

# UC San Diego

## UC San Diego Previously Published Works

### Title

Overview of measurement-based positive psychiatry.

### Permalink

<https://escholarship.org/uc/item/3z29r0j1>

### Journal

Nordic journal of psychiatry, 72(6)

### ISSN

0803-9488

### Authors

Eglit, Graham ML  
Palmer, Barton W  
Jeste, Dilip V

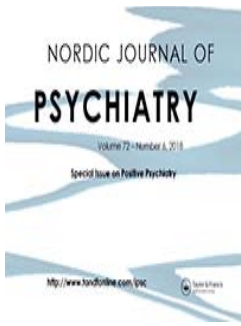
### Publication Date

2018-08-01

### DOI

10.1080/08039488.2018.1459834

Peer reviewed



## Overview of measurement-based positive psychiatry

Graham M. L. Eglit, Barton W. Palmer & Dilip V. Jeste

To cite this article: Graham M. L. Eglit, Barton W. Palmer & Dilip V. Jeste (2018) Overview of measurement-based positive psychiatry, *Nordic Journal of Psychiatry*, 72:6, 396-403, DOI: [10.1080/08039488.2018.1459834](https://doi.org/10.1080/08039488.2018.1459834)

To link to this article: <https://doi.org/10.1080/08039488.2018.1459834>



Published online: 10 Jan 2019.



Submit your article to this journal 



View Crossmark data 

## Overview of measurement-based positive psychiatry

Graham M. L. Eglit<sup>a,b</sup>, Barton W. Palmer<sup>a,b,c</sup> and Dilip V. Jeste<sup>a,b,d</sup>

<sup>a</sup>Department of Psychiatry, University of California San Diego, La Jolla, CA, USA; <sup>b</sup>Sam and Rose Stein Institute for Research on Aging, University of California San Diego, La Jolla, CA, USA; <sup>c</sup>Veterans Affairs San Diego Healthcare System, San Diego, CA, USA; <sup>d</sup>Department of Neurosciences, University of California San Diego, La Jolla, CA, USA

### ABSTRACT

**Background:** Psychiatry has traditionally focused on studying psychopathology and treating mental illnesses to relieve symptoms and prevent relapse. Positive psychiatry seeks to expand the scope of psychiatry to broader aspects of mental health and well-being among individuals with or without mental illnesses. Positive psychosocial factors such as well-being, resilience, optimism, wisdom, and social support are central to positive psychiatry.

**Aim:** To summarize the emerging science of positive psychiatry, emphasizing the use of measures of positive characteristics and outcomes relevant to mental health.

**Methods:** Overview of recent research in positive psychiatry, focusing on measurements.

**Results:** Positive psychosocial factors are associated with better mental and physical health in diverse populations. Among individuals with serious mental illnesses, levels of these factors vary considerably, but positive psychiatry interventions can improve well-being and rates of recovery in at least subsets of the patients. A number of measures of positive factors and outcomes are available; most of them are based on self-reports, which have advantages as well as limitations.

**Conclusions:** Positive psychiatry has the potential to improve the health and well-being of individuals with or without mental illnesses. Further research is needed to provide clinicians and investigators with a full tool-box of validated measures for positive psychosocial factors and outcomes. These measures should be subjected to rigorous psychometric evaluation across populations to help clarify mechanisms underlying positive factors, evaluate their longitudinal trajectories, and examine the impact of interventions on health and well-being over the lifespan in different clinical groups.

### ARTICLE HISTORY

Received 7 March 2018

Accepted 27 March 2018

### KEYWORDS

Well-being; mental health; psychometrics; psychological resilience; optimism; wisdom; social engagement; depression

### Introduction

Psychiatry has been traditionally defined as a branch of medicine dedicated to the study and treatment of mental illnesses [1]. Positive psychiatry seeks to broaden the focus to mental health in people with or without mental illnesses. A key requirement for any health-related field is that clinicians and researchers be equipped with psychometrically valid measures that can be used in a wide array of applied settings [2]. Not surprisingly, the most commonly employed measures in psychiatric practice and research involve quantification of symptoms of mental illnesses such as depression, anxiety, and psychosis. While these pursuits have advanced our understanding and treatment of psychiatric disorders, broader aspects of mental health and well-being have been largely overlooked.

In this article, we provide an overview of positive psychiatry followed by a summary of measures for positive outcomes and positive psychosocial factors. Next we discuss the needs and opportunities for overall research in positive psychiatry and then specifically for measurement-focused research in this arena.

### Overview of positive psychiatry

#### Definition

Positive psychiatry is the science and practice of psychiatry, which aims to understand and promote well-being through the enhancement of positive psychosocial factors (e.g. resilience, optimism, wisdom, environmental support) that contribute to mental and physical health [1]. Positive psychiatry does not replace or compete with traditional psychiatry; rather, it complements traditional psychiatry by providing a more expansive understanding of mental wellness and opening up additional avenues for intervention. In the context of psychopharmacologic treatments, Bech has described a pharmacometric triangle, with one corner representing measures at symptom levels, a second corner representing assessment of medication side-effects, and a third one representing measurement of quality of life [3], with all three components receiving equal weight (an equilateral triangle).

