merely reflect regression to the mean, but it points to a possible stress-inoculation effect that may warrant further study.

In summary, a number of studies have found that trait resilience and other personality traits may mitigate the negative impact of occupational stressors on positive affect, but the evidence is limited and mixed with regard to the possible protective role of social support in this context. It would also be unsurprising if stress-inoculation played a role in this context, given that occupational stressors are typically similar in severity to everyday life stressors (ie, stressful but not traumatic).

## Health Conditions (Other Than COVID-19)

Our search returned seven studies that examined resilience in terms of the effects of health conditions (other than COVID-19) on positive affect. Five of these studies focused on internal resilience resources. In a study of over 1800 British older adults, Windle et al<sup>68</sup> examined whether **trait resilience** significantly moderated the negative association between number of chronic physical illnesses and life satisfaction across four age groups (50–59, 60–69, 70–79, and 80–89 years). There was a significant moderation effect in each group except the youngest one, but the nature of the effect was not uniform. In the 60–69 and 70–79 year old groups, the association between illness and life satisfaction was more negative among those with lower trait resilience. However, in the 80–89 year old group, this association was steeper for those with higher trait resilience. This seemingly inconsistent finding may have been due to a floor effect, because those aged 80–89 with low trait resilience had low levels of life satisfaction even when they reported few chronic illnesses. In addition, in a US-based study of 94 adults with or without stuttering, Plexico et al<sup>67</sup> found that stuttering was associated with lower satisfaction with life scores at lower levels of trait resilience but not at higher levels of trait resilience; however, neither adaptive nor maladaptive coping style was found to moderate the negative association between stuttering status and satisfaction with life. In a longitudinal, nationally representative study of over 11,000 German adults aged 40 years and over, Hajek and König<sup>64</sup> assessed how favourably the participants rated their own health relative to others of the same age, and whether these health comparisons became more or less favourable over time. Among those whose comparisons worsened from “the same” to “much worse”, there was a corresponding reduction in life satisfaction and an increase in negative affect. However, the effect on life satisfaction was weaker among those with higher **self-efficacy**, while the effect on negative affect was weaker among those with higher optimism or higher self-efficacy. Furthermore, while there was no main effect of worsened health comparisons on positive affect, there was an interaction effect reflecting smaller reductions in positive affect among those with greater **optimism** or **self-esteem**. In a study of

over 12,000 adults from the general Dutch population, Bos et al<sup>62</sup> found that **self-defeating humour** moderated the negative association between symptoms of depression, anxiety, and stress and subjective wellbeing, with a weaker association among those higher in this form of humour. However, no such interaction effects were found when other factors were analysed as moderators, including trait empathy, religious belonging, occupation, and three other styles of humour (affiliative, self-enhancing, and aggressive). A null result was also obtained by Kratz et al<sup>65</sup> in a longitudinal study of 122 US women with osteoarthritis and/or fibromyalgia. The authors found that **pain acceptance** did not moderate the negative association between weekly worst pain severity and weekly positive affect (although the positive relationship between pain severity and negative affect was weaker among those with greater pain acceptance).

Three studies have investigated external resilience resources as moderators of the impact of illness on positive affect, with mixed findings. In a sample of over 4000 Arizonan adults (weighted to be representative of the statewide adult population), Okun et al<sup>66</sup> investigated whether **volunteering** moderated the association between number of chronic physical health conditions and positive affect. Those with more chronic conditions reported both lower positive affect and lower trait resilience on average, but these deficits were significantly smaller among those who had engaged in volunteering in the previous 12 months (compared with those who had not). Furthermore, in the aforementioned study by Bos et al<sup>62</sup> it was found that for participants with **a partner**, psychological distress symptoms had a weaker negative association with subjective wellbeing. However, Delfabbro et al<sup>63</sup> investigated the moderating influence of interpersonal factors in a study of body image satisfaction versus dissatisfaction, with a sample of over 1200 Australian secondary schools students. A range of potential moderators, reflecting sociability and family functioning (eg, extraversion, neuroticism, relationship status, number of friends, family adjustment), were tested, but none significantly moderated the negative relationship between body image dissatisfaction and self-esteem. However, in a sub-analysis of only those who were dissatisfied with their physical appearance, participants above the 90th percentile on **self-esteem** were found to be more extraverted and have better-functioning families, relative to those below that threshold.

In summary, both internal and external resilience resources have been found to moderate the relationship between health conditions and positive affect, with most of the studies pertaining to personality traits and other internal attributes. However, this area of research has covered only a limited range of health conditions to date. There may be certain forms of physical or mental illness whose impact on positive affect is more (or less) amenable to mitigation by a given resilience resource. Clearly, further research is needed in this domain.

## COVID-19

Our search identified nine studies on resilience in relation to the COVID-19 pandemic and its effects on positive affect. Almost all of these studies specified that data collection occurred under strict lockdown conditions (between the years 2020 and 2021). Given that individuals had little control over their external circumstances during the lockdowns, it is understandable that many of the studies focused on internal resilience resources (such as trait resilience or other traits). However, a few researchers examined how other factors may have served as resilience resources during the pandemic.

