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What's the difference between measures of wellbeing, quality of life, resilience, and coping? An umbrella review and concept map of 155 measures of positive mental health

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Abstract: The multitude of definitions, models, and measures of positive mental health has hindered academic precision and therefore the ongoing scientific evolution of this important area. This umbrella review aimed to synthesize the theoretical landscape of positive mental health, by reviewing measures that were designed to capture overarching, multi-dimensional concepts of positive and adaptive states of mental health (i.e., wellbeing, quality of life, and resilience/coping), and interrogating their underlying dimensions (e.g., vitality, autonomy) and design features (e.g., response scales, item valence). Our search identified 155 measures of positive mental health with a total of 410 constituent dimensions. Using thematic analysis, we consolidated these 410 original dimensions into a set of 21 themes. These themes were transformed into a concept map to illustrate their inter-relationship with the overarching concepts of positive mental health as identified in this review. Our results point to a lack of consensus on the underlying dimensions and measurement approaches for investigating positive mental health, with singular measures failing to capture its breadth, resulting in an unwieldy situation for ongoing scientific inquiry.

Public significance statement: In the absence of consensus on definitions or models of positive and adaptive states of mental health, an unwieldy, and untenable number of measures have been created - many devoid of a clear conceptual framework. The current review summarizes the measurement landscape of positive mental health and presents a preliminary synthesis of 410 dimensions scientists claim to capture this elusive construct. The current review can help inform future measurement and theory development and further guide researchers toward precise, replicable, durable mental health research.

Keywords: mental health; wellbeing; resilience; quality of life; coping; measurement

1. Introduction

Mental health or feeling mentally healthy is a universally valued outcome (Alexandrova, 2012). Investigation of the correlates, predictors, and outcomes of feeling mentally *healthy*, as distinct from those related to mental *illness*, has grown in recent decades (Cebral-Loureda et al., 2022; Rusk & Waters, 2013). The importance of positive mental health, often described simply as feeling

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good and functioning well (Huppert, 2005), is recognized across many disciplines (Diener et al., 2017; Jankowski et al., 2020; Lutz et al., 2021), however, challenges of defining and measuring positive mental health and its related terms have been widely documented (Barry, 2009; Dodge et al., 2012; Näsman et al., 2022; Vaillant, 2012). This poses clear challenges, as the benefits of focusing on positive mental health for individuals, as well as for the improvement of practice and policy (e.g., Carpenter et al., 2022; Dykxhoorn et al., 2022), can only be optimally realized with clear definitions and terminology, and matching precise and comparable measurement tools (VanderWeele, 2017).

1.1 A confusing measurement landscape

Commenting on the state of happiness (i.e., wellbeing) research in 1988, Fordyce (1988, p. 357) stated that "to the newcomer in this field, it would appear the alternatives [of measures] are endless – and the perception is largely true. Over the years, no measure of "feeling well" has emerged as a standard reference point for ongoing study. In fact, just the opposite seems to be the case" (p. 357). More than 35 years later, these issues continue to limit the field, and a standard on how to choose among the multitude of outcome measures is missing (VanderWeele et al., 2020). As an illustration of the magnitude of the problem, a review by Linton et al. (2016) identified 99 measures, which together included 196 'distinct' dimensions of positive mental health. These 196 synthesized dimensions are unlikely to all be unique components of feeling well (e.g., consider the similarities between energy level and vitality), with the paper acting as an exemplar of how insufficient theory, ambiguous definitions, conflation between terms, content creep and unclear construct operationalization hinder the precision and scientific validity of positive mental health research (Baker & Intagliata, 1982; Jackson & Haslam, 2022).

While there is general consensus that positive mental health is more than the absence of mental illness (Jahoda, 1958), a universally accepted definition of the concept does not yet exist (Marsh et al., 2020). Vaillant (2012) discussed numerous models through which positive mental health could be considered, such as optimal functioning, the presence of multiple strengths, the dominance of positive emotions or satisfaction with life, or resilience. Definitions of mental health tend to reflect some combination of these positive mental health models. For example, the definition from the World Health Organization (WHO) which defines mental health as "a state of wellbeing in which an individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively, and is able to make a contribution to his or her community"(World Health Organization, 2001, p. 1).

The above paragraph alludes to two key challenges. Firstly, definitions and models of positive mental health from within and between disciplines include different but related elements. Bibliometric analysis shows that a range of related terms often appear together in keywords of studies of positive mental health, including quality of life, resilience, wellbeing, life satisfaction, positive emotion, subjective wellbeing, psychological wellbeing and flourishing (Cebral-Loureda et al., 2022). The definitions by leading authorities in health and mental health often include reference to multiple concepts. For example, like the WHO, the American Psychological Association's (APA) definition of mental health refers to both coping and wellbeing, which in turn, is defined with a reference to quality of life (American Psychological Association, 2022c, 2022e). Similarly, definitions on quality of life such as "subjective quality of life reflects an individual's overall perception of and satisfaction with how things are in their life" (Wood-Dauphinée et al., 2002, p. 137) or "the satisfaction of an individual's values, goals and needs through the actualization of their abilities or lifestyle" (Emerson, 1985, p. 282), reference concepts often associated with positive mental health or wellbeing (Post, 2014). This indicates

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that positive mental health transcends narrower (discipline-specific) conceptualizations of what it means to feel well (i.e., subjective wellbeing or happiness), which has to be taken into account by any unifying approaches and measurement methods.

Secondly, theories and measurement methods are often 'extensional' in nature. Extensional definitions give meaning to a term by specifying objects that fall under the definition of the term in question. In other words, positive mental health is often defined by a specific set of feelings we experience and behaviors we exhibit (Olsson et al., 2015; Posner, 1986). Positive mental health is frequently conceptualized by listing some set of dimensions of "emotional (affect/feeling), psychological (positive functioning), social (relations with others and society), physical (physical health) and spiritual (sense of meaning and purpose in life) wellbeing" (Barry, 2009, p. 6). There are many examples of extensional definitions of positive mental health in the literature, for example, the model by Huppert and So (2013) which extensionally defined positive mental health as ten positive states including perceptions of competence, emotional stability, engagement, meaning, optimism, positive emotion, positive relationships, resilience, self-esteem, and vitality. Similarly, Ryff and Keyes' (1995) well-cited extensional definition proposed six defining features of psychological wellbeing (often used to represent positive mental health): perceptions of self-acceptance, purpose in life, environmental mastery, positive relationships, autonomy, and personal growth.