#### Biology

As a branch of medicine, positive psychiatry seeks to elucidate biological underpinnings of positive psychological

factors and outcomes. For example, individuals with low levels of resilience have been found to exhibit heightened activation in anterior insula in response to both aversive and neutral stimuli while individuals with high resilience exhibit heightened activation in anterior insula in response to aversive but not neutral stimuli, suggesting that resilient individuals appropriately marshal emotional resources to meet situational demands [4]. Optimism has been shown to involve increased activation in rostral anterior cingulate cortex and amygdala, and diminished activation in fusiform gyrus and frontal regions [5]. Putative neurocircuitry of wisdom, which has several components including empathy and compassion, involves the prefrontal cortex (especially ventromedial and dorsolateral), anterior cingulate, and limbic striatum [6,7].

### **Positive psychiatry and mental or physical illnesses**

Positive psychiatry in serious mental illnesses (SMI) may sound oxymoronic. Yet, several recent studies have highlighted the previously under-recognized presence of positive psychosocial factors and outcomes in people with SMI. Relatively high levels of resilience, spirituality, and empathy were reported among individuals with bipolar disorder [8]. Individuals with first-episode psychosis were found to have levels of happiness and life satisfaction comparable to those in non-psychiatric individuals [9]. Studies have reported a wide range of levels (from very low to high) of happiness and life satisfaction in patients with chronic schizophrenia [10,11]. Higher levels of happiness and life satisfaction in people with schizophrenia were associated with greater optimism and personal mastery along with lower levels of perceived stress, depression, and amotivation [10,11]. Notably, these positive characteristics were also associated with healthier levels of biomarkers of inflammation and insulin resistance [12].

Among individuals with physical illnesses, resilience is associated with enhanced engagement in healthy behaviors related to self-care, treatment adherence, and exercise [13], and greater longevity [14]. HIV-infected individuals reported similar levels of ambition (but lower grit) as HIV-negative individuals. Greater ambition was associated with better global neurocognitive functioning, and higher grit with greater independence in daily functioning among HIV-infected individuals [15]. Older cancer survivors, despite worse physical health and more stressful life events, reported levels of life satisfaction comparable to healthy older adults [16]. Higher levels of optimism are associated with better outcomes related to cardiovascular health, cancer, pregnancy, pain, and longevity, due, in part, to better immune function [17] as well as greater engagement in physical activities and healthier dietary patterns [18]. Similarly, social engagement is associated with reduced risk of cardiovascular disease, healthier levels of biomarkers of immune function and inflammation [19,20], and greater longevity [21]. Higher levels of social support are associated with lower prevalence and severity of depression, anxiety, substance use disorders, hypertension, and cardiovascular disease, and greater longevity [22].

Therefore, positive psychosocial factors may serve as useful intervention targets to improve well-being and health among individuals with mental or physical illnesses.

### **Positive psychiatry interventions**

In recent years, several studies of interventions aiming to promote health and well-being in individuals with mental illnesses have reported promising findings [23]. A group positive psychotherapy intervention in individuals with schizophrenia that included exercises to pursue a meaningful goal, reflection on own strengths, daily savoring of positive experiences, and brief mindfulness meditation, improved well-being, hope, savoring, self-esteem, and level of psychopathology after treatment and three months later [24]. A manualized intervention for schizophrenia, labeled cognitive behavioral social skills training (CBSST), aimed at challenging thoughts and misinterpretations of experiences to facilitate pursuit of patient-identified personally meaningful goals [25,26]. It improved cognitive insight, objectivity in reappraisal of psychotic symptoms, self-esteem, and life satisfaction, and reduced amotivation, anxiety, and depression [25,26]. There are also several reports of interventions targeting resilience, stress reduction, and compassion in people with or without mental illnesses [27–29]. In a randomized controlled trial (RCT) in patients with binge eating disorder, a 3-week self-compassion training and food planning intervention significantly improved self-compassion and eating disorder pathology compared to two control conditions [30]. A small study with a cross-over design reported that life review therapy, using structured questionnaires, in older veterans with PTSD, significantly increased self-assessed wisdom and decreased depressive symptoms [31].

It should be stressed that the intervention literature in positive psychiatry is limited and in need of additional research.

### **Measures of positive psychiatry outcomes**

Relevant outcomes in positive psychiatry and commonly used quantitative measurement tools are considered below [1].

#### **Well-being**

A widely employed measure of physical and mental well-being is the Medical Outcomes Study – Short Form 36 (MOS-SF-36) Health Survey [32]. Bech et al. [33] have validated a 10-item version of World Health Organization European Regional Office (WHO/EURO) scale of Well-being, covering both negative (e.g. 'I feel downhearted and blue') and positive (e.g. 'I feel energetic, active or vigorous') aspects. A more recent version of the WHO scale is WHO-5 [34]. All of these are measures of hedonic well-being [35].

### **Flourishing**

Flourishing is closely related to the concept of eudemonic well-being, and entails a broader understanding of what is involved in doing or being well [35]. At a minimum, flourishing involves the following five broad domains: (1) happiness and life satisfaction; (2) health, both mental and physical; (3) meaning and purpose; (4) character and virtue; and (5) close social relationships. Vanderweele proposed two brief, summary measures of flourishing [36].

### **Low level of perceived stress**

Perceived stress refers to the extent to which an individual perceives that current demands or challenges exceed his/her ability to cope with them. An individual's perception of stress is a stronger predictor of health-related outcomes than the objective demands of a situation [37]. The 10-item Perceived Stress Scale [38], a modification of the original 14-item scale [37], is a widely used measure of this construct, which consists of two factors: level of perceived stress and coping ability/resilience [39,40].

