

Clinical Psychology

# Dispositional Mindfulness and the Process of Mindfulness Cultivation: A Qualitative Synthesis and Critical Assessment of the Extant Literature on the Five Facet Mindfulness Questionnaire (FFMQ)

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**Background:** Over the last decades, mindfulness has become an important concept and topic for many professions and interventional research. While the number of available self-report scales and empirical studies on the concept of mindfulness has increased in recent years, some questions regarding its theoretical underpinnings still remain.

**Objective:** The goal of this systematic review and qualitative synthesis was to investigate the distinction of cultivated and dispositional mindfulness. We focused on research with the Five Facet Mindfulness Questionnaire (FFMQ) as it is both comprehensive (building on and incorporating other important mindfulness scales) and widely used.

**Data Sources:** Journal articles and dissertations listed in Google Scholar, ProQuest, Scopus, Web of Science, and World Cat from January 2006 until January 2020.

**Review Methods:** 172 studies were identified and systematically analyzed in a two-step iterative qualitative coding framework with three main categories of interest: FFMQ and its facets, dispositional mindfulness, cultivated mindfulness.

**Results:** We offer a broad summary of the extant literature on the concepts of dispositional and cultivated mindfulness in terms of their definition, the practice of mindfulness, their state and trait aspects, and their assessment with self-report scales. Based on this evidence, inference on cultivated and dispositional aspects in the individual FFMQ facets is also presented and discussed.

**Conclusion:** Mindfulness cultivation is a process induced by mindfulness practice. Dispositional mindfulness functions as a baseline for this process. We argue that each FFMQ facet mixes cultivation and disposition, which might limit their usability in intervention studies or when comparing meditators and non-meditators. Future research should pay more attention on the cultivated and dispositional aspects of mindfulness, for which we offer venues and recommendations.

## Introduction

The history of mindfulness and its development into modern therapeutic programs appears to be well understood, and studies on the efficacy and mechanisms of mindfulness interventions are well represented in the literature and even on the rise in recent decades (Baminiwatta & Solangaarachchi, 2021; Lee et al., 2021). In their qualitative synthesis, Nilsson and Kazemi (2016) defined the “big five

of mindfulness” as awareness and attention, present-centeredness, external events, cultivation, and ethical mindedness (which is not properly defined or included in Western accounts of mindfulness). One key characteristic is *cultivation*, which the authors described as a “fostering” or “character development through mindfulness” (Nilsson & Kazemi, 2016, p. 188). In Western mindfulness research, cultivation describes the development of a skill, with the goal of preventing negative personal experiences (Nilsson

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& Kazemi, 2016). Skill development is one important goal of mindfulness interventions in clinical and nonclinical contexts, such as mindfulness-based stress reduction (MBSR; Kabat-Zinn, 1982), mindfulness-based cognitive therapy (MBCT; Segal et al., 2002), acceptance and commitment therapy (ACT; Hayes et al., 2009), or dialectic behaviour therapy (DBT; Linehan, 1993).

Hick (2009, p. 1) summarized some further nuances of the term *cultivation*: (a) developing self-awareness; (b) helping those within one's personal sphere (micropractice); (c) contributing to the greater good of personal group (mezzo-practice) and community (macropractice); and (d) positively affecting therapeutic relations between professionals and their clients. Given this potentially broad range of importance, mindfulness cultivation is, surprisingly, only seldom addressed in the mindfulness literature in any explicit way. This appears problematic as most recent papers are still (at least implicitly so) engaged with the cultivation of mindfulness as an outcome of interventions (e.g., Lee et al., 2021).

### The Definition of Mindfulness Features

The lack of a normative definition of mindfulness leads to ambiguities concerning its construct validity (Goldberg et al., 2019; Grossman, 2019; Tran et al., 2022; Van Dam et al., 2018). In the current literature, different terms are used to define various properties of the construct and there is still no consensus on central semantic or conceptual features (e.g., Hanley et al., 2016; Lutz et al., 2015; Van Dam et al., 2018).

*Dispositional mindfulness* is sometimes used as an equivalent to *trait mindfulness* (e.g., Tomlinson et al., 2018). It can be measured in populations naïve to mindfulness training or interventions at varying levels (e.g., Brown et al., 2007; Kabat-Zinn, 1990). However, *dispositional* and *trait* mindfulness are different and the interchangeable use of these terms might conflate their actual purpose (e.g., Rau & Williams, 2016). The term *dispositional* clearly states that this form of mindfulness is an *inherent human capacity* (an individual's stable tendency to be mindful in daily life) that naturally occurs in all individuals and is stable over time, if not explicitly trained (e.g., Baer et al., 2006, 2019; Brown & Ryan, 2003; Kabat-Zinn, 1990, 1994). Therefore, dispositional mindfulness is described to be independent of (formal) mindfulness training (Brown et al., 2007).

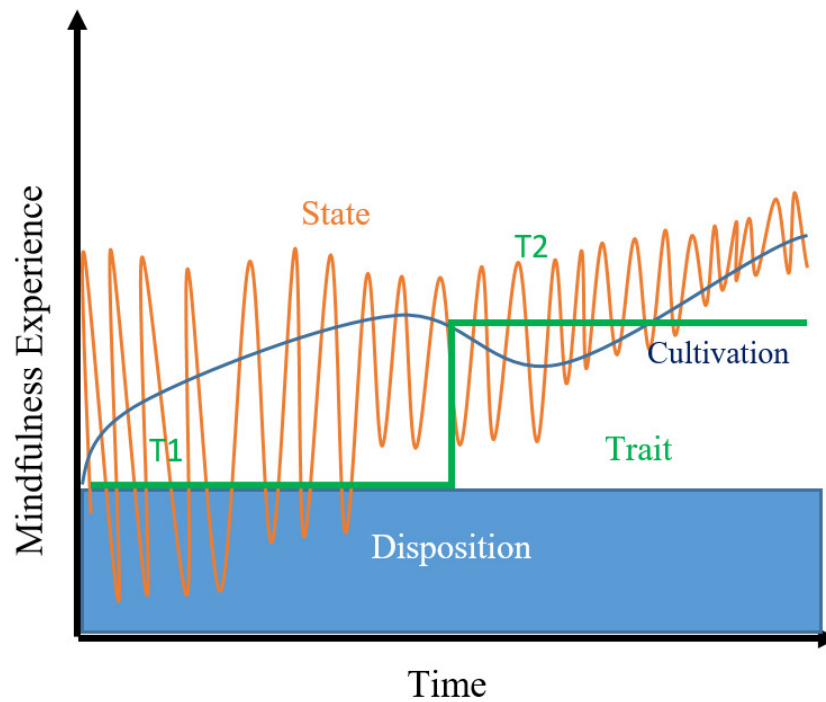
Many studies showed that *trait mindfulness* is not stable over time nor independent of mindfulness trainings (e.g., Carmody & Baer, 2008; Gu et al., 2016; Hanley et al., 2017). In fact, trait mindfulness might be best described as an individual's global self-description, or their general impressions/description of their ability to be generally mindful in daily life, which indicates inter-individual variability (e.g., Baer et al., 2006; Eliassen & Høifødt, 2017). In persons naïve to mindfulness, this description might very well be equated to *dispositional* mindfulness and research uses the dispositional aspects of mindfulness in differential psychology (e.g., concerning their connections and overlaps with personality; Tran et al., 2020) and clinical research (e.g., concerning bidirectional longitudinal associations be-

tween depression and dispositional mindfulness; Gómez-Odrizola & Calvete, 2020). In meditators and individuals with experience in mindfulness, their training effects influence their self-description (Lutz et al., 2015; Vago & Silbersweig, 2012). Therefore, trait mindfulness is more than pure disposition in these populations.

Research coined for the effects of mindfulness training the term *cultivated mindfulness* and for this process *mindfulness cultivation* (e.g., Rau & Williams, 2016). Cultivated mindfulness might be understood as a stratum that is added on top of dispositional mindfulness, when an individual actively participates in a mindfulness training (see [Figure 1](#)). While dispositional mindfulness provides the (solid) basis, cultivated mindfulness is a changeable component. Mindfulness cultivation is of key interest in (clinical) intervention research, which searches for mechanisms of action in mindfulness interventions (e.g., Gu et al., 2016; Tran et al., 2022).

Cultivated mindfulness is not identical to *state mindfulness*, which describes the active engagement in the process, and the mental state, of being mindful (in a given moment) itself (Brown et al., 2007; Tanay & Bernstein, 2013). It is seen as a highly volatile and modifiable process (e.g., Andrei et al., 2016) and the frequency with which one engages in mindful actions (viz. higher state mindfulness) is thought to increase with higher understanding of mindfulness (viz. higher cultivated mindfulness) (e.g., Cortazar et al., 2020; Quaglia et al., 2015). In experienced meditators, the volatility appears to decrease over time with continuous training, but it is currently unclear whether stability can be truly achieved (e.g., Parkinson et al., 2019; Shepherd, 2016; for neuroscientific evidence, see Hölzel et al., 2011). The role of mindfulness cultivation for state mindfulness via mindfulness training has also been highlighted by Lutz and colleagues (2015) who reject a model of mindfulness which incorporates only fixed state and trait aspects.

