

## Supporting Information

### The Plasticity of Well-being: A Training-based Framework for the Cultivation of Human Flourishing

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**Table S1.** Summary evidence for four dimensions of well-being that exhibit training-induced plasticity.

<b>Dimension</b>	<b>Summary of Evidence</b>
<p><b>Awareness</b> A heightened and flexible attentiveness to perceptual impressions in one’s environment and internal cues, such as bodily sensations, thoughts, and emotions</p>	<p><b>Well-being Indicators</b></p> <ul style="list-style-type: none"> <li>• Attention regulation (1), emotion regulation (2), executive function (3), and overall well-being (4)</li> </ul> <p><b>Neurobiological Underpinnings</b></p> <ul style="list-style-type: none"> <li>• Central-executive network (CEN) (5)</li> <li>• Salience network (SN) (5)</li> </ul> <p><b>Training-related Improvements</b></p> <ul style="list-style-type: none"> <li>• Reduced mind-wandering and increased cognitive control, with altered functioning in associated DMN, SN and CEN networks (5)</li> <li>• Improved mental health and psychological well-being (6)</li> </ul>
<p><b>Connection</b> A subjective sense of care and kinship that promotes supportive relationships and caring interactions</p>	<p><b>Well-being Indicators</b></p> <ul style="list-style-type: none"> <li>• Improved physical health (7), decreased depression (8), increased social support and less loneliness (9)</li> </ul> <p><b>Neurobiological Underpinnings</b></p> <ul style="list-style-type: none"> <li>• Threat and emotion-regulation circuitry (10)</li> <li>• Perspective taking and theory of mind-related circuitry (11)</li> <li>• Empathy and prosocial motivation circuitry (12)</li> </ul> <p><b>Training-related Improvements</b></p> <ul style="list-style-type: none"> <li>• Decreased depression, anxiety, and psychological distress, and increased positive emotions and overall well-being (13)</li> <li>• Increased prosocial behavior (14) and decreased implicit bias (15)</li> </ul>

	<ul style="list-style-type: none"> <li>• Alterations in circuitry related to self-regulation, experience sharing, mentalizing, and social affiliation (12)</li> </ul>
<p><b>Insight</b> Self-knowledge concerning the manner in which emotions, thoughts, beliefs, and other factors are shaping one’s subjective experience and sense of self</p>	<p><b>Well-being Indicators</b></p> <ul style="list-style-type: none"> <li>• Reduced depression and anxiety symptoms (16)</li> <li>• Increased psychological well-being and life satisfaction (17)</li> </ul> <p><b>Neurobiological Underpinnings</b></p> <ul style="list-style-type: none"> <li>• Self-related processes linked to default-mode network (18)</li> <li>• Self-inquiry related to central-executive network (19)</li> </ul> <p><b>Training-related Improvements</b></p> <ul style="list-style-type: none"> <li>• Reduced symptoms of depression, anxiety, and other psychiatric disorders (20)</li> <li>• Altered self-concepts and default-mode network functioning (21)</li> </ul>
<p><b>Purpose</b> Clarity concerning personally meaningful aims and values that one is able to apply in daily life</p>	<p><b>Well-being Indicators</b></p> <ul style="list-style-type: none"> <li>• Physical health (22), cognitive functioning (23), resilience (24), and overall well-being (25)</li> </ul> <p><b>Neurobiological Underpinnings</b></p> <ul style="list-style-type: none"> <li>• Physiological stress mechanisms, including allostatic load (26) and cortisol levels (27)</li> <li>• Emotion- and threat-related brain circuitry (28)</li> <li>• Decision-making circuitry (29)</li> </ul> <p><b>Training-related Improvements</b></p> <ul style="list-style-type: none"> <li>• Bolstered resilience to stress (30)</li> <li>• Increased self-control (31), health behaviors (32), and academic achievement (33)</li> <li>• Alterations in reward brain circuitry (32)</li> </ul>

**Table S2. Typology of Contemporary Interventions and Traditional Contemplative Practices**

This typology categorizes contemporary interventions and traditional contemplative practices in terms of the four dimensions of well-being. While this categorization is based on the primary emphasis in each intervention, please note that each of the interventions listed here is complex and may contain elements related to other dimensions. This typology is also not meant to be exhaustive. We present this as an initial step in the categorization of well-being-oriented practices and interventions. See supplementary materials Section 1S for descriptions of individual practices and interventions, including relevant citations.