These are just a couple of a plethora of extensional definitions of positive mental health that exist in the literature. The consequence is a plurality of partially overlapping multi-dimensional models and accompanying measures (Ackerman et al., 2018), where positive mental health is defined and operationalised by constructing sets of often arbitrarily chosen dimensions (Keller, 2020). Extensional definitions of positive mental health are not inherently problematic, and may even be the most appropriate approach for positivist assessment of an 'indefinable' concept such as positive mental health (Thorén & Persson, 2015), however defining the construct of positive mental health with an ever-expanding set of dimensions will not serve scientific or parsimonious precision or assessment. Echoing Fordyce (1988), academics, practitioners, and policy makers remain at a crossroads, unable to decide on what constitutes a dimension or even a measure of positive mental health.

1.2 The current study

There is a fundamental scientific need to consolidate the ever-expanding multi-dimensional nature of positive mental health into a set of uniform dimensions, both to do justice to the interdisciplinary nature of research on the topic and its inherent multi-faceted nature. This is not a unique endeavor, and precedent for the value of conducting such a synthesis has been demonstrated in other scientific areas. For example, a group of scholars studying health behavior change developed the Theoretical Domains Framework (TDF) to create a unifying framework of determinants that lead to positive behavior change (Cane et al., 2012). Using a thorough, iterative process, the researchers simplified 112 theoretical constructs into 14 simplified dimensions or 'factors' (e.g., knowledge, skills) that underpin behavior change. The result was a theoretical framework that demonstrated how the consolidation of overlapping psychological theories could be used to advance intervention design, implementation science, qualitative research, measurement and even influenced the subsequent creation of ontologies (Atkins et al., 2017; Hastings & Roeser, 2020).

This study sets out to create such a synthesis using a different methodology. Rather than placing theories at the heart of the current study, it was decided to center our synthesis efforts on existing positive mental health measurement tools. Reviewing measures not only allows us to

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interrogate the theoretical components of positive mental health, but also facilitates investigation of how positive mental health has been operationalized into measures for academic research and how these measures assess the multi-dimensional nature of positive mental health. By doing so we can assess the areas of theoretical overlap and differences between key terms in the literature, which in turn can facilitate the consolidation of the landscape into a minimal number of distinct dimensions (Granlund et al., 2021; Huhta et al., 2018; Sørensen et al., 2012). At the same time, it means we can also synthesize the design features (e.g., response scales, reference period) of measures, thereby accelerating scientific precision and forming a framework for scientific practice (Alexandrova, 2017; Dahl et al., 2020). It helps to clarify the strengths and weaknesses of current measurement approaches and will feed into wider discourse on the need to improve the rigor of scale development in psychology and behavioral science (Boateng et al., 2018).

2. Method

This systematic review was registered in PROSPERO International Prospective Register of Systematic Reviews and designed as an umbrella review of reviews (CRD42021237505). This study is the first step of a larger project aiming to develop a taxonomy and item bank of positive mental health. The pre-registered protocol of this larger project is available on the Open Science Framework (OSF) website (https://osf.io/d6qae/) and summarized in Table S1.

The current search identified measures of positive mental health by systematically searching for published reviews that focused on overarching, multi-dimensions of positive mental health, rather than positive mental health or mental health itself. Previous reviews by our team have identified that using the term 'mental health' can exponentially increase search results making them logistically unfeasible (van Agteren et al., 2021). The term positive mental health was not included in the search as no review of measures of positive mental health could be identified.

The overarching concepts of wellbeing, resilience/coping, or quality of life were selected as they are each generic terms that are (1) often used synonymously with positive mental health, (2) represent extensional multi-dimensional lists of positive mental health dimensions, (3) are explicitly and/or implicitly referred to in various definitions (for example, see the WHO or APA definitions above) and measures of positive mental health (for example, see the WHOQoL (The Whoqol Group, 1998)), and (4) are commonly identified in research and reviews of the concept of positive mental health (Cebral-Loureda et al., 2022; Fusar-Poli et al., 2020).

The pre-registration of the systematic review only mentioned the umbrella concepts of wellbeing, resilience, and quality of life as it was originally considered that resilience would subsume coping; however, it was later identified that articles on coping were often published without reference to the term resilience.

2.1 Search strategy

Searches were conducted in Scopus, PsycInfo, PubMed, and CINHAL using keywords in April 2022. The search terms covered the following: (1) wellbeing OR well-being OR quality of life OR resilience OR coping; AND (2) measurement OR measure OR measures OR questionnaire OR survey OR checklist OR tool OR scale OR index OR instrument OR inventory; AND (3) review. The search was limited to "article title" only to manage the large results (>20,000 results returned when abstract and keywords were included) and was tested with initial searches which successfully yielded both highly focused and widely scoped reviews but also ensured project feasibility.

2.2 Stage 1: Data screening

Articles were included if they met the following criteria: (1) were reviews or meta-analyses of measures; (2) articles included measures designed for use in adults, (3) included measures designed for assessing positive or adaptive states of mental health including wellbeing or its facets, quality of life (excluding disease-specific, for example, cancer-specific quality of life), resilience/coping, (4) included measures that were available in English. Book chapters, dissertations, and conference proceedings were excluded. While it is usual practice for umbrella reviews to only include the highest level of evidence quality (Aromataris et al., 2015), the primary focus of this review was to identify measures rather than to establish the evidence quality of such measures. Lower quality reviews were therefore still screened and included.

Two researchers (MI, KA) independently screened titles and abstracts, and selected articles for full-text review, which were then independently reviewed for inclusion criteria (Cohens' kappa = .81). In addition, we performed a manual search of the references of included articles. From each included article, the following information was extracted: first author, year of publication, umbrella term of mental health focus, review focus or population, and included measures of positive mental health. As the primary aim of the review was to create an inventory of measures of positive mental health, an assessment of the risk of bias in the included articles was not deemed required.

2.3 Stage 2: Identification of measures

Included reviews were used to identify measures of wellbeing, quality of life, and resilience/coping. Measures were included if they were: (1) designed for assessing positive states of mental health including wellbeing or its facets, quality of life, and resilience/coping, (2) designed for general use (i.e., not disease-specific), (3) designed for use in adults, and (4) available in English. Measures were excluded if the focus was on: (1) a specific physical disease (e.g., cancer), (2) a specific context (i.e., pregnancy), or (3) designed and validated in children and adolescents only. Only validated measures with adequate psychometric properties were included meaning that measures were excluded if no peer-reviewed articles could be found assessing the validity or performance of the measure.

Three independent coders (MI, JvA, EK) screened all abstracts and coded reviews for the inclusion of relevant measures. Key information was extracted on the design features of each measure, including the length of each measure, the response scales, response formats, timeframes, valence of items and scoring procedures used.