[Figure 1](#) provides a conceptual graphical representation, which shows the situation of measuring trait mindfulness at two points of time (T1 and T2) via self-reports, with a period of mindfulness training in-between. Trait mindfulness appears as a stable characteristic (T1) until measured again (T2; the self-reports themselves do not sufficiently differentiate between disposition and cultivation, for which we provide evidence in the next section and in the Results section of the current study). The individual disposition is represented by a constant level of mindfulness that is determined, inter alia, by personal and biological aspects (see Results). Cultivation on the other hand, is the outcome of mindfulness practice, a learning process which builds on the individual experience of mindfulness. This process might neither be linear nor include all aspects of mindfulness equally (e.g., Lorentz, 2012; Malinowski, 2008; Rau & Williams, 2016). State mindfulness may be represented as a volatile process that builds on the disposition of mindfulness, but even more so on its cultivation, which may make it easier to stay mindful and aware in the present moment (e.g., Campos et al., 2019). It is currently not fully understood which aspects of mindfulness are dispositional



**Figure 1. Dispositional Mindfulness and the Process of Cultivating Mindfulness in the Context of State and Trait Mindfulness**

*Note.* The blue area represents an individual's disposition of mindfulness. The process of cultivating mindfulness is represented as a dark blue line. The orange line represents volatile states of mindfulness. The measurement of trait mindfulness at two time points (before [T1] and after a mindfulness training [T2]) is represented by a step function encompassing the two time points.

or trainable and how the cultivation of mindfulness may affect specific mindfulness aspects.

Interestingly, many studies in the interventional context only use a trait perspective and trait measures of mindfulness to address pre to post-interventional changes in mindfulness (e.g., Bränström et al., 2011). However, this approach results in a momentary picture, which neither fully captures the stable components of mindfulness, nor the process of mindfulness cultivation (e.g., Lorentz, 2012; Malinowski, 2008; Rau & Williams, 2016).

### Self-Reported Mindfulness

One of the most popular ways to assess mindfulness is to ask individuals for self-reports of their (mindful) experiences. We are currently aware of 23 validated multi-item scales, which can be used for this purpose (see Table 1). All scales focus on the measurement of either trait or state mindfulness, yet no single scale directly addresses disposition or cultivation. This seems problematic as the idea of mindfulness as a stable (dispositional) trait does not incorporate mindfulness cultivation (Lutz et al., 2015). Moreover, many of these scales use phrases and wordings as are used in mindfulness interventions (e.g., “presented-centered”, “nonjudgmental”), which might interfere with the measurement of mindfulness cultivation (see Lutz et al., 2015; Van Dam et al., 2012). Participants might recognize these words during the survey and therefore might evaluate their ability to recognize familiar words, rather than their actual ability to use a specific mindfulness skill.

The identified self-report scales differ in their number of subscales, ranging from one to eight. Among the most-used measures are the Mindfulness Attention and Awareness Scale (MAAS; Brown & Ryan, 2003) and the FFMQ (Baer et al., 2006). The MAAS was cited 15,392 times on Google Scholar, whereas the FFMQ 8,321 times (Google Scholar as of July, 2022). Especially in clinical trials (RCTs) and in differential psychological research, the FFMQ appears to be the most frequently used scale (e.g., Gherardi-Donato et al., 2020; Roemer et al., 2020; Solé et al., 2020; Tran et al., 2022).

Based on an item synthesis of five independent mindfulness scales (MAAS, FMI, KIMS, CAMS, MQ; all scales are listed in Table 1), the FFMQ reduced an initial pool of 112 items to a 39-item scale. These items stem from both one-dimensional (e.g., MAAS) and multi-dimensional measures (e.g., KIMS) and therefore represent a mix of different concepts. Yet, the 39 items load on five facets that are compatible with the conceptualization of mindfulness in DBT (Linehan, 1993), featuring *what* skills (Observe, Describe) and *how* skills (Nonreacting to inner experience [Nonreact], Nonjudging of inner experience [Nonjudge], Acting with awareness [Actaware]) of mindfulness (Bednar et al., 2020; Eisenlohr-Moul et al., 2012). Observe is the ability to notice or attend to experiences; Describe is the ability to label these experiences with words; Nonjudge is the ability to not criticize and judge inner emotions, feelings and thoughts; Nonreact is the ability to perceive emotions, experiences and thoughts without a need to react to them; and Actaware is the ability to concentrate on tasks and ex-

**Table 1. Mindfulness Scales**

Abbreviation	Full Name	Authors	Number of facets	Intended to assess*
AAQ	Acceptance and Action Questionnaire	Hayes et al. (2004)	1	trait
AAQ2	Acceptance and Action Questionnaire 2	Bond et al. (2011)	1	trait
AMQ	Athlete Mindfulness Questionnaire	Zhang et al. (2017)	3	state
BCT	Breath Counting Task	Wong et al. (2018)	1	state
BIPM	Balanced Index of Psychological Mindedness	Nyklicek & Denollet (2009)	2	trait
BIMS	Balanced Inventory of Mindfulness-Related Skills	Van Dam et al. (2018)	4	trait
BMQ	Body Mindfulness Questionnaire	Burg et al. (2017)	2	state
CAMM	Child and Adolescent Mindfulness Measure	Greco et al. (2011)	1	trait
CAMS-R	Cognitive and Affective Mindfulness Scale-Revised	Feldman et al. (2007)	4	trait
CHIME	Comprehensive Inventory of Mindfulness Experiences	Bergomi et al. (2012)	8	trait
EQ	Experiences Questionnaire	Fresco et al. (2007)	1	trait
FFMQ	Five Facet Mindfulness Questionnaire	Baer et al. (2006)	5	trait
FMI	Freiburg Mindfulness Inventory	Walach et al. (2006)	2	trait or state (depending on time frame)**
KIMS	Kentucky Inventory of Mindfulness Skills	Baer et al. (2004)	4	trait
MAAS	Mindful Attention Awareness Scale	Brown & Ryan (2003)	1	trait
MEQ	Mindful Eating Questionnaire	Framson et al. (2009)	5	trait
MIPQ	Mindfulness in Parenting Questionnaire	McCaffrey et al. (2016)	2	trait
MSDQ	Mindfulness Strategies and Difficulties Questionnaire	O'Driscoll et al. (2018)	3	trait
MSMQ	Multidimensional State Mindfulness Questionnaire	Blanke et al. (2017)	3	state
PMS	Philadelphia Mindfulness Scale	Cardaciotto et al. (2008)	2	trait
SMQ	Southampton Mindfulness Questionnaire	Chadwick et al. (2008)	1	trait
SMS	State Mindfulness Scale	Tanay & Bernstein (2013)	2	state
TFMQ	Three facet Mindfulness Questionnaire	Truijens et al. (2016)	3	trait
TMS	Toronto Mindfulness Scale			
	State version	Lau et al. (2006)	2	state
	Trait version	Davis et al. (2009)	2	trait

Note. This is an updated list of Eberth's (2016) list of mindfulness scales.

\* Most measures could reasonably assess state or trait, depending on the utilized time frame.

\*\* Explicitly mentioned by Walach et al. (2006).

periences without distraction or acting on automatic pilot (Baer et al., 2006). Over 69 psychometric evaluations with original data in different countries, with different levels of mindfulness experience, and in diverse cultures have been

published over the years on the FFMQ (see sources marked with an \* in Supplementary Material 1), broadly confirming its psychometric characteristics, but not necessarily its facet and factor structure.

The FFMQ facets are assumed to represent mindfulness skills (Baer et al., 2006), which implies that training, and therefore the cultivation of mindfulness, should be reflected in facet scores. Further, it is assumed that these skills are measurable in trained individuals as well as individuals naïve to mindfulness training (Lutz et al., 2015). However, a clearer understanding on this issue and the probable distinction of facets, which are more sensitive to the cultivation of mindfulness, and facets, which represent more dispositional aspects of the construct, is needed. Furthermore, it remains unclear what, and how, other forms of non-mindfulness interventions and trainings increase mindfulness, and therefore FFMQ facet scores, as well. There is evidence that interventions and trainings which do not involve mindfulness are indeed associated with increases in self-reported mindfulness (e.g., tango classes, Pinniger et al., 2013, or psychiatric non-mindfulness treatments, Muirabi et al., 2020; for a review and meta-analytic evidence, see also Goldberg et al., 2019, and Tran et al., 2022).

Duan and Li (2016) proposed that the facets Observe and Nonreact are dispositional facets, whereas Describe, Non-judge, and Actaware are cultivated facets. The authors provided some evidence for this distinction with data of a Chinese student and community sample. Yet, this study did not deduct this assumption from theory and tested it with their data, but arrived at this result in a purely exploratory fashion only. It thus remains unclear whether these results are generalizable and valid. The current study therefore presents a qualitative synthesis (Timulak, 2014) of the extant literature on the structure and nature of self-reported mindfulness as measured with the FFMQ. We provide a comprehensive first overview on the evidence and interpretations on dispositional and cultivated mindfulness as measured (or measurable) with the FFMQ.

### Scope and Goals of this Study

Qualitative methods are currently largely underrepresented in mindfulness research, only 3% of the extant research used qualitative research methods (Lee et al., 2021). A systematic and interpretative qualitative analysis and review on the topic of cultivated and dispositional mindfulness thus appears to represent an important research desideratum. The scope and goal of this study was to provide a systematic interpretative account of cultivated and dispositional aspects of mindfulness in general, and with reference to the FFMQ – as one of the most widely used and comprehensive measures of mindfulness – in specific. By systematically searching, screening, and synthesizing the available literature on this topic, this qualitative analysis addressed the following research questions:

- What evidence and understanding of dispositional and cultivated aspects of mindfulness are presented in current mindfulness research? How do these definitions and interpretations of the construct influence the measurement of mindfulness and the interpretation of empirical results?

- Which FFMQ facets represent specifically either cultivated or dispositional aspects of mindfulness? Is there an order in learning mindfulness skills? This research question explored theoretical (post-hoc) justifications for the facet classification by Duan and Li (2016), but also tried to uncover theoretical justifications for alternative classifications.
- Is the FFMQ an appropriate measure for mindfulness intervention studies (i.e., post-interventional effects; e.g., Hawley et al., 2017) and diverse populations (i.e., groups with different levels of mindfulness experience; e.g., Carpenter et al., 2019), considering its capacity to capture cultivated mindfulness besides dispositional mindfulness?