Six studies (across five papers) investigated internal resilience resources as moderators, two of which focused on **trait resilience**. In a study of 711 Spanish university students, Paredes et al<sup>74</sup> found that the perceived threat of COVID-19 was negatively associated with positive affect via heightened pandemic-related anxiety about the future, with this indirect negative effect being stronger among those with lower trait resilience. In addition, in a study of over 1000 Chinese university students, Hu et al<sup>73</sup> found that perceived stress had a stronger negative association with both social adaptation (to the pandemic) and life satisfaction among those with lower levels of trait resilience (called “emotional resilience” by the authors). However, Hu et al neglected to specify the names of the scales they employed to measure these variables, so we are limited in the extent to which we can interpret their findings (eg, it is unclear whether their measure of perceived stress pertained to stress in general or pandemic-related stress specifically).

The other four studies of internal resources yielded mixed results. In a sample of over 2700 adults residing in Italy during the 2020 lockdown, Barni et al<sup>69</sup> found that participants who knew someone that had contracted the coronavirus reported lower psychological wellbeing, but less so if they had a greater **sense of coherence** (SOC, ie, the view that one’s life and world are comprehensible, manageable, and meaningful). Participants with a greater fear of contracting the virus also reported lower wellbeing, but this association was stronger among those with greater SOC. However, this latter

finding may indicate a floor effect, because those with greater SOC had higher wellbeing across all levels of fear. Faul and De Brigard<sup>71</sup> examined whether trait nostalgia served as a resilience resource for US adults in the first wave (study 1, April 2020) and second wave (study 2, August 2020) of the pandemic. In study 1 (involving 134 participants), those who reported greater concern about the pandemic were more likely to report worsened mood over the past month, but not if they were high in **nostalgia**. However, this moderation effect was not found for ratings of mood change over the past week. Furthermore, in study 2 (involving 159 participants), nostalgia did not moderate the association between pandemic concern and ratings of mood change over the past month nor the past week. In addition, in study 1, it was found that pandemic concern had a stronger negative association with positive mood among those lower in trait nostalgia, but again, this moderation effect was not replicated in study 2. During the April 2021 period, in a nationally representative diary study of 444 US adolescents, Wang et al<sup>76</sup> found no evidence that either primary engagement coping (similar to problem-solving coping) or secondary engagement coping (similar to emotion regulation) moderated the negative association between daily health-related stress (including pandemic-related stress) and either same-day or next-day positive affect. Primary engagement coping also had no moderation effects on negative affect, although secondary engagement coping mitigated the negative association between health-related stress and both same-day and next-day negative affect. Wang et al also measured whether an external resource – parental support – moderated the relationship between daily stress and positive or negative affect. Parental support did not moderate the relationship with positive affect, and although it significantly moderated the relationship with negative affect, the data showed that parental support was not a significant moderator at higher levels of stress.

Three other studies investigated moderators other than internal resources. In a longitudinal study of the mental health outcomes of over 5000 Israeli children and adolescents in the period from pre-pandemic (September 2019) to post-fifth wave (May 2022), Shoshani<sup>75</sup> observed smaller reductions in positive emotion, life satisfaction, and gratitude among participants who reported higher levels of **social support** and/or higher levels of **daily routine** (eg, more frequent engagement in social activities, family rituals, distance learning tasks). In a study of over 900 US adults during the first wave of the pandemic (March–April, 2020), Cunningham et al<sup>70</sup> found that those who reported greater social isolation had lower levels of positive affect. This negative association was stronger among older adults, possibly indicating a floor effect, because **older age** was associated with greater positive affect at all levels of social isolation. Indeed, the positive associations between social isolation and negative outcomes (including negative affect and depressive symptoms) were weaker among older adults. In a study of over 800 Iranian adults, Haghayeghi et al<sup>72</sup> found that participants who rated the pandemic as more disruptive to their lives reported lower levels of psychological wellbeing, but this negative association was weaker among those who reported smaller pandemic-related reductions in **physical activity**.

In summary, a range of resilience resources have been investigated as moderators of the effects of COVID-19 on positive affect, including internal resources such as trait resilience and other factors such as physical activity and age. Only two studies examined external resilience resources (parental support, social support, daily routine) in this context, with mixed findings.

## Positive Affect as a Moderating Resilience Resource

As mentioned earlier, most of the studies retrieved from our literature search were concerned with positive affect as an outcome of the resilience process, rather than as a resilience resource. However, of the few studies that examined positive affect as a moderator, there were at least two that fell under each of the six subheadings employed in the previous section of this review (except COVID-19, for which there was only one study), so we have retained these subheadings in the present section. See [Table 2](#) for a summary of the key variables in these studies.