### **Successful psychosocial aging**

While traditional conceptualizations of successful aging have highlighted an absence of physical disease and disability [41], older adults themselves tend to emphasize subjective psychosocial aspects of aging. These include adapting to losses and limitations [42], maintaining social contacts [43], developing a realistic self-appraisal, and fostering self-growth [44]. Subjective successful aging has been assessed with a single item: 'How do you rate yourself on successful aging on a scale from 1 (the worst) to 10 (the best)?' [45–47].

### **Post-traumatic growth**

Severely stressful events, including life-threatening traumas and illnesses, can lead to development of post-traumatic stress disorder (PTSD). However, a sizable minority of survivors experiences positive outcomes [48–50], referred to as posttraumatic growth [51]. A commonly used measure of this construct is the 21-item Posttraumatic Growth Inventory, which assesses five components: new possibilities, relating to others, personal strength, spiritual change, and appreciation of life [52].

### **Recovery in serious mental illnesses**

Contrary to traditional conceptualizations of SMI as involving inevitably progressive functional declines, outcomes are heterogeneous, with a sizable proportion of individuals exhibiting psychological improvement in older years [53]. Definitions of recovery vary, but typically include an absence or a marked reduction of symptoms along with functional independence and higher subjective well-being [54]. This concept highlights the potential for individuals with SMI to lead meaningful, fulfilling lives with dignity and happiness [10]. Currently, there is

no single widely used measure that covers all of the relevant aspects of this broad but somewhat context-dependent construct.

### **Measures of positive psychosocial factors**

Positive psychosocial factors constitute the main mechanisms that lead to the above-mentioned positive outcomes. The respective measures are discussed below.

#### **Resilience**

Resilience is the ability to recover from or adapt successfully to illness, stress, or other adverse events [55]. It is facilitated by positive-emotion-eliciting coping strategies such as positive reappraisal of adverse events [56], goal-directed problem-focused coping [57], and discovery of positive meaning [58]. A commonly used measure of resilience is the 25-item Connor-Davidson Resilience Scale [59] or its 10-item version [60]. Other measures include the Grit Scale [61], the Child and Youth Resilience Measure [62], and the Multidimensional Individual and Interpersonal Resilience Measure [63].

#### **Optimism**

Optimism refers to the dispositional tendency to expect good rather than bad outcomes [64]. Optimism plays a significant role in motivation and in response to stress and adversity [64]. Commonly administered measures of optimism include the Life Orientation Test – Revised [65], the Youth Life Orientation Test [66], and the Optimism-Pessimism Scale [67].

#### **Personal mastery and coping self-efficacy**

Personal mastery is defined as the extent to which a person believes that s/he has control over forces and events that influence that individual's life, and the personal expectations of being able to achieve desired outcomes [1,68]. It is an important protective factor against adverse effects of stress and illness [69]. The related concept of coping self-efficacy denotes one's appraised capability to respond to challenging, demanding, or threatening situations or events through use of specific coping strategies [70]. Personal mastery is commonly measured using the Personal Mastery Scale [71], and self-efficacy with the Self-Efficacy Scale [72] and the Coping Self-Efficacy Scale [73].

#### **Social engagement**

Social engagement refers to the quality and quantity of one's social network; key aspects include frequency of social contact, intimacy or closeness experienced in these social contacts, and pleasure derived from social interactions. Social engagement is measured with Patient-Reported Outcomes Measurement Information System (PROMIS) Satisfaction with Participation in Discretionary Social Activities scale [74].

### **Spirituality and religiosity**

Spirituality may be described as the manner in which one's beliefs, attitudes, and behaviors reflect a focus on transcendent topics such as belief in a higher power, meaning of life, and level of consciousness. Religiosity refers to an individual's participation in organized religious practices, and is thus more of a social phenomenon than the more internalized construct of spirituality. Relevant measures include the Brief Multidimensional Measure of Religiousness/Spirituality [75], the Daily Spiritual Experiences Scale [76], and the Ironson-Woods Spirituality/Religiousness Index [77].

### **Wisdom**

Wisdom may be defined as a complex trait comprised of several specific components: social decision making, prosocial behaviors such as empathy and compassion, self-reflection, emotional regulation, acknowledgement of uncertainty, tolerance of diverse value systems, decisiveness, and sometimes, spirituality [5]. Wisdom can be measured using the Three Dimensional Wisdom Scale [78], or its 12-item short-version [79], the Self-Assessed Wisdom Scale [80], or our most recently published San Diego Wisdom Scale (SD-WISE) which includes the above-mentioned content domains based on a putative neurobiological model of wisdom [81].

### **Positive environmental factors**

Positive environmental factors also promote health and well-being. The most prominent factors are family dynamics and social support.

### **Family dynamics**

This refers to the nature of interpersonal relationships among family members, including mutual expectations, and individual cognitions, emotions, and behaviors [82]. Family context characterized by greater levels of conflict and aggression, and cold, unsupportive, and neglectful relationships, are disruptive to psychosocial functioning, stress-response regulation, and increase the risk for poor health behaviors such as alcohol abuse [83]. Family dynamics can be measured with the Family Adaptability and Cohesion Evaluation Scale [84], the Family Assessment Measure [85], and the Family Dynamics Measure II [86].

### **Social support**

Social support involves the extent to which other people are available for emotional and physical support. Measures include the Multidimensional Scale of Perceived Social Support [87], the 35-item Duke Social Support Index [88] and its abbreviated 11-item version [89].

### **Needs and opportunities for overall research in positive psychiatry**

1. In the few published studies on SMI, only selected positive factors (listed above) have been evaluated [8–12].

Exploration of a full range of positive personality (e.g. creativity, courage, perseverance) and environmental (e.g. cultural ageism and other biases, societal wisdom) characteristics is needed to help increase the potential for use of positive psychiatry across a wider set of clinical populations and situations.