## Methods

To address the research questions with evidence from diverse perspectives, we investigated a wide range of the extant literature and defined a-priori inclusion and exclusion criteria to fit the goals of this study. Studies were processed and analysed on basis of a two-step coding rationale and studies were synthesized and critically discussed with additional inference drawn across studies (Seers, 2015).

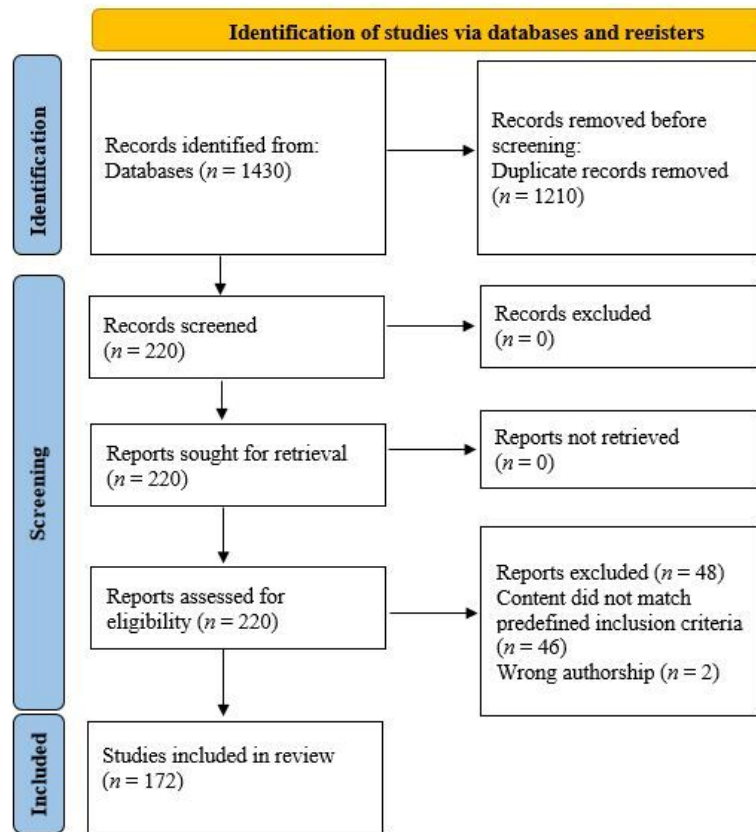
### Information Sources and Literature Search Strategies

A systematic literature search was conducted in the following databases: Google Scholar, ProQuest, Scopus, Web of Science, and World Cat. Keywords were defined a priori and consistently used in all databases: “Cultivated Mindfulness AND FFMQ”, “Dimension AND FFMQ”, “Dispositional Mindfulness AND FFMQ”, “Measure AND FFMQ”, “Questionnaire AND FFMQ”, “Scale AND FFMQ”, “Trait Mindfulness AND FFMQ”. If an article was not available online, authors were contacted via email. No limits were applied for language. The literature search was conducted from November 2019 to January 2020. Studies published from 2006 (after the initial publication of the FFMQ) until the last available date were included. There were no limitations according to publication type; preprints, comments, master and doctoral theses were all included in this qualitative analysis.

### Meta-Analytic Study Inclusion and Exclusion Criteria

We formulated the following inclusion and exclusion criteria: (1) the title indicated a context of mindfulness research (e.g., *Validation of Five Facets Mindfulness Questionnaire–Short form, in Spanish, general health care services patients sample*; Asensio-Martinez et al., 2019); or (2) the measurement of mindfulness was mentioned in the title (e.g., *Assessment of mindfulness by self-report*; Baer et al., 2019); or (3) the acronym “FFMQ” (or “Five Facet Mindfulness Questionnaire”) appeared in the title or abstract. Papers that featured one or more of the following aspects in the abstract were finally retained for analysis: (1) A differential psychological effect of mindfulness was described





**Figure 2. Prisma Study Flow Chart**

Note. 'Wrong authorship' means that the search engine/database listed a wrong person as the first author and the identified records turned out to be duplicates.

(e.g., differences between populations in the mean scores of mindfulness facets or validation studies) (e.g., *Investigating unique contributions of dispositional mindfulness facets to depression, anxiety, and stress in general and student populations*; Medvedev, Norden, et al., 2018); (2) specific facets of the FFMQ were mentioned (e.g., *Observing as an essential facet of mindfulness: A comparison of FFMQ patterns in meditating and non-meditating individuals*; Lilja et al., 2013); (3) the article provided information on the construct of mindfulness (especially concerning cultivation and disposition; e.g., *Dispositional mindfulness in daily life: A naturalistic observation study*; Kaplan et al., 2018).

### Data Extraction and Coding Rationale

All identified studies were individually saved for all databases and key words. The studies were then screened for duplicates and all duplicates were deleted (see Figure 2). All abstracts were screened and the remaining 174 included studies were then processed with MAXQDA 2018 (VERBI Software, 2019).

A two-step iterative coding framework was developed starting with three main categories of interest of this study: *FFMQ and its facets*, *dispositional mindfulness*, and *cultivated mindfulness*. For each main code, a coding rationale was developed (see next paragraph) that was consistently used across all publications. In a second step, subcategories were developed for each main category which helped detailing

the information. A coded piece of information was reassigned to a subcategory, if this provided a better content fit (e.g., for the main category *FFMQ and its facets*, all five FFMQ facets were individual subcategories and coded pieces of information referring only to a single facet were thus assigned to the more specific subcategories). The coded unit of information was usually a segment, consisting of a whole sentence or several words that were sufficient to interpret the context.

*FFMQ and its facets*: (1) the FFMQ is mentioned with additional information (exclusion: simple enumeration, e.g., list of scales); (2) a facet of the FFMQ is mentioned with additional information (exclusion: simple enumeration, e.g., list of facets); (3) exclusion: other scales (except for those with item overlap with the FFMQ, e.g., KIMS or MAAS). *Cultivated mindfulness*: The cultivation aspect of mindfulness is mentioned in the text, either explicitly (e.g., "cultivated mindfulness") or implicitly (e.g., the process of cultivation is described). *Dispositional mindfulness*: The dispositional aspect of mindfulness is mentioned in the text, either explicitly (e.g., "dispositional mindfulness") or implicitly (e.g., dispositional characteristics are described).

### Study Sample

174 studies were initially included and analysed. However, during this procedure, two studies were excluded with reasons (wrong authorship: these studies were found and

processed under an authorship, which turned out to be incorrect and identical to a different paper already included in the analyses), resulting in a final sample of 172 studies (see Figure 2).

All years from 2006 to 2019 were represented in the study corpus, with the majority of studies published in the year 2019. Generally, the number of included studies was larger for recent years (113 studies during 2015-2019), than earlier years (22 studies during 2006-2011). As a first author, Ruth A. Baer had the most publications in this study sample ( $k = 6$ ), Michael S. Christopher followed second ( $k = 4$ ). No single author appeared to over-influence this study sample. The most prominent (co-)author was again Ruth A. Baer, but with only ten appearances in total (see Supplementary Material 2).

The vast majority of studies was published in English ( $k = 161$ ; 94%), three papers were published in German, and two each in Latvian and Spanish. The first authors of the studies were from 31 different countries, indicating that the studies present evidence from diverse and different perspectives and backgrounds. While most of the papers originated from the US ( $k = 67$ ; 39%), Spain followed second ( $k = 11$ , 6%), and Italy third ( $k = 10$ , 6%) (a full list of countries of origin is provided in Supplementary Material 2).

Studies were published in 61 different outlets. *Mindfulness* was the outlet with the most studies ( $k = 41$ ), followed by *Personality and Individual Differences* ( $k = 9$ ), and *Assessment* ( $k = 8$ ) (for a full list, see Supplementary Material 2). There were 18 doctoral and 11 master theses. Only eight studies did not use the word “mindfulness” in their titles. Of these, two were not written in English and another two included the adjective “mindful”. “Five Facet Mindfulness Questionnaire” was mentioned in 61 titles, whereas “FFMQ” in 16 titles. “Dispositional mindfulness” was mentioned in 16 titles, “cultivated mindfulness” only in seven titles.

### Risk of Bias

Risk of bias was addressed via conducting an exhaustive literature search (Finlayson & Dixon, 2008). We actively searched for grey literature, like master and doctoral theses, and preprints to address our research questions systematically (Finlayson & Dixon, 2008). Interrater reliability was not addressed, as a single author conducted this review and subsequent coding in its entirety.

### Synthesis of Results

We present both quantitative (see Supplementary Material 2) and qualitative results. Qualitative results were arranged in two main sections: *Cultivated and dispositional mindfulness*, which includes results on the conceptual definition, the practice of mindfulness, and state and trait aspects. Based on these results and specifically devoted to the FFMQ, we then present a critical overview and conducted inference in the subsection *Inference on FFMQ facets based on qualitative results*. We added additional sources, which were not part of the original synthesis to this last chapter to increase rational and discuss our argument on the meta-

level. Sources are either recent discoveries, which exceeded our search period or from other fields of science (e.g. statistics). Detailed results, which more closely follow the above described coding rationale, are provided in Supplementary Material 1.

## Results

### Qualitative Results

In the following, we present some statements in detail, which appeared specifically important. Some quantitative results on word frequency and code frequency are presented in Supplementary Material 2.