## Adverse Childhood Experiences (ACEs)

In contrast to the relatively large number of studies examining the effects of ACEs on positive affect as an outcome, when we considered positive affect as a resilience resource, only two studies fit our search criteria. Both of these studies involved adult populations with negative childhood experiences that were retrospectively reported. In one study, involving a representative sample of over 19,000 US adults residing in Washington State, Logan-Greene et al<sup>78</sup> found that recalled ACEs were associated with poor physical and mental health among those with low **life satisfaction**, but not

**Table 2** Summary of Reviewed Studies on Positive Affect as a Resilience Resource

<b>Adverse childhood experiences (ACEs)</b>			
<b>Author</b>	<b>Stressor</b>	<b>Moderator</b>	<b>Outcome</b>
Arslan, 2023 <sup>77</sup>	Psychological maltreatment <i>Psychological Maltreatment Questionnaire (PMQ-B)</i>	Positive affect <i>Scale of Positive and Negative Experience (SPANE)</i>	Social wellbeing <i>Mental Health Continuum – Short Form (MHC-SF)</i>
Logan-Greene et al, 2014 <sup>78</sup>	ACEs <i>Custom checklist</i>	Life satisfaction <i>Single-item</i>	Physical and mental health <i>Single-item measures</i>
<b>Adult trauma</b>			
<b>Author</b>	<b>Stressor</b>	<b>Moderator</b>	<b>Outcome</b>
Gee et al, 2023 <sup>79</sup>	Potentially traumatic events <i>Australian Aboriginal Version of the Harvard Trauma Questionnaire (AAVHTQ)</i>	Multidimensional strengths <i>Aboriginal Resilience and Recovery Questionnaire (ARRQ)</i>	Trauma symptom severity <i>AAVHTQ</i>
Kumar et al, 2022 <sup>80</sup>	Posttraumatic stress <i>PTSD Checklist for DSM-5 (PCL-5)</i>	Optimism <i>Life Orientation Test – Revised (LOT-R)</i> Gratitude <i>Gratitude Questionnaire (GQ-6)</i>	Suicidal ideation <i>Single-item</i>
<b>Stressful life events</b>			
<b>Author</b>	<b>Stressor</b>	<b>Moderator</b>	<b>Outcome</b>
Brailovskaia et al, 2020 <sup>81</sup>	Stressful life events <i>Brief Daily Stressor Screening (BDSS)</i>	Mental wellbeing <i>Positive Mental Health scale (PMH)</i>	Suicidal ideation <i>Single-item</i>
de Vries et al, 2021 <sup>82</sup>	Negative life events <i>Shock-Processing Inventory List (SchIL)</i>	Life satisfaction <i>Satisfaction with Life Scale (SWLS)</i>	Anxiety and depression symptoms <i>Achenbach System of Empirically Based Assessment (ASEBA)</i>
Kathryn McHugh et al, 2013 <sup>83</sup>	Perceived stress <i>Perceived Stress Scale (PSS)**</i>	Positive affect <i>Profile of Mood States (POMS)</i>	Negative affect <i>POMS</i> Alcohol cravings <i>Obsessive-Compulsive Drinking Scale (OCDS)</i>
Riskind et al, 2013 <sup>84</sup>	Negative life events <i>Psychiatric Epidemiology Research Instrument (PERI)*</i>	Positive life events <i>PERI*</i>	Depressive symptoms <i>Beck Depression Inventory (BDI)</i>
<b>Occupational stressors</b>			
<b>Author</b>	<b>Stressor</b>	<b>Moderator</b>	<b>Outcome</b>
Maffoni et al, 2020 <sup>85</sup>	Lack of managerial support <i>Hospital Ethical Climate Survey (HECS)</i>	Positive affect <i>Positive and Negative Affect Schedule (PANAS)</i>	Moral distress <i>Moral Distress Scale – Revised (MDS-R)</i>
Viola et al, 2016 <sup>86</sup>	Low hardiness (trait resilience) <i>Dispositional Resilience Scale (DRS)</i>	Psychological wellbeing <i>Psychological Well-Being Scale (PWB-18)</i>	Lack of career readiness <i>Career Decision-Making Difficulties Questionnaire (CDDQ)</i>

(Continued)

Table 2 (Continued).

Health conditions (non-COVID)			
Author	Stressor	Moderator	Outcome
Siegmann et al, 2018 <sup>87</sup>	Depressive symptoms <i>Depression Anxiety Stress Scales – 21-item version (DASS-21)</i>	Psychological wellbeing <i>PMH</i> Life satisfaction <i>SWLS</i>	Suicidal ideation <i>Suicidal Behaviors Questionnaire – Revised (SBQ-R)</i>
Strand et al, 2006 <sup>88</sup>	Pain intensity <i>Single-item</i>	Positive affect <i>PANAS</i>	Negative affect <i>PANAS</i>
Yu et al, 2021 <sup>89</sup>	Depressive symptoms <i>Modified Depression Scale (MDS), Patient-Reported Outcomes Measurement Information System (PROMIS)</i>	Life satisfaction <i>Single item</i> Optimism <i>LOT-R</i>	Suicidality <i>Composite International Diagnostic Interview (CIDI)*</i>
Zautra et al, 2005 <sup>90</sup>	Average weekly pain <i>Single-item</i> Interpersonal stress <i>Custom scale</i>	Positive affect <i>Positive and Negative Affect Schedule – Expanded (PANAS-X)</i>	Negative affect <i>PANAS-X</i>
COVID-19			
Author	Stressor	Moderator	Outcome
Venkatesh et al, 2023 <sup>91</sup>	Pandemic-related stress <i>Single-item</i>	Positive affect <i>Subcomponents of Affect Scale</i>	Depressive symptoms <i>Center for Epidemiologic Studies Depression Scale – Revised (CESD-R)</i>