2.4 Stage 3: Synthesis and thematic coding of identified dimensions

We first extracted the list of 'original' dimensions used in measures by investigating the original validation papers of the identified measures. Other information that was extracted included definitions or descriptions of the dimensions, and items that belonged to each of the dimensions. In the absence of original validation papers, secondary validation papers were used to identify and describe original dimensions. Original dimensions were loosely considered 'latent variables' or 'subscales' as they were often defined by factor analyses. Original dimensions were not considered a dimension for the purpose of this paper if they were informed by singular items in the measure. The result of this extraction was a large list of unchanged, original dimensions, i.e., a list of dimensions as they were named by the authors of the original article, their descriptions, and their items. To quantify the number of 'unique' terms included in this list, duplicate terms

were removed, however, many possible synonyms remained (e.g., positive affect and happiness) which may or may not have referred to the same constructs.

To investigate the similarity or difference between these synonyms, we set out to qualitatively synthesize the original dimensions into themes. This process was conducted using a hybrid approach of thematic analysis using both a deductive, a priori template of codes (Table 1) and inductive data-driven codes (Fereday & Muir-Cochrane, 2006). This ensured that the central dimensions of positive mental health could be integral throughout the analysis, while allowing for novel themes to emerge directly from the data.

To develop the deductive coding manual, a preliminary list of dimensions was constructed via the combination of dimensions and definitions based on two previous lists (Table 1). The first source (Longo et al., 2017) narratively reviewed multiple popular psychological theories related to positive mental health (derived from hedonic wellbeing, eudaimonic wellbeing, and self-determination theory (Diener et al., 2010; Huppert & So, 2013; Keyes, 2002; Ryan et al., 2008; Seligman, 2011; Waterman et al., 2010) and synthesized a list of dimensions and their definitions in preparation for the design of a novel measurement tool. The second source (Linton et al., 2016) reviewed 99 measures of positive mental health using a broader definition which included non-psychological aspects of the concept. After consultation with an expert panel of three scientists with relevant experience in the measurement of mental health (see acknowledgements) and testing the reliability of the codes, several refinements were made to the coding list. Self-worth and self-acceptance were merged into one singular dimension of 'self-Acceptance'. This change was made as the description and items of both dimensions showed considerable overlap. Similarly, the domains of involvement and self-awareness were merged and renamed as Engagement.

Following Fereday & Muir-Cochrane (2006), two reviewers (MI, JvA) read through the qualitative data (original dimension definitions and items) and identified initial inductive themes. The coders took note of any patterns of dimensions that did not fit neatly into just one deductive theme. Next the reviewers independently commenced the coding process of the original dimensions by interrogating their descriptions and definitions (Cohens' kappa = .79). We firstly used original dimension titles and definitions to guide coding and when absent we assessed representative scale items. Measures where definitions or items could not be identified (e.g., because it was not possible to gain access to a scoring sheet that matched items to dimensions) were not recoded. Discrepancies in judgment were resolved via discussion. While most dimensions fit within the predefined areas, patterns for deviations followed three scenarios. Firstly, original dimensions could measure (fall within) multiple simplified dimensions. If there was no clear emphasis on one over the other within the scale, the dimensions were not coded, but labeled 'indiscriminate'. Secondly, the dimension could measure 'opposites', such as is the case in for example happiness and depression. The team labeled the dimensions according to the original valence (e.g., happiness or distress) and would label it indiscriminate if the dimension did not clearly point to a valence direction. Thirdly, some original dimensions consistently did not fit the deductive code list, and warranted introducing more precision, because items pointed to more than one area within that dimension. These inductive themes were paired with existing theoretical positive mental health constructs, including life satisfaction, autonomy, sense of community, avoidant coping, emotion-focused coping, and problem-focused coping (Table 1). Further, the deductive codes of Significance and Purpose were also merged into a singular dimension of 'Meaning & Purpose', as most original dimensions asked about meaning and significance together, rather than as two separate ideas.

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The result of this process was a final set of themes, see Table 1. The two reviewers (MI, JvA) subsequently completed a second round of coding, by going through the entire list of original dimensions together to check their deductive coding according to the refined coding set (now including inductive themes), resulting in the final dimension themes. Counts and proportions of original dimensions featured in reviews of measures of wellbeing, quality of life, and resilience/coping were calculated.

Table 1. Coding set of dimensions and definitions

Reference	Deductive code list	Renamed, merged, or inductively identified	Definition
(Longo et al., 2017)	Happiness		States that are characterized by moderate-arousal pleasant feelings, such as feeling happy, cheerful and pleased.
	Vitality		States characterized by high-arousal pleasant feelings, such as feeling energetic and lively.
	Calmness		States characterized by low-arousal pleasant feelings, like serenity and peacefulness.
	Optimism		Having a positive outlook on and expectations about the future.
	Involvement Awareness[1]	Engagement	Combination of Longo et al., 2017 Involvement (Having an absorbing experience in which the individual is completely focused on the task at hand; the flow state) and Self-awareness (consists in knowing oneself and experiencing a state of mindful awareness).
	Self-acceptance Self-worth	Self-acceptance	Combination of Longo et al., 2017 Self-acceptance (Experiencing different aspects of oneself [e.g., one's past, personality, thoughts, and feelings] in a tolerant, receptive and non-judgmental way) and self-worth (Holding positive evaluations and feelings about oneself).
	Competence		Feeling and perceiving oneself as effective and able to overcome challenges, stressors and adversity, and achieve desired outcomes; feeling resilient.
	Development		Experiencing continuous growth and improvement.
	Purpose Significance	Meaning and purpose	Combination of Longo et al. 2017 purpose (Having clear goals, a sense of direction and a larger aim in life) and significance (The feeling that what we do is worthwhile, rewarding and valuable).
	Self-congruence		The perception that our actions and behaviors are compatible with our interests, values, and beliefs.
	Connection	Personal relationships	Involves a feeling of belonging, mutual caring, love, and closeness to friends, family and loved ones; positive relationships.

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[1] The original term used in Longo et al, 2017 was self-awareness.

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Table 1. (Cont.) Coding set of dimensions and definitions

Reference	Deductive code list	Renamed, merged, or inductively identified	Definition
(Linton et al., 2016)	Activities and functioning		Behavior and activities that characterize daily life. This involves the specific activities we fill our time with, and our ability to undertake these tasks.
	Physical wellbeing	Physical health	The quality and performance of bodily functioning. This includes having the capacity to sense the external environment and our experiences of pain and comfort.
	Spiritual wellbeing	Spirituality	Spiritual wellbeing is concerned with meaning, a connection to something greater than oneself and in some cases faith in a higher power.
	Personal circumstances		Personal circumstances are related to the conditions and external pressures that an individual faces. This involves numerous environmental and socioeconomic concerns such as financial security.
(Veenhoven, 1996)		Life satisfaction	The degree to which a person positively evaluates the overall quality of their life as a whole. In other words, how much the person likes the life they lead.
(Ryan & Deci, 2000)		Autonomy	The perception that we have ownership over our behavior and choices.
(Keyes, 1998)		Sense of community	A sense of belonging to a community and making a contribution to wider society; social wellbeing.
(American Psychological Association, 2022a)		Avoidance coping	Any behavioral, cognitive, or emotional strategy for managing a stressful event or situation in which a person does not address the problem directly but instead disengages from the situation and averts attention from it.
(American Psychological Association, 2022b)		Emotion-focused coping	A stress-management strategy in which a person focuses on regulating his or her negative emotional reactions to a stressor.
(American Psychological Association, 2022d)		Problem-focused coping	A stress-management strategy in which a person directly confronts a stressor in an attempt to decrease or eliminate it.