### *Cultivated and Dispositional Mindfulness*

**Definition – Buddhist Origins.** Buddhist authors assume that a mindfulness *disposition* does exist from the very beginning of meditation as a primitive form of attention, but only after the completion of in-depth and constant training, which is strongly based on individual discovery and development (the Pali and Sanskrit term *bhavana* translates to *cultivation*), mindfulness is considered to be truly evident (e.g., Bucknell, 1993; Chiesa & Malinowski, 2011; Feng, 2017; Lorentz, 2012; O’Connor, 2015). Therefore, cultivation is an in-depth experience and understanding of mindfulness as a result of long-term training with large amounts of meditation practice (Analayo, 2003; Chiesa, 2012; Soler et al., 2014). Buddhism sees the purpose of mindfulness in the elimination of needless suffering and the development of a wholesome lifestyle (e.g., Hanley et al., 2014; Kuan, 2008; Mejia, 2013; Purser & Milillo, 2015), inseparably uniting ethical considerations and the function of concentration and remembering (*sati*) in the process of mindfulness cultivation (Chiesa, 2012; Christopher et al., 2014; J. M. G. Williams & Kabat-Zinn, 2011). So, neither attention, concentration, nor meditation training alone can cultivate mindfulness in a Buddhist sense (Purser & Milillo, 2015).

**Definition – Western and Clinical Approaches.** The holistic approach to mindfulness of Buddhism is not characteristic for the secular mindfulness trainings without any Buddhist roots (e.g., Hanley et al., 2014; Mejia, 2013; Purser & Milillo, 2015). However, from a Western perspective, studies agreed that *dispositional* mindfulness exists as a natural human capacity that varies across individuals (e.g., Abujaradeh et al., 2020; Baer et al., 2006, 2011; Burzler et al., 2019; Golley, 2017; Kaplan et al., 2018; Tomlinson et al., 2018) and is determined by multiple factors, ranging from the environment to genetics, conscious efforts, and behaviour change (e.g., Baer, 2019; Lal & Jayan, 2019; O’Connor, 2015). From a theoretical perspective, *dispositional* mindfulness might be linked to more veridical appraisals of ongoing experiences and a reduced tendency to evaluate the present moment, based on own expectations and beliefs (e.g., Hanley et al., 2016).

Generally, the terms ‘trait’ and ‘disposition’ are often used synonymously and interchangeable in the extant literature (e.g., Arthur et al., 2018; Campos et al., 2019). Some authors criticised this equation, as natural dispo-

sitions are defined in contrast to personality traits that might be formed by (later) environmental and personal factors (e.g., Rau & Williams, 2016). Still, mindfulness per se might be highly related to, or psychometrically overlapping with, personality characteristics (e.g., Weir, 2016; for respective evidence concerning the FFMQ, see also Supplementary Material 1). Some authors argued that mindfulness is less stable than personality (Eberth, 2016). Other authors argued that non-reactivity to inner experience might be a stable personality-like skill of mindfulness, while observing of inner experience showed only weak associations with personality (Johannes Alfons Karl & Fischer, 2019).

In their consensus definition, Bishop et al. (2004) described *dispositional* mindfulness as consisting of two dimensions: Orientation to experience and self-regulated attention. This model influenced the operationalization of mindfulness as a multi-faceted construct (e.g., Baer et al., 2006; B. Sahdra et al., 2016) and was later also shown to be applicable to the FFMQ as well (evidence of a two-factor higher-order structure among both meditators and non-meditators; Burzler et al., 2019; Tran et al., 2013, 2014).

Shapiro et al. (2006, p. 2009) described the *cultivation* of mindfulness as a natural human development process that increases the capacity for objectivity concerning internal processes. Lorentz (2012, p. 34) described *cultivated* mindfulness as “nonjudgmental, nonreactive awareness”. This high level of awareness is only attained when individuals are able to change their perception of a situation, which requires intensive training (Shepherd, 2016; Siegel, 2010). Many authors highlighted that the key characteristic of mindfulness is its trainability (e.g., Tang et al., 2015; Tran et al., 2014), and training usually increases scores in the various mindfulness measures (e.g., Brown et al., 2007; Shapiro et al., 2006). Thus, mindfulness trainings might initiate a process of mindfulness *cultivation* and many different forms of mindfulness training may foster this cultivation process (e.g., Brown et al., 2007; A. Cebolla et al., 2012). Simply stated, the purpose of mindfulness practice thus is to cultivate mindfulness (Johns, 2016; Shapiro, 2009). In this context, differences in biological-neuronal functioning are highlighted: Short-term practitioners are assumed to use either unconscious (“top-down”) or effortful emotion regulation strategies, while long-term meditators are able to use emotion regulation skills deliberate (“bottom-up”) and with less effort (Asensio-Martínez et al., 2019; de Barros et al., 2014). Individuals with a naturally high mindfulness disposition might show similar emotional reactions compared to individuals after a guided mindfulness exercise (Lin et al., 2016). Yet, even without meditation experience, older individuals experience themselves as more mindful than younger individuals (Brady et al., 2019; Lilja et al., 2011). This might be a result of a general human development process, as the cultivation of mindfulness improves one’s way of dealing with oneself and one’s own internal processes (e.g., Leinberger, 2012; Shapiro, 2009).

The empirical separation (e.g., in terms of measurement) of mindfulness *disposition* and *cultivation* is an unsolved problem of modern research (e.g., Rau & Williams, 2016; Tomlinson et al., 2018). Rau and Williams (2016) explicitly

criticized the assumption that mindfulness interventions may enhance dispositional mindfulness. They highlighted the separate roles of dispositional and cultivated forms of mindfulness, of which only cultivated mindfulness may develop in an individual. Without addressing the relevance and independence of both forms, the construct definition of mindfulness remains incomplete (Rau & Williams, 2016).

**Mindfulness Practice and the Role of Dispositional and Cultivated Mindfulness.** Mindfulness practice might promote mindful states and the regular cultivation of these states might, in turn, result in a stable cultivation of a mindful trait (e.g., Cortazar et al., 2020; Hanley et al., 2014; Petrocchi & Ottaviani, 2016; also see [Figure 1](#)). In general, meditators reported higher levels of trait mindfulness than non-meditators (Campos et al., 2019; Hanley et al., 2017). However, whether structural changes in the brain or rather in cognitive patterns drive the cultivation of mindfulness, which might then enhance the effects of mindfulness trainings in a possibly non-linear learning process (see below), is part of an ongoing discussion (Bodenlos et al., 2015; de Vibe et al., 2015; Eliassen & Høifødt, 2017; Gu et al., 2016; Hanley et al., 2014; Shapiro et al., 2011; Sørensen et al., 2018; Watson-Singleton et al., 2018).

For the process of mindfulness cultivation, various authors discuss linear versus non-linear increases after mindfulness trainings (e.g., Lorentz, 2012; Malinowski, 2008; Rau & Williams, 2016). Psychometric studies reported higher scores for mindfulness practitioners compared to non-practitioners (e.g., Moy, 2012) and for past-meditators (persons who discontinued regular meditation practice) compared to non-meditators (Pang & Ruch, 2019a). Meditators described a more natural access to mindfulness after intensifying their training (Lee, 2013). The goal of many mindfulness trainings is seen in the cultivation of the ability to respond mindfully in everyday activities and experiences (e.g., Baer et al., 2011) and stressful situations (de Barros et al., 2014). This might be accomplished with a variety of exercises – formal or informal – that strengthen the connection of mind and body (Benton, 2015; Campos et al., 2019). Other authors reported that formal and informal mindfulness practices are distinct constructs, as no relationship was found between mindfulness in sitting meditation and everyday mindfulness in non-meditators (Thompson & Waltz, 2007). Hanley et al. (2017) provided a speculative explanation for this: Formal mindfulness trainings increase overall trait mindfulness, while informal practices may increase only specific aspects (skills) of trait mindfulness. Accordingly, psychometric measures – like the FFMQ – that are designed to measure specific aspects of mindfulness were shown to be highly sensitive to increases only in specific (but not all) facets after MBSR programs (Blanke & Brose, 2017; Carmody & Baer, 2008), while informal practice (e.g., doing routine activities mindfully) had no significant effect on psychological variables at all (Kropp & Sedlmeier, 2019). Paradoxically, trainings and interventions without any explicit mindfulness content or reference to mindfulness appear to increase FFMQ scores as well (Xia et al., 2019), while even formal meditation might not affect all aspects or facets (Malinowski, 2008).



**Clinical Interventions and the Role of Dispositional and Cultivated Mindfulness.** Long-term meditation practice cultivates mindfulness skills and the development of such skills (e.g., concerning emotion regulation), in turn, can promote psychological well-being (Soler et al., 2014; Tran et al., 2014). Mindfulness training might help processing negative emotions from an outside and self-distant perspective (Shepherd, 2016). However, formal meditation might overwhelm emotionally disturbed individuals (Linehan, 1993) and is described as unnecessary for the cultivation of clinically relevant mindfulness skills (Hayes & Shenk, 2004; Mesmer-Magnus et al., 2017). Therefore, non-meditative mindfulness exercises were developed to train and cultivate mindfulness in clinical settings (e.g., Baer et al., 2019; Eisenlohr-Moul et al., 2012). However, participants still need to have a strong commitment to work on themselves, need to have high self-discipline, and still build on their direct experiences, which is seen as indication that mindfulness cultivation in clinical settings still matches the Buddhist perspective (Lee, 2013).