**Notes:** As in the body of the review, the studies are grouped under headings according to the type of stressor involved. For each study, the key variables (stressors, moderators, and outcomes) are listed, and the measures used to assess these variables (where applicable) are shown in italics. Where established measures have been employed, they are listed by name; otherwise, the type of measure (eg, custom checklist, unnamed scale, single-item) is stated. \*Modified/adapted from original. \*\*Shortened/reduced/abbreviated version.

among those with high satisfaction. In the other study, of 381 Turkish university students, Arslan<sup>77</sup> measured the relationship between recalled ACEs (in the form of psychological maltreatment by parents) and social wellbeing, with trait resilience as a mediator and positive affect as a moderator. The author found a stronger negative association between recalled maltreatment and social wellbeing among those with lower **positive affect**. Interestingly, Arslan also found a stronger negative association between maltreatment and trait resilience among those with higher positive affect, but this might indicate a floor effect, because those with higher positive affect reported greater trait resilience at all levels of maltreatment.

## Adult Experiences of Mistreatment or Trauma

Our search identified only two studies of positive affect as a resilience resource in the context of adult experiences of mistreatment or trauma. Consistent with the ACE studies that suggested a buffering role of positive affect, both studies on adult trauma found significant effects of positive affect-related moderators. In a sample of 81 Aboriginal Australian community adults attending a family counselling service, Gee et al<sup>79</sup> found a moderating effect of resilience resources encompassing both **personal and relational/cultural strengths** (and including a measure of positive affect). Those who had experienced more potentially traumatic events in their lifetimes reported higher levels of posttraumatic stress symptoms, but this association was not significant among those with high levels of strengths. In a study of 425 US female undergraduates who had previously experienced sexual assault, Kumar et al<sup>80</sup> examined the potential buffering roles of **optimism** and **gratitude** (both involving positive affect) in the relationship between posttraumatic stress and suicide risk. Both optimism and gratitude acted as protective factors, where higher levels of either resource predicted a weaker association between

posttraumatic stress symptoms and suicidal ideation. This is consistent with the idea that both optimism and gratitude function to pivot one's focus toward favourable aspects of life, thereby promoting mental health.

## Stressful Life Events or Everyday Stressors

Five studies (across four papers) have examined positive affect as a resilience resource in the context of stressful life events. In a longitudinal study of 126 German university students, Brailovskaia et al<sup>81</sup> found that stressful life events at baseline predicted greater suicidal ideation both at baseline and 24 months later, but these associations were far weaker among those with higher baseline levels of **mental wellbeing** (including positive affect and other aspects of wellbeing). Similarly, in a cross-sectional study of over 1300 US alcohol-dependent patients, Kathryn McHugh et al<sup>83</sup> observed a smaller positive association between perceived stress and negative affect among those with higher **positive affect** (however, although positive affect was negatively correlated with alcohol cravings, it did not moderate the positive association between perceived stress and cravings). Together, these results suggest that positive affect may serve as a resilience resource even in the context of more severe outcomes such as suicidality and more severe stressors such as substance addiction.

However, other research has produced less consistent findings. Riskind et al<sup>84</sup> conducted two studies of resilience resources in relation to positive and negative affect, positive and negative life events, and depression and anxiety symptoms. In the first study, of 99 US undergraduate students, baseline trait negative affect positively predicted depressive symptoms six weeks later in those with low baseline trait positive affect, but not in those with high baseline trait positive affect. However, trait positive affect did not have such an interaction effect on anxiety symptoms. In the second study, of 107 US undergraduates, there was an interaction between number of positive events (in the past year) and number of negative events (in the past year) in predicting depression symptoms (but again, not anxiety) six weeks later. For those who had experienced a low number of positive events, there was a positive association between number of negative events and depression. However, for those who had experienced a high number of positive events, there was a negative association between negative events and depression. Thus, experiencing fewer negative events was seemingly a liability for those who reported a high number of positive events. This counter-intuitive finding warrants further exploration.

Finally, a single study has considered genetic factors in the context of positive affect as a potential moderator of the impact of stressful life events. In a sample of over 13,000 members of the Netherlands Twin Register (including pairs of twins and their biological siblings), de Vries et al<sup>82</sup> investigated the longitudinal association (over periods of up to 10 years) between wellbeing and resilience to negative life events. Resilience was operationalised as the residuals from regressing a measure of anxiety and depression symptoms on a measure of the number of negative events reported by the participants in their lifetimes. Thus, higher resilience scores indicated lower levels of anxiety and depression than would have been expected given the number of reported negative events. After accounting for genetic overlap, the authors found evidence of a causal effect of **life satisfaction** on resilience, with those higher in life satisfaction reporting lower levels of anxiety and depression for a given number of negative events. However, there was also evidence of a causal effect in the opposite direction, whereby resilience positively predicted wellbeing at follow-up.