Awareness-based Practices and Interventions	Connection-based Practices and Interventions	Insight-based Practices and Interventions	Purpose-based Practices and Interventions
<p><b>Contemporary Interventions</b></p> <ul style="list-style-type: none"> <li>• Acceptance and Commitment Therapy (mindfulness Component)</li> <li>• Cultivating Emotional Balance (mindfulness + attention component)</li> <li>• Dialectical Behavior Therapy (mindfulness component)</li> <li>• Healthy Minds Program (awareness component)</li> </ul>	<p><b>Contemporary Interventions</b></p> <ul style="list-style-type: none"> <li>• Compassion Cultivation Training</li> <li>• Cognitively-based Compassion Training (compassion component)</li> <li>• Cultivating Emotional Balance (compassion component)</li> <li>• Gratitude interventions</li> <li>• Healthy Minds Program (connection component)</li> </ul>	<p><b>Contemporary Interventions</b></p> <ul style="list-style-type: none"> <li>• Cognitive Behavior Therapy (CBT)</li> <li>• Cognitively-based Compassion Training (cognitive component)</li> <li>• Cultivating Emotional Balance (emotion recognition component)</li> <li>• Healthy Minds Program (insight component)</li> <li>• Mindfulness-based Cognitive Therapy</li> </ul>	<p><b>Contemporary Interventions</b></p> <ul style="list-style-type: none"> <li>• Acceptance and Commitment Therapy (values component)</li> <li>• Healthy Minds Program (purpose component)</li> <li>• Signature strengths interventions</li> <li>• Well-being Therapy</li> </ul>

<ul style="list-style-type: none"> <li>• Integrative Body-Mind Training (IBMT)</li> <li>• Mindfulness-Based Attention Training (MBAT)</li> <li>• Mindfulness-based Cognitive Therapy (mindfulness component)</li> <li>• Mindfulness-based Stress Reduction (MBSR)</li> <li>• Mindful Self-Compassion (mindfulness component)</li> <li>• ReSource Training (presence module)</li> </ul>	<ul style="list-style-type: none"> <li>• Mindful Self-Compassion (compassion component)</li> <li>• ReSource Training (affect module)</li> </ul>	<p>(cognitive component)</p> <ul style="list-style-type: none"> <li>• ReSource Training (perspective module)</li> </ul>	
<p><b>Traditional Contemplative Practices</b></p> <ul style="list-style-type: none"> <li>• Breath Counting (Zen)</li> <li>• Body Awareness Practices (Zen/Tibetan)</li> </ul>	<p><b>Traditional Contemplative Practices</b></p> <ul style="list-style-type: none"> <li>• Bodhichitta meditation (Tibetan/Zen)</li> <li>• Intercessory prayer (Christian)</li> </ul>	<p><b>Traditional Contemplative Practices</b></p> <ul style="list-style-type: none"> <li>• Analytical Meditation (Tibetan)</li> <li>• Dzogchen (Tibetan)</li> </ul>	<p><b>Traditional Contemplative Practices</b></p> <ul style="list-style-type: none"> <li>• Contemplations of Mortality (various traditions)</li> <li>• Ignatian discernment (Christian)</li> </ul>

<ul style="list-style-type: none"> <li>• Centering Prayer (Christian)</li> <li>• Choiceless Awareness (various traditions)</li> <li>• Cultivation of Attention (Greco-Roman Philosophy)</li> <li>• Hatha Yoga (body awareness component)</li> <li>• Jhana Practice (Theravada Buddhism)</li> <li>• Mantra Recitation (various traditions)</li> <li>• Shamatha/Calm Abiding (General Buddhism)</li> <li>• Tai Chi Chuan (body awareness component)</li> <li>• Walking meditation (various traditions)</li> </ul>	<ul style="list-style-type: none"> <li>• Loving-kindness and Compassion (Theravada Buddhism, Tibetan)</li> </ul>	<ul style="list-style-type: none"> <li>• Four Foundations of Mindfulness (General Buddhism)</li> <li>• Jesus Prayer (Christian)</li> <li>• Koan Practice (Zen)</li> <li>• Mahamudra (Tibetan)</li> <li>• Muraqaba (Sufi)</li> <li>• Shikantaza (Zen)</li> <li>• Self-inquiry (Advaita Vedanta)</li> <li>• Vipassana/Insight (Theravada Buddhism)</li> </ul>	<ul style="list-style-type: none"> <li>• Four Thoughts (Tibetan)</li> <li>• Lectio Divina (Catholic)</li> <li>• Six Recollections (Theravada Buddhism)</li> </ul>
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## **Section S1. Descriptions and Citations for the Typology of Contemporary Interventions and Traditional Contemplative Practices**

The following descriptions correspond to contemplative practices and contemporary interventions listed in Table 1S. For illustrative purposes, we have provided one relevant citation for each item. Please keep in mind that many practices listed below are hybrids and therefore include elements of multiple dimensions of well-being. This classification system groups interventions according to the dimension of well-being each emphasizes.