Baer (2019) argued that non-mindfulness clinical trainings might cultivate skills, such as awareness of thoughts and feelings and the orientation to experience, which are both theoretical and empirical factors of mindfulness (see Bishop et al., 2004; Burzler et al., 2019; Tran et al., 2014). Matched for session time, the cultivation of decentering and other mindfulness-related skills in non-mindfulness treatments approximates the cultivation of mindfulness in mindfulness-based interventions (Baer, 2019). A recent meta-analysis showed that – even so based on the same concept – mindfulness cultivation in practice might not always use the same techniques nor result in the same conceptual outcome (Matko et al., 2021 [not part of the original study sample]). Still, descriptions of actual clinical mindfulness trainings vary considerably across authors, who variously characterised them as: Forms of self-control exercises (Brown et al., 2007; de Barros et al., 2014; de Bruin et al., 2012); re-perceiving-trainings that lead to perspective shifts (Ausiàs Cebolla et al., 2018); processes of mental stability and clarity (Chiesa & Malenowski, 2011; Chiesa, 2012); a task of undoing (Christopher et al., 2009); a conscious attitude towards all kinds of experiences and mental processes (Schmidt & Vinet, 2015; Solem et al., 2015); a specific attention training (Lakatos et al., 2019); or even any exercise that brings an accepting attention to the present moment (Lee, 2013). Even well-known mindfulness-based interventions, such as MBSR and MBCT, differ in their conception of mindfulness cultivation (O'Connor, 2015). MBSR aims to cultivate awareness (Kabat-Zinn, 1990), whereas MBCT mindfulness and self-compassion (M. J. Williams et al., 2014). Yet, both try to cultivate *everyday mindfulness* (i.e., maintaining an open, accepting, and present-centered focus of attention during day-to-day life) as well (Baer, 2019). Mindfulness trainings thus may address a wide range of basic skills, which might be involved in a variety of psychological difficulties (Heeren et al., 2015).

Meta-analytic evidence suggests that meditation trainings more strongly increase attention and self-assessed mindfulness than MBSR, but lack further observable effects

on mindfulness with continued meditation practice (Eberth, 2016). Generally, there appears to be no effect on clinical outcomes if the type of mindfulness treatment or its dosage changes (Soler et al., 2014). Permanent within-person changes among mindfulness practitioners were reported as well (Peters et al., 2016); but with increasing mindfulness cultivation, it is generally easier for practitioners to stay attentive to the present moment resulting in smaller differences within and between experienced meditators (Sauer et al., 2013, see also [Figure 1](#)). Mindfulness trainings are linked to decreases in the frequency of negative mental states and might help individuals to enter more helpful states (Lee, 2013). This effect was also shown for short interventions (Gorman & Green, 2016). Yet, the regularity of practice might be more important than its duration (Thompson & Waltz, 2007). However, only few authors provided concrete numbers as to how long and with what frequency one needs to meditate to significantly increase both, mindfulness and mental health: Yet, eight weeks of regular meditative practice with 20 minutes of daily training might be sufficient (Soler et al., 2014).

**State and Trait Aspects of Dispositional and Cultivated Mindfulness.** Among non-meditators, trait mindfulness usually refers to a stable, enduring, dispositional form of mindfulness, whereas state mindfulness appears to be transient and changeable (Medvedev et al., 2017; Sturgess, 2012). However, this conceptual state-trait distinction was less sharp in more recent studies, where it is suggested that both aspects complement each other even among non-meditators (e.g., Burzler et al., 2019; Golley, 2017). These flexible conceptual approaches describe the practice of meditation as a cultivation of mindful states, which in turn drive the development of trait mindfulness and therefore allow for the complimentary use of state and trait theory (e.g., O'Connor, 2015). Both aspects may be enhanced through formal meditation (Campos et al., 2019) or mindfulness interventions (Chiesa & Malinowski, 2011). People who often engage in mindful behaviour (mindful states) are also more likely to be mindful in general (trait) and, vice versa, a general mindful behaviour might lead to more mindful engagement in the moment (e.g., Reffi, 2019; Tomlinson et al., 2018). Accordingly, strengthening state mindfulness during meditation practice is associated with higher trait mindfulness via the internalization of skills that are transferable across situations (e.g., Eberth, 2016; Johns, 2016; Kiken et al., 2015; Watson-Singleton et al., 2018).

Consequently, research tried to overcome the conceptual gap between state and trait mindfulness. Among experienced meditators, the transformative process of state skills into trait characteristics, and therefore mindfulness cultivation (see [Figure 1](#)), appears to be complete (e.g., Parkinson et al., 2019; Shepherd, 2016; for neuroscientific evidence, see Hölzel et al., 2011). Thus, independent investigations of state and trait mindfulness appears justified only among non-meditators but not among experienced meditators (Petrocchi & Ottaviani, 2016). However, the relationship between trait and state mindfulness might not be linear in the process of mindfulness cultivation,

which challenges the idea of a simple link (Thompson & Waltz, 2007). Also, in measurement theory, trait measures are designed to report stable aspects, whereas state measures report aspects sensitive to changes in mindfulness (Golley, 2017). In non-meditators, studies reported high intrapersonal variability of state and trait mindfulness, which may represent dispositional aspects in such populations as there is no (or only a very slow) process of cultivation (e.g., Tanay & Bernstein, 2013; Wheeler et al., 2017). In contrast, no such variability of state and trait mindfulness is observable among experienced meditators (Parkinson et al., 2019).

### ***Inference on FFMQ Facets Based on Qualitative Results***

**FFMQ General Results.** In the context of FFMQ studies, mindfulness is often referred to as a dispositional characteristic that should not fluctuate within a person unless it is explicitly cultivated (e.g., Eisenlohr-Moul et al., 2012; Tomfohr et al., 2015). Studies reported moderate-to-large changes in all FFMQ facets following mindfulness-based interventions (MBIs) and, in general, higher FFMQ scores in meditators than non-meditators (e.g., Bohlmeijer et al., 2011; B. K. Sahdra et al., 2017). There is an ongoing discussion on whether all five facets represent distinct mindfulness skills that can be cultivated separately, or one complex multidimensional mindfulness skill (Arthur et al., 2018; Oñate & Calvete, 2018). If the latter were the case, this would imply that (only) high scores on *all* FFMQ facets corresponded to a high level in (overall) mindfulness and vice versa (Lilja et al., 2013). This would also correspond with the definition of a reflective measurement scale, where changes in the latent dimension are reflected in *all* corresponding facets (Diamantopoulos & Siguaw, 2006). Yet, learning curves in individual trainings differ and participants may further vary in their disposition of mindfulness (Pang & Ruch, 2019b). On average, not all FFMQ facets appear to increase at the same rate (e.g., Taylor & Millier, 2016; Tran et al., 2014). Additionally, not all elements of mindfulness, including curiosity, awareness, and attention, do show the same (linear) increases (Christopher et al., 2014). However, this might not be evident in experienced meditators, as construct homogeneity – as captured with the FFMQ – increases with meditation experience (i.e., Observe loads on overall mindfulness only among meditators, but not among non-meditators; e.g., Baer et al., 2006; Carmody & Baer, 2008; Tran et al., 2013, 2014). A point of discussion is whether short-term interventions are effective for cultivating mindfulness, as its trait-like structure should only change gradually (e.g., Mattes, 2019; Sturgess, 2012; for a detailed FFMQ analysis, see Supplementary Material 1).

**Observe.** Observe was identified to have different meanings, scores, and structural properties in meditators and non-meditators. Already in the first validation study of the FFMQ, Observe did not fit well on an overarching (higher-order) mindfulness factor and had only weak correlations with the other facets among meditation-naïve college students (Baer et al., 2006). This finding has since been repli-

cated in numerous studies, and always in the context of samples and populations naïve to mindfulness training. Only among experienced meditators, Observe loaded well on higher-order mindfulness (Carmody & Baer, 2008). This is why many authors advised to not use the Observe facet with non-meditators (see Supplementary Material 1). Additionally, Observe has been noted for its weak connection to mental health, which could stem from its lack of items concerning emotional awareness (Medvedev, Norden, et al., 2018; Rudkin et al., 2018).

The available evidence thus does not support Duan and Li's (2016) model, wherein Observe is treated as a dispositional mindfulness facet only. On the contrary, the present synthesis suggests that the cultivation of Observe is what delineates meditators from non-meditators – especially also in light of this facet's associations with Nonreact and Nonjudge. High Nonjudge and Nonreact are reported to be indicative of an overall adaptive emotion regulation style and positive associations of Observe with mental health (e.g., Arthur et al., 2018; Carpenter et al., 2019). In contrast, low Nonjudge and Nonreact appear to be indicative of overall maladaptive emotion regulation and negative associations of Observe with mental health (e.g., Solem et al., 2015; Watson-Singleton et al., 2018). Experienced meditators are on average more likely to report an adaptive combination of high Observe, Nonjudge, and Nonreact than non-meditators (e.g., B. K. Sahdra et al., 2017). Results of person-oriented research further supported the important role of Observe in the process of mindfulness cultivation, as in cluster analyses of meditators and non-meditators, clusters with high scores in Observe also showed an overrepresentation of meditators, whereas clusters with low Observe scores showed an overrepresentation of non-meditators (Lilja et al., 2013). Therefore, Observe conceivably represents (slightly) different constructs in the contexts of dispositional and cultivated mindfulness, but – at the same time – also appears to interlink these two contexts.

This reasoning also provides a theoretical explanation for the misfit and misspecification of Observe among non-meditators in many previous studies (e.g., Asensio-Martínez et al., 2019; Baer et al., 2006; Duan & Li, 2016; Siegling & Petrides, 2016; Tomlinson et al., 2018; Van Dam et al., 2018). It is further compatible with the two-factor higher-order structure of the FFMQ, first proposed by Tran et al. (2013). In this conceptualization, the (relative) misfit of Observe in models with a single overarching mindfulness factor is captured by the correlation between the higher-order factors Self-regulated Attention, on which Observe loads specifically, and Orientation to Experience. The two-factor higher-order model fits equally well on the data of meditators and non-meditators, but the correlation of Self-regulated Attention with Orientation to Experience is stronger in meditating (Tran et al., 2014) than in non-meditating samples and, therefore, might also express effects of mindfulness cultivation (Burzler et al., 2019; Tran et al., 2013).