2.5 Stage 4: Mapping the conceptual relationship between umbrella concepts

To detail the relationship between the synthesized dimensions and the umbrella concepts of wellbeing, quality of life, and resilience/coping, we transformed the extracted data pertaining to the recoded dimensions into a concept map. The concept map was used to visualise the most central and peripheral dimensions relative to the umbrella terms. We calculated the proportion of times that a synthesized dimension appeared in a measure of each umbrella concept. For example, when a measure included the dimension of optimism, it was associated with wellbeing 47% of the time, quality of life 45% of the time, and resilience/coping less than 8% of the time.

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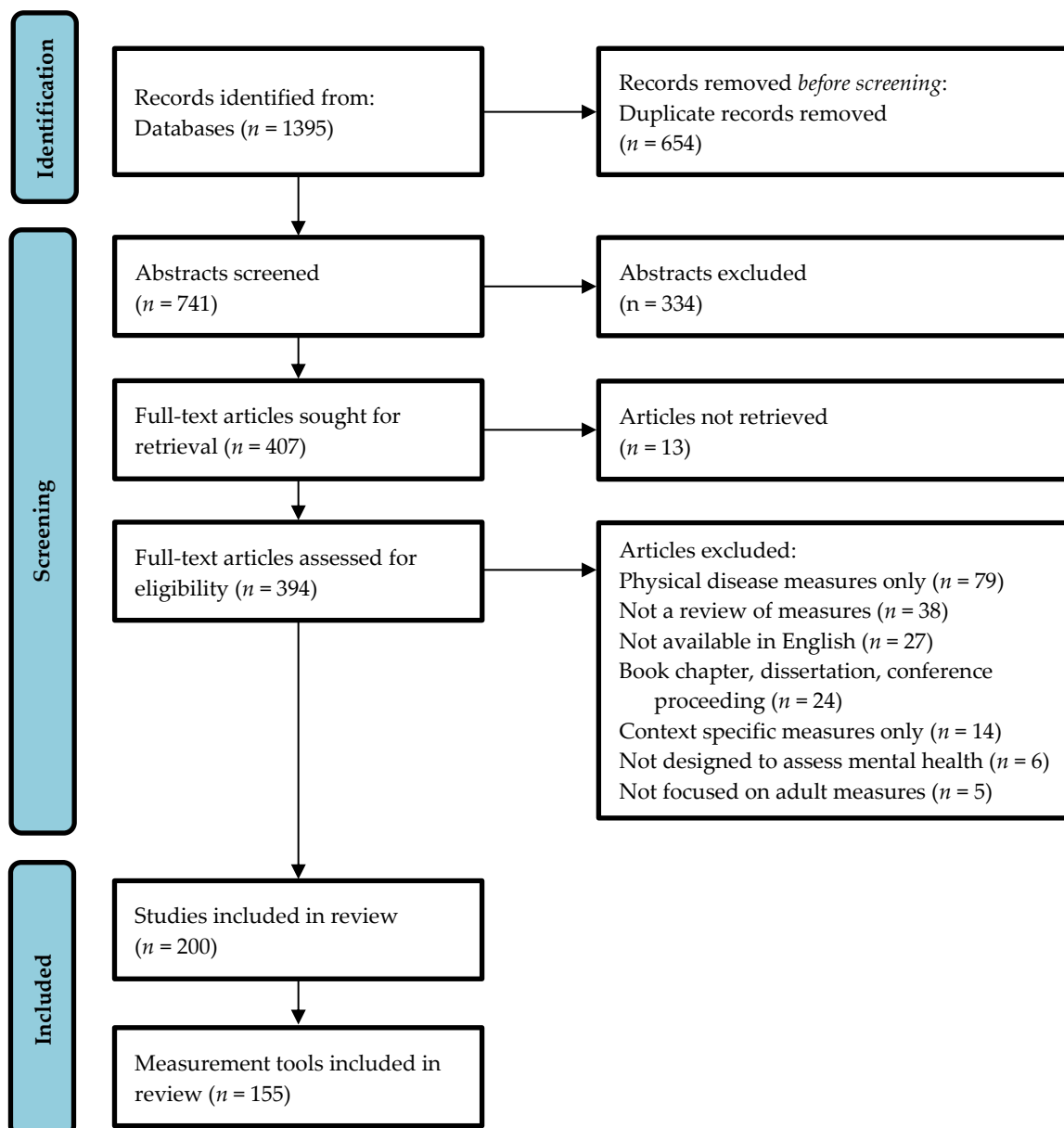
The open-source software Gephi (Bastian et al., 2009) was used to visually map the data, using the layout algorithm ForceAtlas2. Gephi has been used to create similar maps (Cebral-Loureda et al., 2022; Rusk & Waters, 2013). The algorithm produces a visualization with similar dimensions physically closer (as in the example above, optimism emerges in close proximity to both wellbeing and quality of life, while distant to resilience/coping).

3. Results

3.1 Included reviews

Figure 1 displays the PRISMA statement for the umbrella review results (Page et al., 2021). Out of 741 records screened, a total of 200 review papers were extracted (see Supplementary Materials Table S2). Most reviews explored the umbrella concept of quality of life (85.0%, $n = 170$), followed by wellbeing (8.0%, $n = 16$), resilience (6.0%, $n = 12$), and coping (1.0%, $n = 2$). See Supplementary Materials Table S3 for a summary of the specific subject topics of the extracted reviews.

Figure 1. *PRISMA statement*

Identification

Records identified from:
Databases ($n = 1395$)

Records removed *before screening*:
Duplicate records removed
($n = 654$)

Screening

Abstracts screened
($n = 741$)

Abstracts excluded
(n = 334)

Full-text articles sought for retrieval ($n = 407$)

Articles not retrieved
($n = 13$)

Full-text articles assessed for eligibility ($n = 394$)

Articles excluded:
Physical disease measures only ($n = 79$)
Not a review of measures ($n = 38$)
Not available in English ($n = 27$)
Book chapter, dissertation, conference
     proceeding ($n = 24$)
Context specific measures only ($n = 14$)
Not designed to assess mental health ($n = 6$)
Not focused on adult measures ($n = 5$)

Included

Studies included in review
($n = 200$)

Measurement tools included in review ($n = 155$)

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3.2 Identified measures and key features

3.2.1 Number of measures

A total of 155 measures were extracted from the 200 review papers (see Supplementary Materials Table S4) as well as the key design features of these measures (i.e., the length of measures, response scales, response formats, timeframes, valence of items and scoring procedures).