2. Additional investigation is warranted to elucidate the precise bio-psycho-social mechanisms underlying positive psychosocial factors and their relationships to specific psychopathology. For instance, optimism reflects a tendency to expect positive outcomes, which may influence motivation and goal pursuit [64]. Motivational deficits are central to several psychiatric disorders including depression and schizophrenia, although the mechanisms underlying these deficits are complex and may vary across conditions [90]. It is unclear to what extent mechanisms underlying optimism and motivation overlap and impact each other in these disorders.
3. Most of the published research in positive psychiatry has been cross-sectional. Given the availability of excellent national databases in countries such as the Scandinavian countries, the UK, and Canada, longitudinal investigations of clinical samples may be undertaken to examine possible causal impact of positive psychosocial factors on long-term health outcomes.
4. In view of the promising findings of some intervention studies, additional research on positive psychiatry interventions is warranted. One aspect of this research should focus on matching patients to intervention type, based on the patients' psychological strengths – i.e. personalized (or precision) positive psychiatry.

### **Needs and opportunities for measurement-focused research in positive psychiatry**

Use of validated measures for positive psychosocial factors and outcomes is critical for moving positive psychiatry from the lab into the clinic. There is a great need and room for further development of a full toolbox of validated quantitative measures for use in research and clinical applications of positive psychiatry. Below we discuss specific areas of emphasis.

1. *Subjective measures:* The existing measures in positive psychiatry are mostly subjective. Self-rated measures are frequently criticized as being biased. Social desirability bias, which posits that participants rate themselves more positively to present a favorable self-image, has two potential sources: conscious manipulation of one's image and subconscious belief in a positive self-image. Taylor et al. report that the problematic part of social desirability bias arises from conscious image management rather than from self-deception [91]. In the study of SD-WISE, an image management measure did not correlate with three self-reported wisdom measures, supporting their validity [81]. Also, a large study using a published measure of social desirability found no significant association between social desirability and self-reported well-being [92]. A number of self-report

measures have been found to be valuable. Notably, quality of life is subjective by definition [93]. Similarly, self-rated general health is a significant predictor of morbidity and mortality [94]. An investigation involving 1.3 million Americans found a highly significant correlation ( $r=0.6$ ,  $p<.001$ ) between subjective well-being of residents of different communities (based on census report) and objective measures of wellness of the same communities (including cost of living, wages, employment rates, crime rates, etc.) [95]. Thus, the utility of self-rated measures should not be underestimated.

Nonetheless, measurement of subjective constructs must be guided by a strong theory and application of cutting-edge scale development and validation methodology. Fortunately, several scales for assessing traits such as wisdom meet these criteria [81]. For example, the SD-WISE used contemporary item-response and other scale development methods, with the content being based on a comprehensive literature review, expert consensus, and a neurobiological model of the components of wisdom. Empirical validation of the SD-WISE indicated strong psychometric properties, including high convergent and discriminant validity, as well as it having a brief administration time [81].

Thus, self-report measures have an important place in positive psychiatry, but their validity should be demonstrated in various population groups.

2. *Objective measures:* Development of objective measures of positive psychosocial characteristics and outcomes could enhance the precision and validity of the measurement of these constructs, potentially helping facilitate the discovery of underlying neurobiological mechanisms. However, there are few well-validated objective measures of positive factors and outcomes at the present time, as many of these are inherently subjective constructs. Creativity is needed in developing appropriate objective measures in positive psychiatry.

A possible model for objective evaluation in the field is a measure of everyday functioning – an outcome about which patients, family, and clinicians care deeply about. The traditional measures of everyday functioning are based on self-reports and/or reports from clinicians or collateral informants, but such methods are inherently subjective, being affected by the knowledge, insight, and objectivity of the respondent [96]. Investigators have developed objective measures of functional capacity wherein the subject is given a standardized functionally relevant task that can be administered in clinics or research laboratories. For example, the UCSD Performance-based Skills Assessment (UPSA) includes direct assessment of capacity to perform tasks of household chores, finance, communication, transportation, and planning recreational activities [97]. Through subsequent factor analyses, the UC San Diego investigators subsequently developed a brief two-domain (communication and finance) version (UPSA-B) that can be administered in 10–15 minutes [98], and has been widely used, including being translated and adapted into European, Spanish, Swedish, and Japanese versions, as well as a

computerized/mobile version (UPSA-m) that can be administered through a mobile iPad rather than requiring the physical props and examiner materials from the original measure [15,96,99].

3. *Multimodal assessments:* Given the limitations of both subjective and objective measures, a combination of the two would be optimal. Cloninger et al. have suggested integrating psychometric and neurobiological data to understand personality traits [100–102]. An interesting study of this type was a RCT of empathy- and compassion-training in young adult women. It included both clinical (rating scales) and neurobiological (fMRI socio-affective video task to analyze the effects on activation of relevant brain regions) outcomes. The training intervention significantly increased empathy and compassion on validated rating scales. Additionally, it enhanced brain activation in anterior insula and anterior midcingulate cortex, regions associated with empathy regarding pain, as well as in ventral striatum, anterior cingulate, and medial orbitofrontal cortex – regions identified in a putative wisdom neurocircuit [28].
4. *Pragmatic/user-friendly assessment:* To facilitate wider-use of measures of positive psychiatric constructs, further developments are also warranted in terms of practical application. For example, continuous long-term observation of a person's behavior would seem desirable for assessing the levels of her/his psychosocial characteristics. However, there are practical and ethical issues involved in recording people's behavior in this manner. A useful strategy may be use of techniques such as ecological momentary assessment (EMA) and burst design, using smart phones and other technology [103,104]. These methods allow researchers to obtain multiple assessments at randomly selected intervals over a period of time, enabling more valid measures than the traditional single-time assessments at long intervals, while reducing a need for prolonged continued observation.