In summary, Observe appears to be an essential skill of mindfulness and the FFMQ in particular, concerning the

cultivation of mindfulness, as in most meditation trainings, participants are taught to centre their attention on their body and observe upcoming experiences and sensations (see Matko et al., 2021). Yet, to meaningfully compare Observe scores across different samples and time points, Observe needs to accurately disentangle disposition from cultivation (Bowman, 2014; Medvedev, Titkova, et al., 2018; M. J. Williams et al., 2014). The present synthesis suggests that this is generally not the case, from which two important practical implications immediately follow (see also Figure 1): (1) Only post-interventional gains among meditation-naïve participants probably reflect genuine increases of cultivated mindfulness in Observe; among meditators, dispositional and cultivated aspects of mindfulness are likely mixed. (2) Only within the same population (non-meditators or experienced meditators), Observe scores can be meaningfully compared, as only then these scores relate to the same (mix of) latent construct(s): Dispositional and cultivated mindfulness among experienced meditators and dispositional mindfulness only among non-meditators. However, meaningful comparisons might not be possible for different populations (meditators vs. non-meditators) or for different time points, if meditation-naïve populations received interventions, which successfully cultivated mindfulness. Also, varying degrees of experience might render comparisons among meditators equally difficult, as then dispositional and cultivated mindfulness might be conflated again.

**Describe.** Describe was criticized as a facet that does not capture the lived experience of most participants of mindfulness trainings (Christopher et al., 2014). Many authors thus doubt that Describe is an essential component of mindfulness, referring to different lines of argument (e.g., Bergomi et al., 2013; Ausiàs Cebolla et al., 2017; Christopher et al., 2014; Feng, 2017; O'Connor, 2015). First, Describe is about verbally referring to upcoming emotions and sensations. Therefore, it has to be related to both language ability and mindfulness (e.g., Golubev & Dorosheva, 2018; Hanley et al., 2017; Zhuang et al., 2017). Second, there exist meditation forms that do not explicitly address, and therefore train, the skill of describing sensations with words (e.g., MBSR), while others specifically do (e.g., ACT, DBT, Vipassana and Zen meditation; Leinberger, 2012). In psychological studies, Describe is assigned to the DBT-based *what* skills of mindfulness (e.g., Iani et al., 2017). These skills refer to actions in DBT-training (observing, describing, and participating). Yet, it seems possible to observe sensations and emotions in the absence of a verbal description. Even in DBT-understanding, observing has to take place before any form of describing can appear, rendering Describe as an auxiliary skill (Coffey et al., 2010). This might be one reason, why studies found no specific relationship of Describe with psychological symptoms, if modelled alone (e.g., Abujaradeh et al., 2020; Petrocchi & Ottaviani, 2016). However, in combination with high Nonjudge and high Actaware, this facet showed adaptive links with mental health outcomes (Samani & Busseri, 2019).

Among non-meditators (with no cultivated Observe), dispositional Describe might again be a fundamentally dif-

ferent construct compared to cultivated Describe in experienced meditators. However, detached from the context of mindfulness, both meditators and non-meditators could report both, difficulties or ease in verbally expressing sensations and emotions. Individuals, who participated in non-MBIs with a focus on emotion regulation and description should be expected to score high in the Describe (e.g., Murgabi et al., 2020; Xia et al., 2019). Not using explicit descriptions in mindfulness practice might cultivate Describe less than the explicit labelling of sensations and emotions. In the present form, this facet thus might neither usefully assess cultivated experiences of meditators nor dispositional experiences of meditation-naïve individuals.

**Nonreact.** Nonreact implies observing with a specific non-reactive stance in a way that it is positively related to emotional stability (e.g., Giovannini et al., 2014). The role of Nonreact as a moderator might be important for the efficacy of mindfulness concerning mental health outcomes. Based on correlational evidence, Nonreact in combination with high Observe and Nonjudge appears to indicate an adaptive and positive link with mental health outcomes; however, if Nonreact is low – and paired with low Observe – this combination appears to be maladaptive (e.g., Arthur et al., 2018; Carpenter et al., 2019; Eisenlohr-Moul et al., 2012). These specific skill profiles might reflect differences between cultivated aspects of mindfulness (adaptive combination) and dispositional aspects of mindfulness (maladaptive combination) in the context of mental health.

While non-meditators are limited to dispositional levels of Nonreact, meditators may actively cultivate Nonreact with their mindfulness training (e.g., Lecuona et al., 2020; Sampath et al., 2019). Accordingly, mindfulness trainings increase the relevance of Nonreact for the reduction of psychopathological symptoms, which marks the important role of Nonreact in the process of mindfulness cultivation (Heeren et al., 2015; Shepherd, 2016). Nonreact also plays a central role in the relationship of mindfulness to emotion regulation, as the facet is positively related to reappraisal and acceptance (Iani et al., 2019). Yet, some authors described a nonreactive stance only as a result of specific meditation practices (e.g., Vipassana), which indicates it might not be cultivated by all mindfulness interventions equally (Lilja et al., 2013; O'Connor, 2015; Tran et al., 2013, 2014; Watson-Singleton et al., 2018).

In the FFMQ's two-factor higher-order model, Nonreact loaded on different factors among meditators (Self-regulated Attention; Tran et al., 2014) and non-meditators (Orientation to Experience; Burzler et al., 2019; Tran et al., 2013). For meditators, the result of cultivating Nonreact might be best described as a genuine state of mind which allows meditators to naturally access a nonreactive stance in their daily lives (e.g., Iani et al., 2019). In contrast, studies report a lack of understanding and relatively low scores in Nonreact among non-meditators (Lecuona et al., 2020; Sampath et al., 2019).

Therefore, Nonreact could be an important facet concerning the cultivation of mindfulness, but faces the same limitations as Observe concerning the interpretation of its scores: Scores probably can only be meaningfully compared

within populations with a similar level of cultivation (e.g., meditators, non-meditators), but not across populations (meditators vs. non-meditators), because this conflates dispositional with cultivated mindfulness. Further, research should pay attention on meditation type when comparing the scores of meditators, as this might also influence the cultivation of Nonreact.

**Nonjudge.** Similar to Nonreact, Nonjudge is explicitly described as an outcome of meditation practice, as meditators are trained to accept thoughts, sensations, and experiences (Soler et al., 2014). This characterisation of Nonjudge contrasts with the definition of a purely dispositional trait (Falkenström, 2010). Again, the adaptive combination of high Observe, paired with Nonreact and Nonjudge, is positively associated with mental health outcomes (e.g., Arthur et al., 2018; Carpenter et al., 2019; Eisenlohr-Moul et al., 2012). Further, several studies have shown that Nonjudge is most strongly of all facets associated with mental health (e.g., anxiety and depression), controlling for the other facets (e.g., Baer et al., 2006; Carpenter et al., 2019; Petrocchi & Ottaviani, 2016).

In Buddhism, Nonjudge is more than acceptance and reflected in the concept of *equanimity*, which considers wisdom, freedom, compassion, and love (O'Connor, 2015). The contents of the FFMQ Nonjudge facet do not mention any of these concepts (Baer et al., 2006). However, several authors reported a substantial overlap of Nonjudge with the concept of self-compassion (i.e., being kind to oneself), as a non-judging person does not engage in self-criticism (Carpenter et al., 2019).

Similar to Nonreact, Nonjudge could be an important facet of mindfulness cultivation. Indeed, studies reported a temporal order in the process of mindfulness cultivation, in which Nonjudge precedes Nonreact (Johannes Alfons Karl & Fischer, 2019). Further, Nonjudge predicted mental health outcomes even two years after training, which suggests that the cultivation of Nonjudge has stable and lasting effects (Petrocchi & Ottaviani, 2016). Yet, we consider cultivated Nonjudge, and even more so, cultivated Buddhist equanimity, as different from Nonjudge in the absence of mindfulness training. In non-meditators, Nonjudge correlates negatively or zero with Observe even across cultures (e.g., Dundas et al., 2013; Michalak et al., 2016; Oñate & Calvete, 2018; Pang & Ruch, 2019a). Yet, in meditators, both facets correlated highly positively, probably indicating the effects of a cultivation process (e.g., Leinberger, 2012; Taylor & Milleer, 2016). Therefore, this facet, again, might not be clearly comparable across populations (e.g., meditators versus non-meditators). Further, studies reported problems with the Nonjudge items concerning scaling constraints (the five-point scale is not sufficient to differentiate between varying levels of mindfulness experience), which might make it impossible for participants to self-report their true level of nonjudgment (Pang & Ruch, 2019a). Yet, lacking conceptual reliability (between experienced and meditation naïve individuals), self-reported Nonjudge might not be useful for the assessment of mindfulness cultivation (e.g., measuring increases after training) either.

**Actaware.** When coupled with high levels of Nonjudge, high Actaware is theorized to decrease reactivity to emotional distress (Peters et al., 2016; Tomfohr et al., 2015). Individuals intentionally distract themselves from negative experiences when engaging in the present moment, which makes Actaware a form of emotional self-regulation (Spinhoven et al., 2017). Yet, even though Actaware is a facet of a *trait* mindfulness measure, its items predominantly refer to mindful *states*. In order to address trait mindfulness, participants are instructed to report their experiences with acting with awareness on a general level (Baer et al., 2006). This might be a difficult instruction for participants as many of the items relate to content that might fluctuate from moment to moment and to short and volatile situations of awareness. Yet, the main difference between state and trait mindfulness (see [Figure 1](#)) lies not only in the duration of relevant (mindful) experiences, but also their volatility: Whereas trait mindfulness refers to a stable general tendency, state mindfulness refers to each situation and can be much more volatile; especially among those with low levels of trait mindfulness. Actaware only measures the general tendency to engage in mindful states, but does not assess the actual volatility of engagement from moment to moment. Following meditation training (cultivation), the volatility (variance) of this engagement may decrease (see [Figure 1](#)).