## Occupational Stressors

Two cross-sectional studies, both conducted in Italy, have examined positive affect as a moderator of the impact of occupational stressors. In one study, of 222 patient-facing healthcare professionals, Maffoni et al<sup>85</sup> found that managerial support (in dealing with ethical issues at work) was negatively correlated with moral distress (and thereby emotional exhaustion) only in those with higher levels of positive affect. This finding suggests that positive affect accentuates the benefits of managerial support, but conversely, it can be interpreted as suggesting that positive affect worsens the distress caused by a lack of managerial support. Clearly, this domain warrants further research. In the other study, of 131 never-employed young adults, Viola et al<sup>86</sup> found that **psychological wellbeing** was negatively associated with lack of career readiness (ie, career indecision and lack of motivation to find employment) more strongly in those with lower levels of hardiness (ie, lower trait resilience). This interaction effect suggests that wellbeing might be a more impactful resource for those with lower trait resilience, at least in some contexts. However, it could also be interpreted in the reverse

direction, with lack of career readiness as the stressor, wellbeing as the outcome, and hardiness as the resilience resource. Again, further research is required.

## Health Conditions (Other Than COVID-19)

Four studies have examined positive affect as a possible protective factor for those with various health conditions. Two of these studies found that positive affect (or related wellbeing measures) significantly moderated the association between depression and suicidality. In a longitudinal study of over 1900 US adolescents, Yu et al<sup>89</sup> classified the participants into three profiles: low levels, mild levels, and moderate-to-high levels of depressive symptoms. Regardless of life satisfaction, those in the low profile had a low risk of suicide, and those in the moderate-to-high profile had a high risk of suicide. But in the mild profile, **life satisfaction** was negatively associated with suicide risk. This suggests that while life satisfaction may serve to mitigate the impact of mild depression, it may not be so effective in the context of more severe depression. However, Yu et al also found that there was a negative association between **optimism** and suicide risk only for the moderate-to-high profile, which suggests that positive affect-related traits (such as optimism) may serve as resilience resources even for those with severe depression. Furthermore, Siegmann et al<sup>87</sup> examined whether moderators of the association between depression and suicidal ideation were the same cross-culturally in large samples of German (601 participants) and Chinese (over 2600 participants) university students. In both populations, the negative association between depression severity and suicidal ideation was weaker for participants who reported higher levels of **mental wellbeing** (including positive emotions). Life satisfaction played a similar buffering role, but only for the German participants.

In addition, two studies have found evidence of the possible protective role of positive affect for adults experiencing chronic physical pain. In one study, of 43 rheumatoid arthritis (RA) patients, Strand et al<sup>88</sup> made weekly measurements of the severity of the participants' most intense RA-related pain. Those with more severe pain reported higher levels of negative affect, but this association was weaker among those with higher **positive affect**. In the other study, of 124 women with fibromyalgia and/or osteoarthritis, Zautra et al<sup>90</sup> measured the participants' average weekly levels of both physical pain (due to their health condition) and perceived interpersonal stress. Both pain and interpersonal stress were positively associated with negative affect, but less so among those with higher positive affect. Together, these studies suggest that positive affect can be an effective resilience resource even in the context of severe physical pain.

## COVID-19

A single study investigated positive affect as a resilience resource in the context of the COVID-19 pandemic. In a longitudinal study of 292 US university students, Venkatesh et al<sup>91</sup> administered five surveys in the period May-December 2020. Higher levels of pandemic-related stress at a given timepoint predicted higher levels of depression symptoms at the next timepoint, but this positive association was weaker among those with greater positive affect at the earlier timepoint. However, this moderation effect was not found when anxiety, physical symptoms, or overall health were the outcomes. Furthermore, although the stress-depression link was stronger among those with lower positive affect, those with higher positive affect tended to report greater depression across almost all levels of stress, suggesting that positive affect was mostly a liability rather than a buffer. Despite this, the authors interpreted the interaction effect as if it revealed a protective effect. At most, this conclusion was warranted only at the highest levels of pandemic-related stress.

## Discussion

### Summary of Review

In the context of resilience, mental health research has examined positive affect either as an outcome of the resilience process or as a resource that enables or promotes this process. In both roles, positive affect has been studied in relation to six broad categories of stressor: ACEs, PTEs in adulthood, general life stress, occupational stress, health-related stressors (except COVID-19), and COVID-19-related stress.