### **Awareness-based Contemplative Practices and Interventions**

- **Acceptance and Commitment Therapy** is a therapeutic process that includes the cultivation of mindful awareness as one of its primary components, alongside the clarification and embodiment of meaningful personal values (34).
- **Breath counting**, widely practiced in many Buddhist traditions, entails sustained attention on the movements of the breath while mentally counting inhalations and exhalations (35).
- **Body awareness practices** involve directing the attention toward specific areas of the body, such as the point beneath the navel, and sustaining awareness in that area for extended periods of time. This form of practice is commonly found in many schools of Buddhism. Note: this form of practice is distinct from body awareness practices that involve scanning the body rather than sustaining focus on one point or area (36).
- **Centering Prayer** is a Christian contemplative practice that focuses on the cultivation of inner stillness and receptivity to the presence of God (37).

- **Choiceless Awareness**, a practice found in Tibetan Buddhism, entails releasing attentional focus on a specific object and maintaining awareness of whatever thoughts, feelings, or percepts arise as objects within the field of awareness (38).
- **Cultivating Emotional Balance** is a training program focused on strengthening emotional awareness, insight, and regulation, as well as compassion, through the use of a range of contemplative practices and principles (39).
- The **Cultivation of Attention** was considered a foundational exercise in various forms of Greco-Roman philosophy, especially in the Stoic school, where it was referred to as *prosoche*. Like the practice of choiceless awareness described below, the cultivation of attention often involved bringing awareness to various aspects of present moment experience (40).
- **Dialectical Behavior Therapy** is a clinical intervention designed to aid in the treatment of Borderline Personality Disorder. Present moment awareness of experience is one of four main components of this approach (41).
- **Hatha Yoga** is a traditional Hindu practice that focuses on physical postures accompanied by body-based mindful awareness (42).
- **Healthy Minds Program** includes a range of active and sitting meditation practices, alongside brief science-based lessons, to cultivate four components of well-being: awareness, connection, insight, and purpose. The awareness section contains a course of training to strengthen mindfulness, attention regulation, and emotional awareness (43).
- **Integrative Body-Mind Training** is a contemplative program designed to foster restful alertness of mental and physical states (44).

- **Jhana practice** is a form of meditation found in classical Buddhism and widely practiced in Theravada school. This form of meditation involves sustained concentration on a single object such as the breath, or an emotion such as compassion (45).
- **Mantra recitation** is practiced in most major religions and involves the repetition of a sacred word or phrase, through which the mind becomes increasingly still and concentrated. This style of meditation is perhaps most widely practiced in Transcendental Meditation (TM), though TM also involves elements of the deconstructive family (46).
- **Mindfulness-based Attention Training** – Various programs with this title exist, all of which utilize mindfulness concepts and exercises to strengthen present-centered awareness and the regulation of attention. These programs have been used with the U.S. military (47) and high school students (48).
- **Mindfulness-based Cognitive Therapy** is a clinical intervention that employs elements of Cognitive Behavior Therapy (included in insight section) along with mindfulness practices that foster present-moment awareness of cognitive, affective, and perceptual processes (49).
- **Mindfulness-based Stress Reduction** is a clinical intervention that employs a variety of attentional practices alongside insight-based elements, with the intention of cultivating a non-judgmental, present-moment awareness of the various facets of psychophysiological experience (50).
- **Mindful Self-compassion** is an intervention focused on strengthening mindfulness and prosocial qualities through contemplative practices and principles (51).