This mostly unnoticed feature seems to suggest a special role of Actaware in the context of dispositional and cultivated mindfulness. Accordingly, some studies reported that Actaware might not be consistently related to meditation experience, especially in very experienced populations, like monks (e.g., Baer et al., 2008; Benton, 2015; Christopher et al., 2014). Other studies reported a lack of association between Actaware and Nonreact in non-meditators (Lilja et al., 2013; Watson-Singleton et al., 2018). Yet, at low levels, Actaware captures a disposition to act on autopilot; at higher levels, and probably particularly after cultivation, it measures the tendency to engage in conscious and deliberate actions (Peters et al., 2016; Tomfohr et al., 2015). In long-term meditators, ceiling effects have also been reported (Montero-Marin et al., 2016; Soler et al., 2014). Ceiling effects might indicate a particular consequence of the facet's reference to state (vs. trait) characteristics.

Two major points of concern were raised for the definition of Actaware in the FFMQ: (1) The two central concepts of Actaware, *attention* and *awareness*, are not meaningfully defined and remain undifferentiated in this facet (Blanke & Brose, 2017). This might provide one explanation why these two concepts showed no correlation among non-meditators (Siegling & Petrides, 2016). Also, the Actaware items require participants to report *lapses* of attention, as they are all reverse-scored; reporting lapses of attention might be a difficult task, especially for non-meditators (May & Reinhardt, 2018). (2) Of all five FFMQ facets, only the Actaware items do not refer to emotions and sensations. This might explain why studies reported a poor fit when Actaware is modelled on its own (Pelham et al., 2019) and poor separation of this facet from the other facets of mindfulness (Van Dam et al., 2018).

We conclude that Actaware might change with practice, but that this change might not be correctly reflected in its overall score, which only addresses the general tendency to engage in mindful states. Instead, Actaware might also need to assess the volatility of this engagement to accurately reflect higher levels and the cultivation of mindfulness. In measurement, Actaware might not fairly compare different populations (i.e., meditators and non-meditators) or different time points, with mindfulness trainings in-between, within the same population. Currently, Actaware addresses only the general tendency, but not the volatility, of engaging in mindful states. This volatility likely decreases with the cultivation of mindfulness and probably is the more informative aspect related to this construct.

## Discussion

### Summary of Results

This qualitative synthesis addressed the role of dispositional and cultivated mindfulness in the mindfulness literature from 2006 to 2020 and with particular reference to the comprehensive and widely-used FFMQ. We showed that the differentiation of dispositional and cultivated mindfulness is important in the contexts of both clinical and non-clinical mindfulness intervention studies and for differential psychology. Synthesizing the results from 172 studies, we further confirmed that training and therefore the process of cultivation is a central aspect of mindfulness (also see Baminiwatta & Solangaarachchi, 2021; Lee et al., 2021). All FFMQ facets appear to be affected by mindfulness cultivation. However, the FFMQ is no clear-cut measure of cultivated mindfulness: Its intended use lies in the assessment of trait mindfulness, which implies that dispositional aspects are relevant for, and inherent to, all FFMQ facets alike (Baer et al., 2006). These results are in contrast to Duan and Li (2016), who proposed that its facets are either cultivated (Describe, Nonjudge and Actaware) or dispositional (Observe and Nonreact).

Intervention studies might be predominantly interested in assessing cultivated mindfulness, whereas correlational studies either might be more interested in assessing dispositional mindfulness (among subjects with no meditation experience), cultivated mindfulness (among subjects with varying amounts of meditation experience), or both (if some subjects have no meditation experience and other subjects have varying degrees of meditation experience). Yet, the application of the FFMQ in such diverse populations and for such diverse research goals contrasts with the scale's ability to distinguish between dispositional and cultivated mindfulness. As a result, many extant studies reported difficulties in the assessment of mindfulness when comparing meditators and non-meditators. Especially Observe might not fit well with the other FFMQ facets to represent overall mindfulness in populations unexperienced with mindfulness and meditation. Yet, our synthesis points out that all FFMQ facets face difficulties in delineating dispositional from cultivated aspects. This in part results from a change of understanding of mindfulness and its skills with cultivation, but appears to be related to deeper con-

ceptual problems of currently-used self-report methods as well. Based on the present results, we conclude that cultivated and dispositional mindfulness need to be addressed explicitly in the assessment of mindfulness and that a refined understanding of trait and state aspects is needed.

### Need to Explicitly Address Cultivated and Dispositional Aspects in Mindfulness Scales

The present review highlights that available scales assess either only trait or state mindfulness, while only indirectly referring to the concepts of cultivation and disposition. So, do state and trait mindfulness already cover aspects of cultivation and disposition adequately?

### Addressing Cultivation and Disposition via the Measurement of Trait Mindfulness

Our synthesis showed that trait mindfulness is assessed in diverse situations and populations. Among individuals naïve to meditation or mindfulness training, who are (mostly) unaware of their mindful behaviour and did not cultivate mindfulness, trait mindfulness generally represents the variation in dispositional mindfulness of those individuals (e.g., Asensio-Martínez et al., 2019; de Barros et al., 2014). In contrast, experienced meditators and trainees of mindfulness are able to use “mindful” emotion regulation strategies more naturally and deliberately. They usually report higher values of trait mindfulness than meditation-naïve individuals as well (e.g., Parkinson et al., 2019; Petrocchi & Ottaviani, 2016; Reffi, 2019). We discuss and summarize from the results of the present study in the following, why increases in trait mindfulness still might not validly capture mindfulness cultivation.

Lutz et al. (2015) have already provided an in-depth discussion of this issue and stated that mindfulness training changes the phenomenological understanding of participants, which is not reflected in trait measures. The authors further argue that mechanisms of action and therefore the source of cultivation of mindfulness trainings might not be detectable with trait measures. Trait measures do not integrate the specificity and complexity of mindfulness cultivation on relevant processes (e.g., clinical vulnerabilities; Lutz et al., 2015). We want to add here that some of the mechanisms, which are discussed in the literature and which might be responsible for some of the beneficial effects of mindfulness, may actually be reflected in FFMQ scores to some extent. There is psychometric evidence of a factorial overlap of mindfulness, as assessed with the FFMQ, with some proposed mechanisms of mindfulness, such as attention regulation, body awareness, emotion regulation, and change in perspective on the self (Bednar et al., 2020). Still, the FFMQ might not be the best-suited instrument to assess those mechanisms themselves and may be at best only an indirect measure.

However, importantly, the memory of past mindful experiences and moments serves as the basis for any self-report of trait mindfulness. Participants have to report mindful and/or non-mindful situations of their past *on a general level*. Besides being potentially subject to reporting and



memory errors, this information is necessarily biased for the process of mindfulness cultivation, for which individuals should report *changes* in their perceptions, actions, or behaviours (e.g., Bishop et al., 2004; Germer, 2005; Tang et al., 2015).

Further, trait measures are defined to assess relatively stable characteristics that might slowly vary according to environmental and personal factors (Rau & Williams, 2016). Classic trait measures thus inseparably assess dispositional and cultivated aspects of mindfulness, mixing personal disposition with the outcome of mindfulness trainings and daily states with general memories (Rau & Williams, 2016). It is important to note that, on a conceptual basis, not every aspect of mindfulness cultivation automatically and instantly solidifies in a mindfulness trait, as this would contradict the assumption of a stable characteristic (Medvedev et al., 2017; Sturgess, 2012). Yet, the exact procedure for converting volatile cultivation processes into a stable trait has yet to be uncovered (see Lutz et al., 2015). By themselves, trait measures are simply not intended to measure short-term changes or a volatile process of cultivation following an intervention (for a meta-analysis in the area of preventive research, see Jayawardene et al., 2017). Several authors have already addressed the necessity to discriminate the outcome of mindfulness practice from the general construct and therefore independently focus on mindfulness cultivation processes and (dispositional) traits (Bishop et al., 2004; Brown & Ryan, 2003). Still, our qualitative synthesis showed that a large number of studies does not discriminate between these two important concepts and used trait measures to assess cultivation processes (also see Goldberg et al., 2021).

We propose here the view that trait mindfulness actually describes the sum of two independent (and principally separable) aspects of mindfulness: Its disposition *and* its cultivation (see also Ritchhart & Perkins, 2000). Trait aspects can only partially reflect a fixed component of mindfulness cultivation *at a specific* point of time (e.g., Lutz et al., 2015). Mindfulness cultivation might only be a meaningful predictor of trait mindfulness, if its changes are monitored *over a specific* time frame. Trait and cultivation are two different functions which are not of the same nature nor on the same conceptual level (not homomorphic to each other in a mathematical sense). Therefore, research needs to invest into developing assessment methods which enable a separate evaluation. Specific assessment methods capable of repeatedly measuring volatile processes over time (e.g., repeated measurements) might help to capture the essence of mindfulness cultivation in contrast to trait measures.