Another example of increasing the pragmatic usability of measures is the application of computerized adaptive testing. With computerized adaptive testing, a bank of items is created, and based on validated algorithms, only a subset of the most informative items for each respondent are selected – the computer 'adapts' the presentation in accord with the subject's responses to earlier items. This results in both a briefer administration time and a focus on the items that are most appropriate to discerning an individual's level on a particular construct [105]. This approach, grounded in contemporary item response methods, was successfully applied in the development of NIH Patient Reported Outcomes Measurement Information System (PROMIS) [106,107], and warrants exploration for measurements in positive psychiatry.

## Conclusions

Positive psychiatry expands the scope of traditional psychiatry by broadening the focus to enhancing individuals'

positive psychosocial characteristics as a means to promote their recovery, well-being, and growth. These positive factors have historically been under-recognized among individuals with or at-risk for mental illnesses. As such, they represent promising areas to advance current understanding of mental health and wellness and to target therapeutically. A key to such advances and applications to clinical practice will be development of psychometrically strong measures of positive psychosocial factors and outcomes.

## Disclosure statement

The authors declare that there is no conflict of interest.

## Funding

This work was supported by National Institute of Mental Health, [5R01MH094151-04;MH019934].

## References

- [1] Jeste DV, Palmer BW, Rettew DC, et al. Positive psychiatry: its time has come. *J Clin Psychiatry*. 2015;76:675–683.
- [2] Bech P. *Measurement-based care in mental disorders*. Switzerland: Springer; 2016.
- [3] Bech P. Applied psychometrics in clinical psychiatry: the pharmacopsychometric triangle. *Acta Psychiatr Scand*. 2009;120:400–409.
- [4] Feder A, Nestler EJ, Charney DS. Psychobiology and molecular genetics of resilience. *Nat Rev Neurosci*. 2009;10:446–457.
- [5] Bangen KJ, Meeks TW, Jeste DV. Defining and assessing wisdom: a review of the literature. *Am J Geriatr Psychiatry*. 2013;21:1254–1266.
- [6] Meeks TW, Jeste DV. Neurobiology of wisdom: a literature overview. *Arch Gen Psychiatry*. 2009;66:355–365.
- [7] Rankin KP, Gorno-Tempini ML, Allison SC, et al. Structural anatomy of empathy in neurodegenerative disease. *Brain*. 2006;129:2945–2956.
- [8] Galvez JF, Thommi S, Ghaemi SN. Positive aspects of mental illness: a review in bipolar disorder. *J Affect Disord*. 2011;128:185–190.
- [9] Agid O, McDonald K, Siu C, et al. Happiness in first-episode schizophrenia. *Schizophr Res*. 2012;141:98–103.
- [10] Palmer BW, Martin AS, Depp CA, et al. Wellness within illness: happiness in schizophrenia. *Schizophr Res*. 2014;159:151–156.
- [11] Fervaha G, Agid O, Takeuchi H, et al. Life satisfaction and happiness among young adults with schizophrenia. *Psychiatry Res*. 2016;242:174–179.
- [12] Edmonds EC, Martin AS, Palmer BW, et al. Positive mental health in schizophrenia and healthy comparison groups: relationships with overall health and biomarkers. *Aging Ment Health*. 2018;22:354–362.
- [13] Stewart DE, Yuen T. A systematic review of resilience in the physically ill. *Psychosomatics*. 2011;52:199–209.
- [14] Zeng Y, Shen K. Resilience significantly contributes to exceptional longevity. *Curr Gerontol Geriatr Res*. 2010;2010:1–9.
- [15] Moore RC, Fazeli PL, Patterson TL, et al. UPSA-M: feasibility and initial validity of a mobile application of the UCSD Performance-Based Skills Assessment. *Schizophr Res*. 2015;164:187–192.
- [16] Zlatar ZZ, Meier EA, Montross Thomas LP, et al. Life satisfaction and its correlates among older cancer survivors: critical role of psychosocial factors. *Psychooncology*. 2015;24:241–244.
- [17] Rasmussen HN, Scheier MF, Greenhouse JB. Optimism and physical health: a meta-analytic review. *Ann Behav Med*. 2009;37:239–256.
- [18] Giltay EJ, Geleijnse JM, Zitman FG, et al. Lifestyle and dietary correlates of dispositional optimism in men: the Zutphen Elderly study. *J Adult Dev*. 2007;63:483–490.
- [19] Everson-Rose SA, Lewis TT. Psychosocial factors and cardiovascular diseases. *Annu Rev Public Health*. 2005;26:469–500.
- [20] Kiecolt-Glaser JK, McGuire L, Robles TE, et al. Emotions, morbidity, and mortality: new perspectives from psychoneuroimmunology. *Annu Rev Psychol*. 2002;53:83–107.
- [21] Holt-Lunstad J, Smith TB, Layton JB. Social relationships and mortality risk: a meta-analytic review. *PLoS Med*. 2010;7:1–20.
- [22] Uchino BN. Social support and health: a review of physiological processes potentially underlying links to disease outcomes. *J Behav Med*. 2006;29:330–366.
- [23] Jeste DV, Palmer BW. *Positive psychiatry: a clinical handbook*. Arlington (VA): American Psychiatric Association; 2015.
- [24] Meyer PS, Johnson DP, Parks A, et al. Positive living: a pilot study of group positive psychotherapy for people with schizophrenia. *J Positive Psychol*. 2012;7:239–248.
- [25] Granholm E, Holden J, Link PC, et al. Randomized controlled trial of cognitive behavioral social skills training for older consumers with schizophrenia: defeatist performance attitudes and functional outcome. *Am J Geriatr Psychiatry*. 2013;21:251–262.
- [26] Granholm E, McQuaid JR, McClure FS, et al. Randomized controlled trial of cognitive behavioral social skills training for older people with schizophrenia: 12-month follow-up. *J Clin Psychiatry*. 2007;68:730–737.
- [27] Creswell JD, Irwin MR, Burklund LJ, et al. Mindfulness-based stress reduction training reduces loneliness and pro-inflammatory gene expression in older adults: a small randomized controlled trial. *Brain Behav Immun*. 2012;26:1095–1101.
- [28] Klimecki OM, Leiberg S, Lamm C, et al. Functional neural plasticity and associated changes in positive affect after compassion training. *Cereb Cortex*. 2012;23:1552–1561.
- [29] Adler AB, Williams J, McGurk D, et al. Resilience training with soldiers during basic combat training: randomisation by platoon. *Applied Psychol: Health Well Being*. 2015;7:85–107.
- [30] Kelly AC, Carter JC. Self-compassion training for binge eating disorder: a pilot randomized controlled trial. *Psychol Psychother*. 2015;88:285–303.
- [31] Daniels LR, Boehnlein J, McCallion P. Aging, depression, and wisdom: a pilot study of life-review intervention and PTSD treatment with two groups of Vietnam Veterans. *J Gerontol Soc Work*. 2015;58:420–436.
- [32] Brazier JE, Harper R, Jones NMB, et al. Validating the SF-36 Health Survey questionnaire: new outcome measure for primary care. *BMJ*. 1992;305:160–164.
- [33] Bech P, Gudex C, Johansen KS. The WHO (Ten) Well-Being Index: validation in diabetes. *Psychother Psychosom*. 1996;65:183–190.
- [34] Bonsignore M, Barkow K, Jessen F, et al. Validity of the five-item WHO well-being index (WHO-5) in an elderly population. *Eur Arch Psychiatry Clin Neurosci*. 2001;251:27–31.
- [35] Ryan RM, Deci EL. On happiness and human potentials: a review of research on hedonic and eudaimonic well-being. *Annu Rev Psychol*. 2001;52:141–166.
- [36] VanderWeele TJ. On the promotion of human flourishing. *Proc Natl Acad Sci USA*. 2017;114:8148–8156.
- [37] Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. *J Health Soc Behav*. 1983;24:385–396.
- [38] Cohen S, Williamson GM. Perceived stress in a probability sample of the United States. In: Spacapan S, Oskamp S, editors. *The social psychology of health*. Newbury Park (CA): Sage; 1988. p. 31–67.
- [39] Golden-Kreutz DM, Browne MW, Frierson GM, et al. Assessing stress in cancer patients: a second-order factor analysis model for the Perceived Stress Scale. *Assessment*. 2004;11:216–223.
- [40] Nielsen MG, Ornbol E, Vestergaard M, et al. The construct validity of the Perceived Stress Scale. *J Psychosom Res*. 2016;84:22–30.