- **Resource Project** is a contemplative intervention designed to strengthen three areas: presence (attention and interoceptive awareness), affect (prosocial emotions), and perspective (meta-cognition and perspective taking). The first of these three is designed to strengthen awareness-related mental processes (52).
- **Shamatha (a.k.a. calm abiding or tranquility)**, a common form of meditation training in Tibetan Buddhism, involves resting attention on a specific aspect of experience. This object could be a sensory percept, such as a visual object or physical sensation, a thought (such as a mentally repeated word or sound, such as a mantra), an emotion, such as compassion, or releasing the orientation of attention toward an object and instead sustaining awareness of the process of knowing itself. This form of meditation is similar in many regards to the aforementioned jhana practice (38).
- **Tai Chi Chuan** is a traditional Chinese practice based on Taoist principles that integrates gentle physical movement with body-based awareness (53).
- **Walking meditation** is a form of body-based awareness practice found in a variety of contemplative traditions, in which either slow or normal paced walking is accompanied by awareness of physical sensations.

## Connection-based Contemplative Practices and Interventions

- **Bodhichitta** meditations are a body of practices, commonly practiced in both Zen and Tibetan Buddhism, that revolve around cultivating both the aspiration and active commitment to help all beings achieve freedom from suffering and to fully embody wisdom and compassion (54).
- **Compassion Cultivation Training (CCT)** is a program that employs contemplative practices designed to improve resilience, interpersonal relationships, and well-being (55).
- **Cognitively-based Compassion Training**, rooted in Buddhist contemplative practices, is a secular training program that includes awareness, connection, and insight-based elements. The main emphasis in this approach is to help individuals to train their minds so that compassionate responses become automatic (56).
- **Cultivating Emotional Balance** is a training program focused on strengthening emotional awareness, insight, and regulation, as well as compassion, through the use of a range of contemplative practices and principles (39).
- **Gratitude interventions** are often included in positive psychology-based programs and interventions and use a variety of means, such as journaling and/or guided self-reflection, to cultivate feelings of appreciation and gratitude (57).
- **Healthy Minds Program** includes a range of active and sitting meditation practices, alongside brief science-based lessons, to cultivate four components of well-being: awareness, connection, insight, and purpose. The connection section contains a course of training to strengthen prosocial qualities like appreciation, kindness, and compassion (43).

- **Intercessory prayer** is a common form of prayer in the Christian tradition, in which one petitions God on behalf of another individual who is suffering or in need of support (58).
- **Loving-kindness and compassion**, commonly practiced in Tibetan and Theravada Buddhism, involves systematically cultivating and sustaining the active care and concern to alleviate the suffering (compassion) or nurture the happiness (loving-kindness) of the object of one's meditation, which may be oneself, another being, or all beings (59).
- **Mindful Self-compassion** is an intervention focused on strengthening mindfulness and prosocial qualities through contemplative practices and principles (51).
- **Resource Project** is a contemplative intervention designed to strengthen three areas: presence (attention and interoceptive awareness), affect (prosocial emotions), and perspective (meta-cognition and perspective taking). The first of these three is designed to strengthen awareness-related mental processes (52).

### **Insight-based Contemplative Practices and Interventions**

- **Analytical Meditation**, commonly practiced in Tibetan Buddhism, refers to a form of contemplation in which one either experientially investigates and/or logically analyzes beliefs, views, especially concerning the self (60).

- **Cognitive Behavior Therapy** is a form of psychotherapy that focuses on alleviating symptoms of depression, anxiety, and other psychological problems by helping clients change their thinking, behavior, emotional responses, and the maladaptive self-schema that underlie them (61).
- **Cognitively-based Compassion Training**, rooted in Buddhist contemplative practices, is a secular training program that includes awareness, connection, and insight-based elements. The main emphasis in this approach is to help individuals to train their minds so that compassionate responses become automatic (56).
- **Cultivating Emotional Balance** is a training program focused on strengthening emotional awareness, insight, and regulation, as well as compassion, through the use of a range of contemplative practices and principles (39).
- **Dzogchen** is a Tibetan Buddhist practice that emphasizes effortlessly resting in non-dual awareness (62).
- **Four Foundations of Mindfulness** are classical Buddhist practices common to all forms of Buddhism, but most widely practiced in the Theravada School. In the first two of the four foundations, the emphasis is on bringing awareness to various aspects of the body and to feeling states in order to realize, for example, their transient nature. In the third and fourth of the four foundations, the emphasis is on bringing awareness to various states of consciousness and to the elements of psychophysiological experience (dharmas) (63).