3.2.2 Length of measures

The majority of measures were brief and used 20 or fewer items (51.6%, *n* = 80). An additional 29.0% (*n* = 45) of measures used 21 to 40 items, and 12.3% (*n* = 19) of measures used 41 to 99 items. A small percentage of measures used over 100 items (3.2%, *n* = 5) while the number of items could not be found for 3.9% (*n* = 6) of measures.

3.2.3 Response scales

The majority of measures used Likert response scales (82.1%, *n* = 147), with considerable variability in the number of Likert points used. Specifically, 60.5% (*n* = 89) of measures included three to five-point scales, while 29.9% (*n* = 44) used six or seven-point scales. Only a small percentage (9.5%, *n* = 14) included Likert scales of ten or eleven points (none included eight or nine-point scales). In addition, 5.6% (*n* = 10) of measures included multiple Likert point scale formats. For example, the Quality of Life Inventory (QOLI; Frisch et al., 1992) asks participants to answer some items on a 3-point Likert scale and others on a 7-point Likert scale. See Supplementary Materials Table S5 for a summary of the response scales used by the included measures.

3.2.4 Response format

Likert response scales were used with various response formats, including frequency (e.g., never to always), intensity (e.g., not at all to very much), agreement (strongly agree to strongly disagree), and similarity (e.g., very much like me to not at all like me) (Clark & Watson, 2019). The observed Likert scales were coded for these response formats with 27.5% (*n* = 49) of scales measuring intensity, 28.7% (*n* = 51) measuring agreement, 25.3% (*n* = 45) measuring frequency, and 6.2% (*n* = 11) measuring similarity. A sizable number (*n* = 18, 10.1%) of included measures used mixed response formats. For example, the Subjective Happiness Scale (SHS; Lyubomirsky & Lepper, 1999) asks participants to rate intensity on some items and agreement on other items.

3.2.5 Timeframe

The measures varied on whether they asked respondents to answer items based on a specific timeframe or based on a general evaluation of their life. Nearly half of the measures (45.7%, *n* = 86) asked participants to answer items based on a general timeframe or "in general" while 36.7% of measures referenced a specific timeframe. Sixteen measures (8.5%) asked about more than one timeframe. For example, the Cantril Self-Anchoring Scale (Kilpatrick & Cantril, 1960) asked for the following timeframes, "In general", "Five years ago" and "Five years in the future". See Supplementary Materials Table S6 for a summary of the timeframes included in the measures.

3.2.6 Valence of items

Forty measures (25.8%) included only positively valanced items (i.e., "Some people are generally very happy") whereas only 1.3% (*n* = 2) of measures included negatively valanced items only (i.e., "Some people are generally not very happy"). Notably, 62.6% (*n* = 97) of measures included

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a mix of both positively and negatively valanced items, and 3.2% (*n* = 5) of measures included neither positively nor negatively valanced items (i.e., "How important is family to you?"). Items of eleven measures (7.1%) were not found and were not coded as such (Chang et al., 1994; Rodebaugh et al., 2007).

3.2.7 Scoring

Scoring procedures also varied across the included measures. Total and subscale scores were used by 39.9% (*n* = 87) and 38.5% (*n* = 84) of measures respectively, with the summing of scores being the most common procedure for calculating these scores. Other measures (10.1%, *n* = 22) made use of alternate scoring procedures such as computer scoring, individual item or slider scale values, or categorical scoring. Table S7 summarizes the scoring procedures used across measures.

3.3 Synthesis of original dimensions

The second aim of the study was to identify and synthesize the original dimensions included in the identified measures into a set of themes or synthesized dimensions. Of the 155 measures on positive mental health we extracted, a total of 410 unique original dimensions were identified. From these 410 dimensions, Life satisfaction was the original dimension that was most frequently included across measures (*n* = 8), followed by Meaning and purpose (*n* = 7) and Relationships (*n* = 7). A complete summary of these original dimensions and the measures to which they belonged can be found in Supplementary Table S8.

The 410 unique original dimensions could subsequently be recoded into the 21 themes or synthesized dimensions detailed in Table 1, with all coding reported in Table S8. Please refer to the methods section for a description of the process of dimension simplification and a description of the methodology for the creation of the synthesized dimensions. Table S9 demonstrates how often synthesized dimensions were covered across measures. Personal Relationships (*n* = 59) was captured most, while Engagement (*n* = 4) was captured least.

The interrelation between the synthesized dimensions and the umbrella concepts of wellbeing, quality of life, and resilience/coping is illustrated in Figure 2 (below). Each umbrella concept demonstrated features that were mostly representative of that individual domain rather than others (e.g., wellbeing [Self-Congruence, Engagement, and Spirituality], quality of life [Activities and Functioning, Physical health, Personal Circumstances, and Vitality], and resilience/coping [Avoidance, Problem-focused, and Emotion-focused Coping, and Calmness]). In other words, the dimensions that were more peripheral to the central notion of positive mental health. There were also dimensions that shared considerable overlap between the three umbrella concepts (in particular, Autonomy, Competence, Sense of Community, Happiness, Meaning and purpose, and Optimism), and could be considered more central dimensions of positive mental health.

4. Discussion

This umbrella review identified 200 systematic reviews of measures of positive mental health, with 155 measures included in the current review. Key design features of these measures were extracted and summarized. From these measures, 410 original, uniquely named dimensions of positive mental health were identified. After interrogating the focus of these original dimensions, a process of thematic analysis allowed them to be coded into a concise, conceptual framework of 21 themes or synthesized dimensions that captured the breadth of the original dimensions.

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Finally, the relationships between the synthesized dimensions and the 'umbrella concepts' of mental health (i.e., wellbeing, quality of life, resilience/coping) were mapped to demonstrate 'central' and 'peripheral' dimensions of positive mental health.