- [41] Rowe JW, Kahn RL. Human aging: usual and successful. *Science*. 1987;10:143–149.
- [42] Knight T, Ricciardelli LA. Successful aging: perceptions of adults aged between 70 and 101 years. *Int J Aging Hum Dev*. 2003; 56:223–245.
- [43] von Faber M, Bootsma-van der Wiel A, van Exel E, et al. Successful aging in the oldest old: who can be characterized as successfully aged? *Arch Intern Med*. 2001;161:2694–2700.
- [44] Reichstadt J, Depp CA, Palinkas LA, et al. Building blocks of successful aging: a focus group study of older adults' perceived contributors to successful aging. *Am J Geriatr Psychiatry*. 2007; 15:194–201.
- [45] Montross LP, Depp CA, Daly J, et al. Correlates of self-rated successful aging among community-dwelling older adults. *Am J Geriatr Psychiatry*. 2006;14:43–51.
- [46] Strawbridge WJ, Wallhagen MI, Cohen RD. Successful aging and well-being: self-rated compared with Rowe and Kahn. *Gerontologist*. 2002;42:727–733.
- [47] Jeste DV, Savla GN, Thompson WK, et al. Association between older age and more successful aging: critical role of resilience and depression. *Am J Psychiatry*. 2013;170:188–196.
- [48] Schubert CF, Schmidt U, Rosner R. Posttraumatic growth in populations with posttraumatic stress disorder—a systematic review on growth-related psychological constructs and biological variables. *Clin Psychol Psychother*. 2016;23:469–486.
- [49] Kolokotroni P, Anagnostopoulos F, Tsikkinis A. Psychosocial factors related to posttraumatic growth in breast cancer survivors: a review. *Women Health*. 2014;54:569–592.
- [50] Zoellner T, Maercker A. Posttraumatic growth in clinical psychology – a critical review and introduction of a two component model. *Clin Psychol Rev*. 2006;26:626–653.
- [51] Tedeschi RG, Calhoun LG. Target article: “Posttraumatic growth: conceptual foundations and empirical evidence”. *Psychol Inquiry*. 2004;15:1–18.
- [52] Tedeschi RG, Calhoun LG. The Posttraumatic Growth Inventory: measuring the positive legacy of trauma. *J Traum Stress*. 1996; 9:455–471.
- [53] Jeste DV, Wolkowitz OM, Palmer BW. Divergent trajectories of physical, cognitive, and psychosocial aging in schizophrenia. *Schizophr Bull*. 2011;37:451–455.
- [54] Davidson L, Borg M, Marin I, et al. Processes of recovery in serious mental illnesses: findings from a multinational study. *Am J Psychiatr Rehabil*. 2005;8:177–201.
- [55] Ong AD, Bergeman CS, Bisconti TL, et al. Psychological resilience, positive emotions, and successful adaptation to stress in later life. *Personal Process Individ Differ*. 2006;91:730–749.
- [56] Affleck G, Tennen H. Construing benefits from adversity: adaptation significance and dispositional underpinnings. *J Personal*. 1996;64:899–922.
- [57] Billings DW, Folkman S, Acree M, et al. Coping and physical health during caregiving: the roles of positive and negative affect. *J Pers Soc Psychol*. 2000;79:131–142.
- [58] Ong AD, Bergeman CS, Bisconti TL. The role of daily positive emotions during conjugal bereavement. *J Gerontol B: Psychol Sci Soc Sci*. 2004;59:168–176.
- [59] Connor KM, Davidson JR. Development of a new resilience scale: the Connor-Davidson Resilience Scale (CD-RISC). *Depress Anxiety*. 2003;18:76–82.
- [60] Campbell-Sills L, Stein MB. Psychometric analysis and refinement of the Connor-Davidson Resilience Scale (CD-RISC): validation of a 10-item measure of resilience. *J Traum Stress*. 2007;20:1019–1028.
- [61] Duckworth AL, Peterson C, Matthews MD, et al. Grit: perseverance and passion for long-term goals. *J Personal Soc Psychol*. 2007;9:1087–1101.
- [62] Ungar M, Liebenberg L. Assessing resilience across cultures using mixed methods: construction of the Child and Youth Resilience Scale. *J Mixed Methods Res*. 2011;5:126–149.
- [63] Martin AS, Distelberg B, Palmer BW, et al. Development of a new multidimensional individual and interpersonal resilience measure for older adults. *Aging Ment Health*. 2015;19:32–45.