- **Healthy Minds Program** includes a range of active and sitting meditation practices, alongside brief science-based lessons, to cultivate four components of well-being: awareness, connection, insight, and purpose. The insight section contains a course of training to examine the self and self-related processes to gain self-knowledge and understanding (43).
- **Jesus prayer** is a common prayer in Christianity, especially in Orthodox traditions, in which a word or phrase is repeated silently, accompanied by self-analysis and deepening levels of interior awareness (64).
- **Koan practice**, commonly practiced in Zen Buddhism, employs paradoxical stories and phrases to demonstrate the inadequacy of concepts and to elicit a direct experience of non-conceptual wisdom (65).
- **Mahamudra** is a Tibetan Buddhist practice through which a student is guided to a direct experience of the non-dual essence of awareness, in which the sense of being a perceiver or agent that stands apart from the objects of consciousness is absent. Following this introduction, the primary practice involves returning to this recognition over and over again until it stabilizes and can be integrated with various activities and psychological states (66).
- **Mindfulness-based Cognitive Therapy**, mentioned earlier in the attentional meditation section, employs both mindfulness techniques and aspects of Cognitive Behavior Therapy (49).
- **Muraqaba** is a contemplative practice found in the Islamic Sufi tradition in which one's sense of individual identity dissolves and one merges with the divine. In practice, this form of meditation proceeds in stages that involve gaining access to increasingly subtle aspects of consciousness (67).

- **Resource Project** is a contemplative intervention designed to strengthen three areas: presence (attention and interoceptive awareness), affect (prosocial emotions), and perspective (meta-cognition and perspective taking) (52).
- **Shikantaza** is a Zen Buddhist practice in which the simple act of sitting, without effort or contrivance, expresses the awakened presence of mind, a non-conceptual experience in which the dualistic framework of consciousness falls away (68).
- **Self-Inquiry** is a practice from Advaita Vedanta, a Hindu tradition of contemplative practice, that involves cultivating a sustained awareness of the sense of personal identity until it falls away altogether, leading to an experience of non-dual awareness (69).
- **Vipassana/Insight Meditation** is a general term for a class of meditations, widely practiced in Theravada Buddhism, that aim to generate experiential insight into the nature of experience. This class of meditations often includes elements of both object-oriented and subject-oriented insight practices (70).

### **Purpose-based Contemplative Practices and Interventions**

- **Acceptance and Commitment Therapy** is a therapeutic process that includes the cultivation of mindful awareness as one of its primary components, alongside the clarification and embodiment of meaningful personal values (34).
- The **Four Thoughts** are a traditional Tibetan Buddhist practice that involves contemplating the preciousness of human life, death and impermanence, the principle of causality, and the pervasive nature of suffering and dissatisfaction. The main goal

of these contemplations is to promote a prioritization of pursuits that will lead to long-term well-being, rather than short-term gain (54).

- **Contemplation of Mortality** is a practice common to many forms of Buddhism in which an individual contemplates the fragility of life, the many circumstances that can bring an end to life, and other topics that aim to put the meditator in touch with his or her own mortality. There are various aims for these practices, including a calming of the mind and a stabilizing of attention, but one of the primary objectives is to reorient the mind toward what is truly meaningful and of lasting benefit (71).
- **Healthy Minds Program** includes a range of active and sitting meditation practices, alongside brief science-based lessons, to cultivate four components of well-being: awareness, connection, insight, and purpose. The purpose section contains a course of training to clarify and apply personal values and meaningful goals (43).
- **Ignatian discernment** utilizes a series of contemplative exercises to discern life choices in light of God's will (72).
- **Lectio divina** is a traditional Christian practice of reading, meditation and prayer to promote communion with God and understanding of Christian scripture (73).
- **Signature strengths interventions** are commonly used in positive psychology-based interventions and aim to enhance positive psychological functioning and overall well-being by helping individuals to identify their personal strengths and apply them in daily life settings (74).

- The **Six Recollections** are a traditional Theravada Buddhist practice that involves contemplating a series of topics, including recollections of the positive qualities of virtue and generosity, in order to calm and stabilize the mind (75).
- **Well-being Therapy** is a psychotherapeutic strategy designed to enhance well-being. It is based on Carol Ryff's model of psychological well-being, which is comprised of six domains: environmental mastery, personal growth, purpose in life, autonomy, self-acceptance and positive relations with others (76).