Figure 2. Concept map of the synthesized dimensions and their relationship to the mental health umbrella concepts of wellbeing, quality of life, and resilience/coping
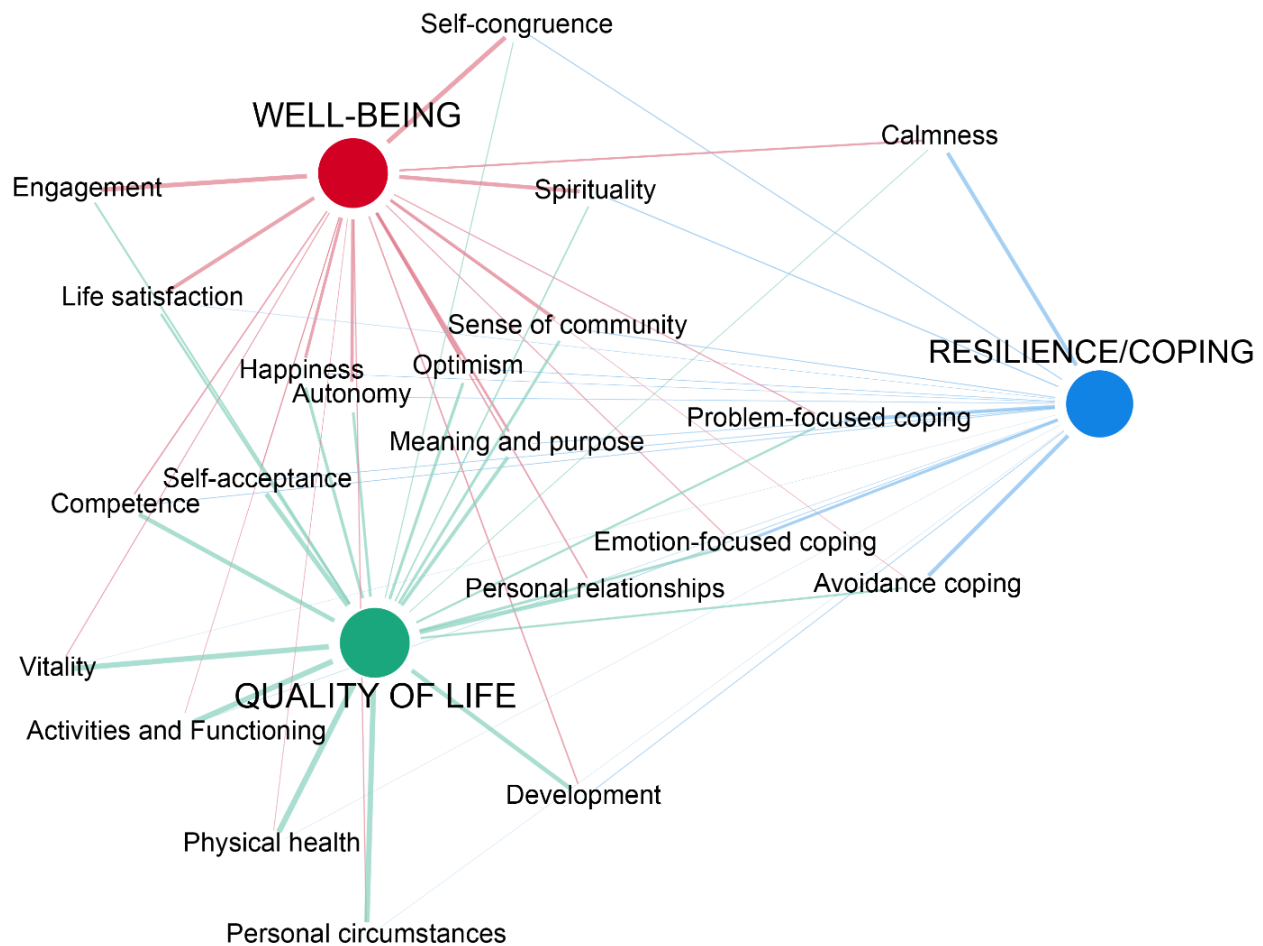
4.1 Design features of identified measures

The current review demonstrated considerable heterogeneity in the design of positive mental health measures, particularly in relation to response scales and response formats, affecting the ability to compare measures with one another and the performance of the measures itself.

The most consistent design feature across measures was the timeframe reference (i.e., how long participants are asked to reflect). Approximately half of the measures ask participants to consider their life in general (*n* = 86, 45.7%). This design-feature impacts the ability to make comparisons with many measures of mental illness or distress, which tend to assess different periods of a person's life rather than global evaluations (Kraiss et al., 2022). As Kraiss et al. (2022) concluded in their findings, it is hard to understand correlations between a measure of approach coping over the past few weeks with a measure asking for a lifelong retrospective (which might not even be possible).

There were significant differences in the construction of Likert scales used in the extracted measures, ultimately affecting their psychometric properties. Firstly, Likert Scales ranged from 3- to 11-point scales, with almost 50% using 5-point Likert scales or fewer. Ong et al. (2021) recently reported similar results in a review of measures of subjective wellbeing, with 55% of

measures using 5-point scales or fewer. Simms et al. (2019) suggested that more response options generally result in higher internal consistency and test-retest reliability, but that these benefits fade after six response options. The authors did not identify psychometric differences between 6 and 7 response options, offering an empirical argument that six is better in the interest of parsimony. Furthermore, Simms et al. (2019) concluded that maintaining only two to four response options produces suboptimal psychometrics, pointing to clear improvement areas when it comes to the development and improvement of positive mental health measures. Secondly, Likert Scales differed in allowing respondents to consider a neutral mid-point or to force respondents to decide on either response side. Studies suggest that by offering respondents a neutral mid-point, the interpretation of this response category can vary widely (e.g., unsure, neutral, etc.) adding ambiguity to respondents' outcomes and the subsequent accuracy of the measure (Krosnick & Fabrigar, 1997).

There were clear differences in whether measures used positively or negatively valanced items only, with a quarter of measures using the former and only a handful of measures using the latter. The majority of measures used both positively and negatively valanced items, which can introduce ambiguity as it is well-reported that some words, phrases and even constructs that may appear to be in opposition – e.g., pessimism vs optimism and feeling calm versus anxious – are in fact independent domains with distinct correlates and consequences (Chang et al., 1994; Rodebaugh et al., 2007; Scheier et al., 2021). This challenge in dimensionality is relevant for the results of mental health measurement, as it needs to be explicitly considered whether indicators are bi-polar or uni-polar (i.e., happiness to sadness, or happiness to no happiness). If a bi-polar dimension is only assessed with positively or negatively valanced items this will impact the measure's results (Schweizer & Schreiner, 2010). It may well be the case that each dimension ranges from optimal function to dysfunction, rather than from neutral to optimal function (Joseph & Wood, 2010). This confusion in dimension and measurement polarity attenuates scientific precision and leads to needless measurement error and inaccurate results (Cacioppo & Berntson, 1994).