Studies of positive affect as an outcome have suggested that the negative impact of these various stressors can be mitigated by a diverse range of resilience resources. These include internal resources such as personality traits and other

personal attributes, as well as external resources such as interpersonal connections and social factors. Numerous studies (eg, <sup>19,28,36,58,68,74</sup>) have found that those with higher trait resilience experience smaller reductions (or larger rebounds) in positive affect following a stressor. The possible protective roles of several other traits have also been revealed. These traits typically involve a positive attitude toward the future (eg, hope,<sup>38</sup> optimism,<sup>53,64</sup> positive expectancy,<sup>30</sup> reward sensitivity<sup>34</sup>), a positive attitude toward oneself (eg, self-efficacy,<sup>64</sup> self-esteem,<sup>53,64</sup> self-compassion,<sup>33</sup> internal locus of control,<sup>31</sup> perceived control,<sup>24,53</sup> problem-solving coping style,<sup>17</sup> sense of ethnic identity<sup>25</sup>), or the tendency to see positives or meaning in one's life (eg, trait benefit-finding,<sup>61</sup> sense of coherence,<sup>69</sup> meaning-focused coping style,<sup>54</sup> sense of life meaning,<sup>18</sup> belief in a just world<sup>27</sup>). The Big Five personality traits have also been examined as resilience resources, with evidence that Neuroticism exacerbates the negative impact of stressors on positive affect, while the other four traits (especially Conscientiousness and Extraversion) mitigate this impact.<sup>32,47,59</sup> A few studies<sup>41,44,48</sup> have also examined the possible protective role of emotion regulation, finding that those who employ cognitive reappraisal are less negatively affected by adversity.

When we consider the psychological processes by which each of the aforementioned traits may enable resilience, the most plausible mechanisms are usually discernible from the name of the trait itself (or the category of traits to which it belongs). For example, we may readily hypothesise that the future-oriented traits<sup>38,53,64</sup> promote resilience via future-directed thoughts and behaviours. One may be more motivated to overcome adversity if one can envision a positive future awaiting oneself (making the present hardship worth one's while), and one's responses to adversity may be more effective if one is better able to conceive of viable paths linking present actions with future outcomes (see Snyder's Hope Theory<sup>92</sup>). However, when we consider trait resilience specifically, the relevant psychological mechanisms are not immediately evident. This is because the term "trait resilience" is used in disparate ways across the literature. For example, one of the most popular trait measures of resilience – the Connor-Davidson Resilience Scale (CD-RISC)<sup>93</sup> – comprises five dimensions, covering a wide range of characteristics such as personal competence, acceptance of change, relationship security, perceived control, and spiritual attitudes. In contrast, another popular trait measure – the Brief Resilience Scale (BRS)<sup>94</sup> – does not refer to any personal resources at all. Instead, the BRS simply asks the respondent whether or not they tend to recover quickly and easily from hardship (via six essentially synonymous questions). Thus, scales such as the CD-RISC actually measure one or more traits (eg, perceived control) that may serve as resilience resources, whereas scales such as the BRS pose autobiographical questions about the extent to which the respondent typically recovers from adversity, without inquiring about the personal attributes that may promote or impede such recovery. Therefore, we advise the reader that any findings pertaining to trait resilience (in the present review and elsewhere) must be interpreted with reference to the specific measures used. Where multidimensional measures such as the CD-RISC have been used, the reader must speculate as to which of the incorporated traits might have been responsible for any observed resilience (unless sub-analyses of the individual scale dimensions were performed). Where autobiographical measures such as the BRS have been used, the reader is left to wonder whether any differences in resilience were due to genuine differences in (unmeasured) personality traits or instead due to non-personality differences that covary with self-reported recovery from adversity.

Furthermore, even when a unidimensional trait measure has been used (such as the 10-item version of the CD-RISC<sup>95</sup>), the reader is not able to discern any plausible psychological mechanisms without inspecting the individual items comprising the scale. Upon doing so, the reader may discover that many of the items are autobiographical rather than personality-related (at least at face value). For example, in the 10-item CD-RISC, some of the items arguably refer to traits such as self-efficacy (eg, "I see myself as a strong person") or a sense of humour (eg, "I try to see the humorous side of problems"), but many of them refer only to the phenomenon of resilience itself (eg, "I tend to bounce back after illness or hardship", "I can achieve goals despite obstacles", "I am not easily discouraged by failure"). Such items may serve as useful measures of resilience insofar as they correlate strongly with the phenomenon, but they do not shed any light on how the process of resilience unfolds nor the psychological mechanisms that enable it. Indeed, to answer the question of why a given individual tends to bounce back from adversity, it would be both pointless and circular to mention that the individual strongly agrees with the statement "I tend to bounce back from adversity". In short, we caution the reader to be mindful of circular reasoning (ie, "He's resilient because he's high in trait resilience") and to examine the specific scales and items subsumed under the label "trait resilience" in order to interpret the relevant studies accurately.