#### Citations

1. M. S. Franklin, *et al.*, Tracking Distraction: The Relationship Between Mind-Wandering, Meta-Awareness, and ADHD Symptomatology. *J. Atten. Disord.* **21**, 475–486 (2017).
2. J. J. Gross, Emotion Regulation : Current Status and Future Prospects. *Psychol. Inq.* **26**, 1–26 (2015).
3. A. Diamond, Executive Functions. *Annu. Rev. Psychol.* **64**, 135–168 (2013).
4. M. A. Killingsworth, *et al.*, A wandering mind is an unhappy mind. *Science* **330**, 932 (2010).
5. K. C. R. Fox, *et al.*, Functional neuroanatomy of meditation: A review and meta-analysis of 78 functional neuroimaging investigations. *Neurosci. Biobehav. Rev.* **65**, 208–228 (2016).

6. P. Sedlmeier, *et al.*, The psychological effects of meditation: A meta-analysis. *Psychol. Bull.* **138**, 1139–1171 (2012).
7. J. Holt-Lunstad, T. B. Smith, J. B. Layton, Social relationships and mortality risk: A meta-analytic review. *PLoS Med.* **7** (2010).
8. Z. I. Santini, A. Koyanagi, S. Tyrovolas, C. Mason, J. M. Haro, The association between social relationships and depression: A systematic review. *J. Affect. Disord.* **175**, 53–65 (2015).
9. S. Cacioppo, A. J. Grippo, S. London, L. Goossens, J. T. Cacioppo, Loneliness: Clinical Import and Interventions. *Perspect. Psychol. Sci.* **10**, 238–249 (2015).
10. N. I. Eisenberger, S. W. Cole, Social neuroscience and health: Neurophysiological mechanisms linking social ties with physical health. *Nat. Neurosci.* **15**, 669–674 (2012).
11. J. Zaki, K. Ochsner, The neuroscience of empathy: Progress, pitfalls and promise. *Nat. Neurosci.* **15**, 675–680 (2012).
12. T. Singer, O. M. Klimecki, Empathy and compassion. *Curr. Biol.* **24**, R875–R878 (2014).
13. J. Galante, I. Galante, M. J. Bekkers, J. Gallacher, Effect of kindness-based meditation on health and well-being: A systematic review and meta-analysis. *J. Consult. Clin. Psychol.* **82**, 1101–1114 (2014).
14. P. Condon, G. Desbordes, W. B. Miller, D. DeSteno, Meditation increases compassionate responses to suffering. *Psychol. Sci.* **24**, 2125–7 (2013).

15. Y. Kang, J. R. Gray, J. F. Dovidio, The nondiscriminating heart: lovingkindness meditation training decreases implicit intergroup bias. *J. Exp. Psychol. Gen.* **143**, 1306–13 (2014).
16. M. Nakajima, K. Takano, Y. Tanno, Adaptive functions of self-focused attention: Insight and depressive and anxiety symptoms. *Psychiatry Res.* **249**, 275–280 (2017).
17. R. Harrington, D. A. Loffredo, Insight, rumination, and Self-Reflection as predictors of well-being. *J. Psychol. Interdiscip. Appl.* **145**, 39–57 (2011).
18. M. E. Raichle, The Brain’s Default Mode Network. *Annu. Rev. Neurosci.* **38**, 433–447 (2015).
19. U. Herwig, T. Kaffenberger, L. Jäncke, A. B. Brühl, Self-related awareness and emotion regulation. *Neuroimage* **50**, 734–741 (2010).
20. S. G. Hofmann, A. Asnaani, I. J. J. Vonk, A. T. Sawyer, A. Fang, The efficacy of cognitive behavioral therapy: A review of meta-analyses. *Cognit. Ther. Res.* **36**, 427–440 (2012).
21. N. A. Farb, P. A. Desormeau, L. A. Dinh-Williams, P. A. Desormeau, L. A. Dinh-Williams, “The neuroscience of hypo-egoic processes” in *The Oxford Handbook of Hypo-Egoic Phenomena*, (2016), pp. 109–131.
22. R. Cohen, C. Bavishi, A. Rozanski, Purpose in life and its relationship to all-cause mortality and cardiovascular events: A meta-

analysis. *Psychosom. Med.* **78**, 122–133 (2016).