The response formats that were used in measures were extremely heterogeneous, with most capturing intensity (i.e., how strongly I feel this), agreement (i.e., how much I agree with this statement), or frequency (i.e., how often I feel this). There is much less clarity on ideal versus suboptimal response formats compared to, for instance, the body of research on Likert-scale options. This is an aspect of psychometrics that has attracted attention in affective science, evidence suggests that knowing that a person experiences a high frequency of positive emotions offers more value in understanding mental health than intensity (Diener et al., 2009). While a clear consensus developed in the literature on positive emotions, no such gold standard exists in reference to other domains of positive mental health (e.g., self-acceptance, personal relationships). Attention to this aspect of measures will be important in future efforts to improve the sensitivity of mental health assessments (Schimmack, 2021).

Several interesting scoring procedures of measures of mental health emerged in the review. For example, procedures included: constructing composite scores by scoring a respondent's perception of the importance of a dimension with satisfaction with that specific dimension (Cummins, 1996), contrasting remembered versus experienced wellbeing (Hervás & Vázquez, 2013), as well as including one's judgment of how they have managed their life circumstances in their overall evaluation of satisfaction with life (Hagedorn, 1996). Like the frequency versus intensity discourse above, different scoring procedures raise challenges related to comparison with scales that adopted total and subscale scores. A similar issue has been demonstrated when comparing measures of optimism that ask people to respond to hypothetical situations

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(Attributional Style Questionnaire; Peterson et al., 1982) versus agreement with statements such as "In uncertain times, I usually expect the best" (Life Orientation Test; Scheier & Carver, 1985). When including multiple measures in a research design, we know that the predictive power of a construct is confounded by shared method variance between the independent and dependent variables (e.g., the Attributional Style Questionnaire might predict wisdom if the measure of wisdom asks people to respond to social dilemmas). Further, there are risks associated with the unjustified but common use of sum-scoring of scales which can negatively impact validity, reliability, and cut-off scores (McNeish & Wolf, 2020).

4.2 Dimensions of positive mental health

The second aim of this review was to map and synthesize the theoretical landscape of positive mental health by reviewing the dimensions included in identified measures of positive mental health (e.g., wellbeing, quality of life, resilience/coping). As evidenced, the current study identified 410 original dimensions included in 155 existing measures under the umbrella concepts of wellbeing, quality of life, and resilience/coping. These findings are clearly in line with previous research, demonstrating inconsistent use of language, conflation between terms, content creep, and unnecessary proliferation of measures in mental health, which ultimately hinders scientific precision and understanding (Ackerman et al., 2018; Baker & Intagliata, 1982; Dahl et al., 2020; Linton et al., 2016; VanderWeele et al., 2020).

The identification of literally hundreds of heterogenous measures and dimensions highlights just how little consensus there is when it comes to measures of positive mental health. Many measures were identified in reviews of multiple umbrella concepts, indicating the imprecise theory of positive mental health research in areas that may traditionally have been considered to be related but distinct, e.g., resilience versus wellbeing (Harms et al., 2018). For example, measures such as the SF-36 (Ware & Sherbourne, 1992) and EuroQol (Herdman et al., 2011) commonly appeared in reviews of both quality of life and wellbeing, and likely satisfy the definition of wellbeing for wellbeing researchers, and quality of life for quality of life researchers. Each of these measures assess a sufficiently broad set of dimensions of positive mental health to be considered to capture either quality of life or wellbeing. This example of wellbeing and quality of life highlights the commonality between the different umbrella terms and the related scientific fields (Skevington & Epton, 2018), but also demonstrates the issue of 'siloed practice'; a problem that may have been exacerbated by professional academic practice, as researchers identify with a particular umbrella concept of mental health, subscribe to specialized journals and conferences (e.g., Journal of Wellbeing Assessment, International Society of Quality of Life Research) and so forth.

The findings of this review showed clear evidence of the jingle-jangle fallacy (Marsh et al., 2019), i.e., similar terms were used to describe very different concepts (jingle; e.g., functioning could refer to general mental wellbeing, ability to perform daily activities, or performance of physical senses) and there were examples of the same concept described differently (jangle; e.g., activated positive emotions and vitality). However, while the overlap between these 410 original dimensions was often challenging at face-value, further investigation of their definitions and items facilitated consistent synthesis into a standardized set of positive mental health dimensions. This study, therefore, follows the examples of scholars in different psychological fields that have sought to simplify and integrate theory to advance practice and understanding in that field, such as behavior change research (Cane et al., 2012) or psychological therapy (Hofmann & Hayes, 2019). By doing so, this study has laid the foundation for a future taxonomy or framework for positive mental health, which incorporates the main basic tenets of positive

functioning while allowing room to expand and iterate the framework when research further matures.

To illustrate the relationship between each recoded dimension and the umbrella concepts of wellbeing, quality of life, and resilience/coping we displayed them in a concept map (see Figure 2). The illustration demonstrates that some dimensions are uniquely associated with each umbrella concept (e.g., Self-congruence to wellbeing, and Personal Circumstances to quality of life), while there is considerable overlap of dimensions between the three umbrella concepts. It is noteworthy that many more dimensions are shared between wellbeing and quality of life, than with resilience/coping. Among the most central dimensions between the three umbrella terms are Sense of Community, Optimism, Meaning and Purpose, Happiness, and Autonomy (Figure 2). It shows the core role that satisfaction of psychological needs is considered to play in establishing positive states of mind (Deci & Ryan, 2011).

The use of umbrella terms in the current study made for a broad definition of positive mental health. The Quality of Life umbrella terms introduce dimensions that are not usually included in definitions of mental health (i.e., Physical health, Personal circumstances, Activities and functioning), but undeniably impact an individual's mental health (Ohrnberger et al., 2017). Quality of Life research is more closely associated with 'holistic' models of health, such as Social Determinants of Health (Navarro, 2009), which may explain the more closely related dimensions illustrated in Figure 2. In contrast, Positive Psychology has been criticized for being overly focused on the individual rather than their circumstances and environment (Diener, 2009), which may explain the closer relationships between wellbeing and dimensions focused on the individual. Of note, recent conceptualizations of complete human flourishing in positive psychology literature have included material and physical wellbeing (Höltge et al., 2022). Resilience/coping was the umbrella term that introduced the most 'behavioral' dimensions (coping styles), aligning to broader notions of mental health literacy which include not only subjective experience but also expressions of capability (Oades et al., 2021).