- [64] Carver CS, Scheier MF, Segerstrom SC. Optimism. *Clin Psychol Rev*. 2010;30:879–889.
- [65] Scheier MF, Carver CS, Bridges MW. Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): a reevaluation of the Life Orientation Test. *J Pers Soc Psychol*. 1994;67:1063–1078.
- [66] Ey S, Hadley W, Allen DN, et al. A new measure of children's optimism and pessimism: the Youth Life Orientation Test. *J Child Psychol Psychiatry*. 2004;46:548–558.
- [67] Dember WN, Martin SH, Hummer MK, et al. The measurement of optimism and pessimism. *Curr Psychol: Res Rev*. 1989;8:102–109.
- [68] Spencer SM, Patrick JH. Social support and personal mastery as protective resources during emerging adulthood. *J Adult Dev*. 2009;16:191–198.
- [69] Mausbach BT, Patterson TL, Von Kanel R, et al. The attenuating effect of personal mastery on the relations between stress and Alzheimer caregiver health: a five-year longitudinal analysis. *Aging Ment Health*. 2007;11:637–644.
- [70] Benight CC, Harper ML. Coping self-efficacy perceptions as a mediator between acute stress response and long-term distress following natural disasters. *J Traum Stress*. 2002;15:177–186.
- [71] Pearlin LI, Schooler C. The structure of coping. *J Health Soc Behav*. 1978;19:2–21.
- [72] Sherer M, Maddux JE, Mercandante B, et al. The self-efficacy scale: construction and validation. *Psychol Rep*. 1982;51:663–671.
- [73] Chesney MA, Neilands TB, Chambers DB, et al. A validity and reliability study of the coping self-efficacy scale. *Br J Health Psychol*. 2006;11:421–437.
- [74] Hahn EA, Beaumont JL, Pilkonis PA, et al. The PROMIS satisfaction with social participation measures demonstrated responsiveness in diverse clinical populations. *J Clin Epidemiol*. 2016; 73:135–141.
- [75] Institute F. Multidimensional measurement of religiousness/spirituality for use in health research: a report of the Feltzer Institute/National Institute on Aging Working Group; 1999.
- [76] Underwood LG, Teresi JA. The Daily Spiritual Experiences Scale: development, theoretical description, reliability, exploratory factor analysis, and preliminary construct validity using health-related data. *Ann Behav Med*. 2002;24:22–33.
- [77] Ironson G, Solomon GF, Balbin EG, et al. The Ironson-Woods Spirituality/Religiousness Index is associated with long survival, health behaviors, less distress, and low cortisol in people with HIV/AIDS. *Ann Behav Med*. 2002;24:34–48.
- [78] Ardel M. Empirical assessment of a three-dimensional wisdom scale. *Res Aging*. 2003;25:275–324.
- [79] Thomas ML, Bangen KJ, Ardel M, et al. Development of a 12-item abbreviated Three-Dimensional Wisdom Scale (3D-WS-12): item selection and psychometric properties. *Assessment*. 2017; 24:71–82.
- [80] Webster JD. An exploratory factor analysis of a self-assessed wisdom scale. *J Adult Dev*. 2003;10:13–22.
- [81] Thomas ML, Bangen KJ, Palmer BW, et al. A new scale for assessing wisdom based on common domains and a neurobiological model: the San Diego Wisdom Scale (SD-WISE). *J Psychiatr Res*. 2017.
- [82] Walsh F. Normal family processes: growing diversity and complexity. New York: The Guilford Press; 2003.
- [83] Repetti RL, Taylor SE, Seeman TE. Risky families: family social environments and the mental and physical health of offspring. *Psychol Bull*. 2002;128:330–366.
- [84] Olson DH, Portner J, Lavee Y. Family Adaptability and Cohesion Evaluation Scale (FACES). St. Paul (MN): University of Minnesota, Family Social Science; 1985.
- [85] Skinner H, Steinhauer P, Santa-Barbara J. The family assessment measure. *Can J Commun Ment Health*. 1983;2:91–105.
- [86] White MA, Wilson ME, Paunonen M, et al. Methodological issues and experiences in international quantitative family research. In: Paunonen M, Vehviläinen-Julkeunen K, editors. Family in nursing – theory, research, and practice. Prvoo: WSOY; 1999. p. 118–136.