23. N. A. Lewis, N. A. Turiano, B. R. Payne, P. L. Hill, Purpose in life and cognitive functioning in adulthood. *Aging, Neuropsychol. Cogn.* **24**, 662–671 (2017).
24. A. Feder, E. J. Nestler, D. S. Charney, Psychobiology and molecular genetics of resilience. *Nat. Rev. Neurosci.* **10**, 446–57 (2009).
25. V. H. Fetvadjev, J. He, The longitudinal links of personality traits, values, and well-being and self-esteem: A five-wave study of a nationally representative sample. *J. Pers. Soc. Psychol.* **117**, 448–464 (2019).
26. S. Zilioli, R. B. Slatcher, A. D. Ong, T. L. Gruenewald, Purpose in life predicts allostatic load ten years later. *J. Psychosom. Res.* **79**, 451–457 (2015).
27. N. Fogelman, T. Canli, ‘Purpose in Life’ as a psychosocial resource in healthy aging: An examination of cortisol baseline levels and response to the trier social stress test. *npj Aging Mech. Dis.* **1**, 2–4 (2015).
28. S. M. Schaefer, *et al.*, Purpose in life predicts better emotional recovery from negative stimuli. *PLoS One* **8** (2013).
29. Y. Kang, V. J. Strecher, E. Kim, E. B. Falk, Purpose in life and conflict-related neural responses during health decision-making. *Heal. Psychol.* **38**, 545–552 (2019).

30. J. D. Creswell, *et al.*, Affirmation of personal values buffers neuroendocrine and psychological stress responses. *Psychol. Sci.* **16**, 846–851 (2005).
31. A. Burson, J. Crocker, D. Mischkowski, Two Types of Value-Affirmation: Implications for Self-Control Following Social Exclusion. *Soc. Psychol. Personal. Sci.* **3**, 510–516 (2012).
32. Y. Kang, *et al.*, Effects of self-transcendence on neural responses to persuasive messages and health behavior change. *Proc. Natl. Acad. Sci.* **115**, 9974–9979 (2018).
33. D. S. Yeager, *et al.*, Boring but important: A self-transcendent purpose for learning fosters academic self-regulation. *J. Pers. Soc. Psychol.* **107**, 559–580 (2014).
34. S. C. Hayes, J. B. Luoma, F. W. Bond, A. Masuda, J. Lillis, Acceptance and Commitment Therapy: Model, processes and outcomes. *Behav. Res. Ther.* **44**, 1–25 (2006).
35. R. Aitken, *Taking the path of Zen* (North Point Press, 1982).
36. J. D. Looi, *The eight gates of Zen: A program of Zen training* (Shambhala Publications, 2002).
37. T. Keating, *The foundations for centering prayer and the Christian contemplative life* (Bloomsbury Publishing, 2002).
38. Y. M. Rinpoche, E. Swanson, Y. M. Rinpoche, R. Y. Mingyur, E. Swanson, *The Joy of Living: Unlocking the Secret and Science of*

*Happiness* (Random House, 2010).

39. E. Ekman, P. Ekman, “Cultivating emotional balance: Structure, Research, and implementation” in *Compassion: Bridging Practice and Science*, (2013), pp. 398–414.
40. P. Hadot, *Philosophy as a way of life: Spiritual exercises from Socrates to Foucault* (Oxford: Blackwell, 1995).
41. M. M. M. Linehan, *et al.*, Dialectical behavior therapy for patients with borderline personality disorder and drug-dependence. *Am. J. Addict.* **8**, 279–292 (1999).
42. S. Muktibodhananda, *Hatha yoga pradipika* (Sri Satguru Publications, 2012).
43. S. B. Goldberg, *et al.*, Awareness, Connection, and Insight: Testing a multi-component, self-guided, smartphone-based meditation app in a three-armed randomized controlled trial. *JMIR Ment. Heal.* **in press** (2020).
44. Y. Y. Tang, M. I. Posner, Attention training and attention state training. *Trends Cogn. Sci.* **13**, 222–227 (2009).
45. H. Gunaratana, *The path of serenity and insight: an explanation of the Buddhist Jhānas* (Motilal Banarsidass, 1995).
46. M. Yogi, *Science of being and art of living: Transcendental Meditation* (Meridian, 1995).
47. A. P. Jha, *et al.*, Comparing Mindfulness and Positivity Trainings in High-Demand Cohorts. *Cognit. Ther. Res.* (2020)  
<https://doi.org/10.1007/s10608-020-10076-6>.