4.3 Limitations

The current study was limited by our strategy to define positive mental health by the umbrella concepts of wellbeing, quality of life, and resilience/coping. The umbrella concept approach was considered the least arbitrary approach to identify a broad set of dimensions of positive mental health, and more systematic than merely searching for specific, well-characterized dimensions of positive mental health (e.g., happiness or meaning in life). As a consequence of incoherent nomenclature surrounding mental health research (Dodge et al., 2012; van Agteren et al., 2021), the search had to be limited to title only which introduces the risk of missing reviews that may have included the keywords in the abstract or keywords. Further, the search was limited to the English language and adult populations which will have missed measures in other languages and pediatric/adolescent populations. Despite limitations, the current study identified 200 review papers, and 155 measures of positive mental health, indicating something akin to saturation of identified measures. As an umbrella review, it is possible that there are measures that have been published in the literature which were not yet captured by systematic reviews (e.g., the Well-being Profile; (Marsh et al., 2020). It also meant that the research team was required to hand search key information on the measures, their definitions, and example items. While the information for almost all measures were found, older measures published in retired journals could not be located.

Synthesizing dimensions according to a deductive coding set was a challenge, as there was no clear set to begin with, i.e., one of the goals of this review was to lay the foundation for just

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that. We started with a list determined from previous work (Linton et al., 2016; Longo et al., 2018) and supplemented these with new dimensions if these came up more frequently within the identified measures (e.g., Sense of Community). Van Agteren et al. (2021) detailed a similar challenge when ascribing psychological interventions into 'broad intervention types', an issue that introduces unavoidable random error into the study as authors often use combinations of intervention components in their studies. A similar issue was observed in the current study, for example for the dimensions of Significance and Purpose. These were each predefined (Significance: "the feeling that what we do is worthwhile, rewarding and valuable"; and Purpose: "having clear goals, a sense of direction and a larger aim in life"; (Longo et al., 2018)). After extraction, it was however observed that most relevant dimensions obfuscated this difference and used a combined definition, leading to the creation of a merged dimension to be included in the final coding set.

4.4 Future research

This review has identified imperative directions for future research, primarily the feasibility of and need for the establishment of clearer definitions and conceptualizations of positive mental health terms including the widely used term wellbeing. Our work argues for the need to integrate multi-dimensional models into a consensus taxonomy of positive mental health. The current set of dimensions should by no means be considered final, but rather acts as a first step towards establishing a parsimonious taxonomy of positive and adaptive states of mental health dimensions. Like other taxonomies, frameworks and ontologies, we expect this list to be reviewed and improved as the literature matures, with required detail included, such as differentiating between subjective experiences and capabilities (Sen, 1993), and determining whether dimensions are inputs, outputs, and/or processes of positive mental health (Jayawickreme et al., 2012). Further research could investigate the relationship between these proposed dimensions of positive mental health (Höltge et al., 2022) and with symptoms of distress and dysfunction. It is likely that the absence or presence of these dimensions will have relevance for various clinical disorders or symptoms (Joseph & Wood, 2010; Scheier et al., 2021). Similarly, the relevance of these dimensions should be considered for other important outcomes such as longevity or sustainable development (Lutz et al., 2021), by investigating the predictive value of these dimensions in various disciplines where positive mental health is attracting attention (e.g., clinical psychology, economics, and health).

There is a clear need for interaction with the wider scientific community (e.g., via a Delphi study) to build on the existing list of dimensions and refine them. For example, various important drivers of our mental health, such as experiencing humor (McCreaddie & Wiggins, 2008) and being part of nature (Pritchard et al., 2020), were merged into our predetermined dimensions as a result of how they were operationalized within the measures. Concepts such as psychological flexibility or pro-sociality were not explicitly covered in the scales, which some argue to be important drivers or aspects of our mental health (Kashdan et al., 2020; Marsh et al., 2020), and are possible dimensions in future versions of a taxonomy. Similarly, we stuck to the traditional but broad conceptualization of problem-focused versus emotion-focused coping (Biggs et al., 2017), which were much more frequently operationalized in measures, while refraining from creating different dimensions for areas such as 'meaning-making', which feature as distinct areas in various coping models (Aldwin & Yancura, 2004). Future interrogation, iteration and refinement of the core dimensions will serve as a vital step towards the improvement of the current framework, particularly when it comes to more complex constructs such as coping.

The results presented here specifically apply to generic aspects of positive functioning. As such they do not apply to more specific areas such as work wellbeing (Leiter & Cooper, 2017). These context-specific states have a strong influence on our mental health and tend to be complex in their composition, being influenced by their own internal and external influences compared to our generic mental health (Disabato et al., 2019). As such they may warrant dedicated frameworks, rather than being subsumed by the context-free one presented in this paper.

There is also a clear need for research leading to gold standard measurement design approaches for mental health. This includes empirically derived guidance for decisions on the timeframe that a respondent would contemplate when answering questions (e.g., over the past two weeks versus a lifetime retrospective), the best way to style these responses (e.g., positively or negatively worded), and response formats (e.g., using hypothetical situations or agreement with statements). In the context of a validation and measurement crisis in psychology (Flake & Fried, 2020; Schimmack, 2021), it is vital that the measurement approaches we use are psychometrically sound.

In respect to clarifying the measurement landscape of mental health assessment, there is a rationale to go further than mental health dimensions and investigate the items used to inform them. It is likely that similar items are used across dimensions, further contributing to ambiguity and a lack of clarity (McElroy-Heltzel et al., 2019). For example, the item "I feel alone" is common in many measures, representing the dimension of personal relationships (i.e., WHOQOL) in some measures and spiritual wellbeing (i.e., Herth Hope Index (Nayeri et al., 2020)) in other measures. From the current review, we intend to develop item banks for each dimension, following the example set in other domains (Sellbom et al., 2020) and PROMIS (Cella et al., 2010). It is likely that the investigation of items will assist in the determination of uni-dimensional sub-dimensions, offering clarity to researchers on the atlas of contexts in which a person experiences even a single dimension of mental health. For example, within the broad dimension of personal relationships, there are a number of contexts ripe for evaluation including friendship, romantic partners, parents, children, and co-workers, and leadership in the workplace.

5. Conclusion

Ultimately, our findings demonstrate that to date there is little agreement in how to measure positive mental health, how these measures should be designed, or what dimensions should be included. This work aimed to consolidate the dimensions of positive mental health and propose a theory-derived framework that can be used to guide future efforts to enhance rigor in assessment. Our ongoing body of work aims to address these concerns by attempting to reach a consensus on the structure and components of positive mental health with an eye toward refined measures and stronger, durable science.

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Glossary

Umbrella Review	An umbrella review is a type of study that gathers findings from multiple reviews on the same topic to get a broader understanding. Think of it as a review of reviews, which helps summarize the best available evidence on a subject by looking at various studies already done.
Extensional Definitions	Extensional definitions explain what a term means by listing examples that fit the definition. It's like defining "tree" by listing maple, cedar, oak, rather than describing what makes something a tree.
Thematic Analysis	Thematic analysis is a method used in research to identify and organize patterns or themes within data. This means breaking down the information collected into big ideas or themes that help understand the data better, much like sorting different types of savoring or mindfulness approaches into categories to see what common opinions or issues emerge.

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