- [87] Zimet GD, Dahlem NW, Zimet SG, et al. The Multidimensional Scale of Perceived Social Support. *J Personal Assess.* 1988; 52:30–41.
- [88] George LK, Blazer DG, Hughes DC, et al. Social support and the outcome of major depression. *Br J Psychiatry.* 1989; 154:478–485.
- [89] Koenig HG, Westlund RE, George LK, et al. Abbreviating the Duke Social Support Index for use in chronically ill elderly individuals. *Psychosomatics.* 1993;34:61–69.
- [90] Barch DM, Pagliaccio D, Luking K. Mechanisms underlying motivational deficits in psychopathology: similarities and differences in depression and schizophrenia. *Curr Top Behav Neurosci.* 2016; 27:411–449.
- [91] Taylor M, Bates G, Webster JD. Comparing the psychometric properties of two measures of wisdom: predicting forgiveness and psychological well-being with the Self-Assessed Wisdom Scale (SAWS) and the Three-Dimensional Wisdom Scale (3D-WS). *Exp Aging Res.* 2011;37:129–141.
- [92] Dawes SE, Palmer BW, Allison MA, et al. Social desirability does not confound reports of well-being or demographics by older women. *Age Soc.* 2011;31:438–454.
- [93] Group TW. The World Health Organization Quality of Life Assessment (WHOQOL): position paper from the World Health Organization. *Soc Sci Med.* 1995;41:1403–1409.
- [94] DeSalvo KB, Bloser N, Reynolds K, et al. Mortality prediction with a single general self-rated health question. A meta-analysis. *J Gen Intern Med.* 2006;21:267–275.
- [95] Oswald AJ, Wu S. Objective confirmation of subjective measures of human well-being: evidence from the U.S.A. *Science.* 2010; 327:576–579.
- [96] Moore DJ, Palmer BW, Patterson TL, et al. A review of performance-based measures of functional living skills. *J Psychiatr Res.* 2007;41:97–118.
- [97] Patterson TL, Goldman S, McKibbin CL, et al. UCSD Performance-Based Skills Assessment: development of a new measure of everyday functioning for severely mentally ill adults. *Schizophr Bull.* 2001;27:235–245.
- [98] Mausbach BT, Harvey PD, Goldman SR, et al. Development of a brief scale of everyday functioning in persons with serious mental illness. *Schizophr Bull.* 2007;33:1364–1372.
- [99] Moore RC, Paolillo EW, Heaton A, et al. Clinical utility of the UCSD Performance-Based Skills Assessment-Brief (UPSA-B) in adults living with HIV: associations with neuropsychological impairment and patient-reported everyday functioning difficulties. *PLoS One.* 2017;12:e0183614.
- [100] Cloninger CR. The psychobiological theory of temperament and character: comment on Farmer and Goldberg (2008). *Psychol Assess.* 2008;20:292. discussion 300–304.
- [101] Cloninger CR, Svrakic DM. Integrative psychobiological approach to psychiatric assessment and treatment. *Psychiatry.* 1997; 60:120–141.
- [102] Cloninger CR, Svrakic DM, Przybeck TR. A psychobiological model of temperament and character. *Arch Gen Psychiatry.* 1993;50:975–990.
- [103] Sliwinski MJ. Measurement-burst designs for social health research. *Soc Personal Psychol Compass.* 2008;2:245–261.
- [104] Shiffman S, Stone AA, Hufford MR. Ecological momentary assessment. *Annu Rev Clin Psychol.* 2008;4:1–32.
- [105] Thissen D, Mislevy RJ. Testing algorithms. In: Wainer H, editor. *Computerized adaptive testing: a primer.* 2nd ed. Mahwah (NJ): Lawrence Erlbaum; 2000. p. 101–133.
- [106] Cella D, Yount S, Rothrock N, et al. The Patient-Reported Outcomes Measurement Information System (PROMIS): progress of an NIH Roadmap cooperative group during its first two years. *Med Care.* 2007;45(5): S3–S11.
- [107] Cella D, Riley W, Stone A, et al. The Patient-Reported Outcomes Measurement Information System (PROMIS) developed and tested its first wave of adult self-reported health outcome item banks: 2005–2008. *J Clin Epidemiol.* 2010; 63:1179–1194.