Shifting from personality characteristics to interpersonal or social factors, a range of resilience resources have been found to be potentially protective of positive affect. These include social support (given and received),<sup>56</sup> having a romantic partner,<sup>62</sup> teacher support (for students),<sup>47</sup> positive peer relations,<sup>40</sup> parent-child communication,<sup>47</sup> sense of community,<sup>15</sup> family meals,<sup>43</sup> outdoor excursions,<sup>46</sup> volunteering,<sup>66</sup> and cross-ethnic friendships.<sup>9</sup> Other relevant moderators include personal characteristics that relate to social factors, such as loneliness (exacerbating stress)<sup>32</sup> and social support-focused coping style (mitigating stress).<sup>54</sup>

As the preceding summary demonstrates, studies of positive affect as a resilience outcome have focused primarily on resilience resources of a personal or interpersonal nature, especially personality traits and various forms of social support or social connection. Aside from these resources, we note that only a single study has examined each of the following moderators of the link between adversity and positive affect: physical exercise,<sup>14</sup> educational attainment,<sup>32</sup> daily routines,<sup>75</sup> vagal suppression,<sup>10</sup> and low heart rate reactivity.<sup>20</sup> In addition, a small number of studies have examined whether a given form of adversity can moderate its own impact (or the impact of other forms of adversity) on positive affect, with mixed findings. There is evidence that the negative effects of one stressor can be compounded by those of another stressor,<sup>15,23,37</sup> but there is also evidence of curvilinear relationships whereby a low or moderate level of adversity (either concurrently or in one's past) can be protective of positive affect, relative to no adversity or high levels of adversity.<sup>35,45,49</sup> The latter findings concur with the literature on stress inoculation and post-traumatic growth,<sup>96,97</sup> reminding us of the formative role that hardship can play in the development of mental health and fortitude.

Although dozens of studies have examined positive affect as an outcome of the resilience process, far fewer studies have treated positive affect as a resilience resource that can mitigate the impact of stressors on other outcomes. Moreover, the latter studies pertain to a relatively narrow range of mental health outcomes, predominantly comprising symptoms related to depression<sup>82,84</sup> or suicide,<sup>80,81,87,89</sup> or other negative outcomes such as anxiety, trauma, or negative affect.<sup>82,83,88,90</sup> Other outcomes, including moral distress,<sup>85</sup> career readiness,<sup>86</sup> social wellbeing,<sup>77</sup> and physical health,<sup>78</sup> have each been addressed by a single study only.

Despite the relative lack of studies on positive affect as a resilience resource, a number of key findings are evident from the literature. In the domain of ACEs, positive affect may mitigate the impact of early life stress on both physical and mental health outcomes.<sup>78</sup> Regarding PTEs in adulthood, positive affect may reduce the risks of posttraumatic stress and suicidality.<sup>79,80</sup> Similarly, in the context of stressful life events, positive affect may be protective against negative affect, depression, anxiety, and suicidal ideation.<sup>81-84</sup> Indeed, when depression itself is the stressor, positive affect may be protective against suicidality.<sup>87,89</sup> Although these key findings are promising, far more research is needed in order to understand the full scope of positive affect as a resilience resource.

## Theoretical Implications

A key theoretical implication of our review is that it reinforces the conception of mental and emotional health as comprising two overlapping but distinct areas of functioning, pertaining to positive emotions and mental wellbeing on the one hand versus negative emotions and mental illness on the other. Where appropriate, we have noted throughout the review those studies which yielded divergent results with regard to positive versus negative constructs (eg, a resilience resource that mitigated a stressor's impact on positive but not negative affect). Such findings corroborate our modern understanding of mental health, often termed the dual-continua model.<sup>98</sup>

Another implication pertains to the nature of moderation effects and how they are interpreted. Without a graph of an interaction effect (or inspection of the corresponding conditional means), the effect cannot be interpreted merely from the associated regression coefficient. For example, a positive coefficient might reveal that the negative association between a stressor and positive affect becomes less negative at higher levels of the resilience resource in question. However, while this seems to indicate that the resource is protective, such a coefficient could instead originate from a floor or ceiling effect. For instance, those with high levels of the supposedly protective resource might have low levels of positive affect across all values of the stressor, in which case the resource would actually confer no advantage at high levels of stress and a disadvantage at low levels of stress. For most of the studies in our review, the authors provided sufficient graphical or numerical summaries for us to determine the exact nature of the interaction effects tested. Where appropriate, we have offered alternative interpretations of results whose authors may have omitted the necessary data or neglected to consider

all explanations of their findings. Overall, we recommend that future scientists not only perform moderation analyses of candidate resilience resources (rather than testing only direct effects or mediations) but also publish all information needed to interpret the analyses accurately (ideally in graphical form).

We raise the issue of moderation analyses not only as a methodological critique but also to highlight some of the interesting findings of our review. In almost every study that yielded a floor or ceiling effect, the purported resilience resource conferred little or no advantage at high levels of adversity and a large advantage at low levels of adversity. In these cases, while there is no evidence that the resource is protective against the stressor in question, the resource can still be considered a net asset, being associated with positive outcomes at least at low levels of the stressor. Such results invite researchers to speculate on the possible causes of the ceiling or floor effect. It may be that the stressor is especially impactful, reducing everyone's wellbeing to a minimal level (at high levels of the stressor) regardless of individual differences in the purported resilience resource. Or it may be that the resource actively compounds the benefits that exist at low levels of adversity (eg, it might accentuate the mental health benefits of relaxation or contentment) while being inert at high levels of adversity. These theoretical questions warrant exploration in future research.