48. A. J. Mrazek, *et al.*, Mindfulness-Based Attention Training: Feasibility and Preliminary Outcomes of a Digital Course for High School Students. *Educ. Sci.* **9**, 230 (2019).
49. Z. V. Segal, J. M. G. Williams, J. D. Teasdale, *Mindfulness-based cognitive therapy for depression* (Guilford Press, 2012).
50. J. Kabat-Zinn, *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain, and illness* (Bantam, 2013).
51. K. D. Neff, C. K. Germer, A Pilot Study and Randomized Controlled Trial of the Mindful Self-Compassion Program. *J. Clin. Psychol.* **69**, 28–44 (2013).
52. C. Singer, T., Kok, B. E., Bornemann, B., Zurborg, S., Bolz, M., & Bochow, The ReSource Project: Background, design, samples, and measurements. *Max Planck Inst. Hum. Cogn. Brain Sci.* (2016).
53. S. L. Wolf, C. Coogler, T. Xu, Exploring the basis for Tai Chi Chuan as a therapeutic exercise approach. *Arch. Phys. Med. Rehabil.* **78**, 886–892 (1997).
54. Y. M. Rinpoche, *Turning Confusion into Clarity: A Guide to the Foundation Practices of Tibetan Buddhism* (Snow Lion Publications, 2014).
55. H. Jazaieri, *et al.*, Enhancing Compassion: A Randomized Controlled Trial of a Compassion Cultivation Training Program. *J. Happiness Stud.* **14**, 1113–1126 (2013).

56. S. D. Reddy, *et al.*, Cognitive-Based Compassion Training: A Promising Prevention Strategy for At-Risk Adolescents. *J. Child Fam. Stud.* **22**, 219–230 (2013).
57. A. M. Wood, J. J. Froh, A. W. A. Geraghty, Gratitude and well-being: A review and theoretical integration. *Clin. Psychol. Rev.* **30**, 890–905 (2010).
58. L. Roberts, I. Ahmed, S. Hall, A. Davison, Intercessory prayer for the alleviation of ill health. *Cochrane Database Syst. Rev.* (2009) <https://doi.org/10.1002/14651858.CD000368.pub3>.
59. S. Salzberg, *Lovingkindness: The Revolutionary Art of Happiness* (Shambhala, 2002).
60. D. Lama, *The Middle Way: Faith Grounded in Reason* (Wisdom Publications, 2014).
61. A. T. Beck, The Current State of Cognitive Therapy. *Arch. Gen. Psychiatry* **62**, 953–959 (2005).
62. T. U. Rinpoche, *As It Is, Vol. 2* (Rangjung Yeshe Publications, 2000).
63. J. Goldstein, *Mindfulness: A practical guide to awakening* (Sounds True, 2013).
64. F. Mathewes-Green, *The Jesus prayer: The ancient desert prayer that tunes the heart to God* (Paraclete Press, 2009).
65. P. Kapleau, *The three pillars of Zen* (Doubleday, 1980).

66. K. T. Rinpoche, *Crystal Clear: Practical Advice for Mahamudra Meditators* (Rangjung Yeshe Publications, 2004).
67. K. S. Azeemi, *Muraqaba: The Art and Science of Sufi Meditation* (Plato Publishing, 2005).
68. E. Dogen, *Beyond thinking: A guide to Zen meditation*. (Shambhala Publications, 2004).
69. R. Maharshi, *Be as you are: The teachings of Sri Ramana Maharshi* (Arkana, 1985).
70. J. Goldstein, *Insight Meditation: The Practice of Freedom* (Shambhala Publications, 2003).
71. J. Halifax, *Being with Dying: Cultivating Compassion and Fearlessness in the Presence of Death* (Shambhala Publications, 2009).
72. D. L. Fleming, *What is Ignatian spirituality?* (Loyola Press, 2010).
73. T. Hall, *Too deep for words: Rediscovering lectio divina* (Paulist Press, 1988).
74. W. Ruch, R. M. Niemiec, R. E. McGrath, F. Gander, R. T. Proyer, Character strengths-based interventions: Open questions and ideas for future research. *J. Posit. Psychol.* **15**, 1–5 (2020).
75. B. Buddhaghosa, *The path of purification: Visuddhimagga* (Buddhist Publication Society, 1991).
76. G. A. Fava, C. Rafanelli, M. Cazzaro, S. Conti, S. Grandi, Well-being therapy. A novel psychotherapeutic approach for residual symptoms of affective disorders. *Psychol. Med.* **28**, 475–480 (1998).