## Gaps and Future Directions

Our literature review has encompassed various studies covering a wide range of stressors, resilience resources, and outcomes. These studies reveal an evidence base with many gaps, but each gap represents not only missing knowledge but also opportunities for future research.

One major gap is evident from the body of this review: Relatively few studies have treated positive affect as a resilience resource. As discussed earlier, it is understandable that many researchers would treat affective states as outcomes of antecedent experiences, but it is also important to remember the motivational role of these states. From an evolutionary perspective, it is obvious that affective states serve to motivate productive behaviours in countless settings, so it is incumbent on resilience researchers not to neglect the possible protective role of positive emotional responses in the context of stress or adversity.

Another major gap pertains to the ways in which positive affect has been measured in the resilience context. As shown in [Table 1 and 2](#), many resilience studies have employed outcome measures that incorporate positive affect but do not measure it as a standalone variable. If we had restricted our analysis only to those studies with a "pure" measure of positive affect, our review would have covered far fewer studies and areas of interest. Future scientists may wish to employ specific measures of positive affect in replications of those studies which did not include such measures originally, to evaluate whether the effect still holds for positive affect when taking into consideration related constructs.

Our review has covered numerous stressors, resources, and outcomes, as well as a wide range of countries, populations, and settings, but this diversity is both a strength and a limitation. Obviously, it is desirable to study positive affect and resilience across varying contexts, but the variability of the literature is also a measure of the lack of replications therein. Direct replications are missing from the literature, and few studies have examined the same populations, stressors, moderators, or outcomes in the same ways. Even where, for example, a resilience resource (such as trait resilience) has been investigated by multiple studies, the studies employ differing measures of the resource or differing measures of the associated outcomes. Again, this is not merely a limitation but also a substantial opening for future inquiry. In addition, there have been relatively few studies that employed experimental or clinical trial designs in the area of positive affect and resilience. This is understandable, given the ethical constraints involved in research on stress and trauma, but there is still scope for innovative experiments and interventions to test resilience resources in more rigorous and realistic ways. Another gap relates to the kinds of stressors examined in the literature to date. Understandably, much of the research has focused on more severe or salient stressors (such as child maltreatment), but we must remember that resilience pertains to not only recovery from adverse events but also adaptation to stressors more broadly, including life challenges that may be demanding but fulfilling (eg, competitive sport). Future resilience researchers may wish to explore the roles of positive affect in the context of such stressors.

A key strength of our review is that it employed a rigorous definition of resilience, whereby resilience resources moderate the impact of a given stressor on a given mental health outcome. We also included all null results of the moderation analyses reported in the included studies, to give the most complete portrayal of the literature possible.

However, we must stress that while a given variable may not have an interactive effect within the resilience process, it may still have an additive effect on the outcome in question. Thus, a given attribute might not serve as a resilience resource (in that it does not mitigate the impact of any stressor) but it might still be worth promoting such attributes because of other benefits they may bring beyond the context of recovery or adaptation. Furthermore, even when a significant interaction effect is present, the reader must exercise caution in interpreting the nature of the effect. We recommend consulting graphical depictions of such interactions, in order to assess whether any ceiling or floor effects may be influencing the interpretation (see our earlier discussion in Theoretical Implications).

Finally, we should note that some authors may be studying the resilience process without always using the terminology of resilience. To take a deliberately extreme example, if an author had studied recovery from adversity, but referred to this process exclusively with the term “amelioration”, then their study would not have been included in our review. This is not a weakness of the review because it would have been beyond the scope of this paper to include all synonyms of resilience. We simply wish to alert the reader to the possibility of alternative conceptualisations, and to recommend that future researchers use the terminology of resilience when studying the process of overcoming adversity or adapting to stressors, in order for their findings not to be overlooked by the mainstream of the field.

## Concluding Remarks

The field of research on resilience and positive affect is relatively young, but the literature has already provided a wide array of studies covering numerous forms of stress and adversity. Most of the studies measured positive affect as an outcome of the resilience process, highlighting various internal and external resources that may be protective of positive affect and mental wellbeing in the face of stressors. Although relatively few studies have treated positive affect as a potential resilience resource, their findings show that positive affect may be protective of mental health following adversity in childhood, adulthood, and everyday life. In all, there are countless opportunities to build upon the knowledge base covered in this review. Numerous stressors, moderators, and outcomes have yet to be examined in the context of positive affect and resilience. Indeed, an inspection of the years of publication of the reviewed papers shows how many were published only in the last few years. Clearly, this field is expanding quickly, which aligns with the broader acceleration of modern psychological research on the positive dimensions of mental health. The potential for new discoveries, and thereby new approaches to helping people recover from or adapt to stress and trauma, seems immense.

## Disclosure

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