### **Addressing Cultivation and Disposition via the Measurement of State Mindfulness**

State measures of mindfulness are designed to assess the actual engagement in the present moment *at a specific* point of time (Tanay & Bernstein, 2013). This present-moment involvement is defined by the personal ability to engage in momentary mindfulness (a disposition that might vary from person to person) and might also be influenced by previous mindfulness cultivation (e.g., Sauer et al.,

2013). State measures do not address temporally stable elements, but focus on aspects that likely change from situation to situation, comparable to a pulse beat (Golley, 2017; see [Figure 1](#)). If the goal was to assess dispositional mindfulness in populations naïve to mindfulness training via a series of state measurements, one would expect a high volatility as those individuals have no trained and structured access to mindfulness engagement. Fittingly, we found no studies which tried to assess state mindfulness as a predictor for dispositional mindfulness in non-meditators or mindfulness-naïve populations. Yet, volatility, this central aspect of state mindfulness, should change with mindfulness cultivation, as with increasing mindfulness experience over time, the volatility of engaging in mindful states reportedly decreases (for a recent review, see Feruglio et al., 2021). So, the volatility of engaging in mindful states should correlate negatively with meditation experience also cross-sectionally. If volatility indeed shows this expected negative association with cultivation, it could then be used as a meaningful predictor of mindfulness cultivation in future studies and could help disentangling cultivated and dispositional aspects in trait mindfulness.

Studies additionally reported that mindfulness cultivation decreased the difference between state and trait measures in experienced populations (e.g., Parkinson et al., 2019; Shepherd, 2016). Prospective longitudinal studies could thus try to better grasp the cultivation process of mindfulness with a series of state measurements. State mindfulness could be repeatedly assessed either under highly standardized conditions (e.g., at different time points during the Trier social stress test; Kirschbaum et al., 1993) or with ambulatory assessment methods in daily life (see Trull & Ebner-Priemer, 2013). We argue that the multiple assessment of state mindfulness could provide a clearer picture of both the cultivation process of mindfulness and also of state mindfulness itself. At first glance, state measures only appear to address dispositional and cultivated mindfulness in an indirect way, as the interaction of both components determines the ability to engage in mindful moments. Yet, multiple assessments of state mindfulness could be accompanied by multiple assessment of trait mindfulness in longitudinal studies as well. This would allow to investigate the links between dispositional mindfulness (before the intervention) and cultivated mindfulness (during and after the intervention) in more detail. Accordingly, individuals with a higher level of cultivated mindfulness should be able to engage longer and with less effort in mindful presence than mindfulness-naïve individuals (e.g., Swift et al., 2017).

Recent studies have already used state measurements to assess mindfulness trainings (e.g., Rowland & Wenzel, 2020), but not with the goal of correlating volatility with mindfulness experience. Clearly, this line of research should be intensified and utilized for the investigation of cultivated versus dispositional aspects of mindfulness. With modern techniques like smartphones, ambulatory assessment and intensive measurement (i.e., multiple measures of the same person; e.g., Rush & Hofer, 2014) are easily available. Statistical methods like latent growth curve

modelling (e.g., Kiken et al., 2015) could then be beneficially used to investigate such data.

### **The FFMQ and Dispositional and Cultivated Aspects of Mindfulness**

As derived for trait measures on a general level, we argue that the FFMQ measures dispositional mindfulness only among non-meditators. Non-meditators scoring high in FFMQ facets thus appear to have an innate high disposition in these mindfulness skills, reflecting “naturally” high mindfulness traits (e.g., Ardenghi et al., 2020). A high trait indicates that a person remembers and reports utilizing (a combination of) mindful skill(s) in daily situations on a regular basis. But does this (probably isolated) high skill represent a mindful person? Some authors argue that only random changes in mindfulness skills and slow increases across individuals’ life spans can be expected among non-meditators (e.g., Lilja et al., 2011; B. Sahdra et al., 2016). More research is needed here in the future.

A further specific challenge for the FFMQ – as a measure of dispositional mindfulness – also appears to be its reference population: The measure was validated with US student samples, mostly naïve to mindfulness practice (Baer et al., 2006). This student population might be psychometrically problematic as a reference for older adults (Carpenter et al., 2019), diverse cultures (e.g., Haas & Akamatsu, 2019; Raphiphatthana et al., 2019, and populations with other educational backgrounds (e.g., Bränström et al., 2011; Iani et al., 2017). That is, there is a need for reference data for other populations as well and a need for studies, which investigate the measurement properties of the FFMQ across socio-demographically different samples.

Unexpected for a trait measure, the FFMQ seems to be generally sensitive to changes in mindfulness skills, for example in clinical samples (e.g., Baer et al., 2019; Watson-Singleton et al., 2018) and among participants with very low meditation practice (Goodall et al., 2012). In contrast but expected, most studies showed that individuals experienced in mindfulness have high scores in most FFMQ skills (e.g., Carpenter et al., 2019; Hawley et al., 2017; Jensen et al., 2019; Korinek et al., 2019). This suggests that these individuals deliberately use adaptive combinations of mindfulness skills in daily situations. Thus, FFMQ studies reported the ability to observe, without judgment or reactivity, as an adaptive combination in experienced meditators (e.g., Asensio-Martínez et al., 2019; Carpenter et al., 2019; Jensen et al., 2019; Pang & Ruch, 2019a). Paradoxically, trainings and interventions without any explicit mindfulness content or reference to mindfulness appear to increase FFMQ scores (and mindfulness skills) as well (see Tran et al., 2022; Xia et al., 2019), while even formal meditation might not affect all facets alike (Malinowski, 2008). This appears specifically problematic when the construct of mindfulness is modelled with a one-factor higher order reflective measurement model. It is a necessary condition for this type of model (see Diamantopoulos & Siguaw, 2006) that all skills (factors) increase equally as a result of changes in the higher-order factor.

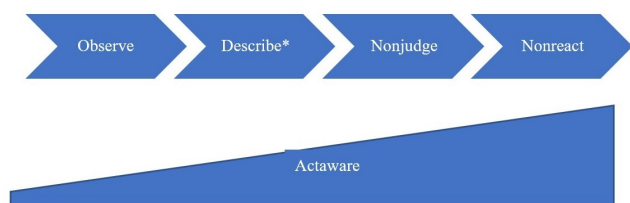
The reflective measurement model was exclusively used in structural analyses of the FFMQ from its inception on, starting with Baer et al. (2006), but also for all its predecessors (i.e., the scales the FFMQ built on). The latent overarching factor of mindfulness is reflected in five skills, and each skill is again reflected in its items. Skill scores should be high (controlling for reverse-scored items) when skill levels are high, and low when skill levels are low (Diamantopoulos & Siguaw, 2006). If cultivation entails changes in these skills, this must be reflected on the item level as well. A recent generalisability theory analysis by Truong (2020) showed that the FFMQ items indeed vary in the interaction between person, item, and occasion. This variation resulted in a bad performance for the measurement of state changes and trait characteristics, but might also influence the ability of the FFMQ to predict mindfulness cultivation (Truong et al., 2020).

A further underrepresented area in research on the FFMQ (but, more generally, also other mindfulness scales) is how specific mindfulness intervention and trainings cultivate mindfulness. A recent review showed that there exist at least 50 different basic meditation techniques, extracted from more than 300 specific meditation forms (Matko et al., 2021). This raises the question of how only five mindfulness skills can grasp the cultivation of all these diverse aspects. Reasons for cultivating mindfulness on basis of these meditation techniques might be very different: Some are religious practices, others focus on mindfulness in daily live, whilst others were developed to help clinical populations (Matko et al., 2021). On a biological level, numerous studies report differences in neuronal activity when comparing different meditation techniques (e.g., Acevedo et al., 2016; Braboszcz et al., 2017). It is still not known how the cultivation of skills generalizes across situations and populations and finally manifests in an individual.

### ***A Model of Mindfulness Cultivation on the Basis of the Individual FFMQ Facets***

As discussed above, at least some aspects of mindfulness cultivation might be captured with the FFMQ. If participants engage in training and start cultivating mindfulness, fundamental changes in their understanding of mindfulness may arise. This is expressed in an increase in the individual mindfulness facets and a different pattern of intercorrelations of these facets in mindfulness-experienced populations, compared to meditation-naïve populations (e.g., Burzler et al., 2019; Tran et al., 2014). Building on this and based on our qualitative synthesis, we now provide a model of mindfulness cultivation on the basis of the individual FFMQ facets in [Figure 3](#). This model could be beneficially used in research with the FFMQ, alongside above-mentioned multiple assessments of state mindfulness.

From the five the facets, Observe appears to be the best-investigated facet; at least, it was most frequently coded in the present analysis. This central skill (see Matko et al., 2021) develops first in the process of mindfulness cultivation as it is linked to basic body-centred attention practices (closely related to mediation and mindfulness exercises). Only after development of this basic skill, the mindful use



**Figure 3. The Process of Mindfulness Cultivation in Terms of the FFMQ Facets**

Note. \*Might not be part of every form of mindfulness training.

of the more complex *how* skills, Nonjudge and Nonreact can develop (Eisenlohr-Moul et al., 2012). This view might be criticized as to some authors mindfulness relates to being observant and observing is not seen as a simple skill for cultivating mindfulness (e.g., Feng, 2017; Korinek et al., 2019). Yet, the cultivation process from simple observing to mindful observation still remains to be investigated in more detail than it can be done with simple pre-post study designs. Describing as a mindfulness skill is not part of all meditation and mindfulness practices, but it plays an important role as an auxiliary skill in emotion regulation and develops as an early and basic process, if it is trained in mindfulness interventions (Chen et al., 2021; Coffey et al., 2010). Yet, only after being able to observe (and possibly describe) feelings and sensations, one may develop a mindful and accepting attitude towards these experiences. This is captured in Nonjudge, which precedes the behavioural component of Nonreact (Johannes Alfons Karl & Fischer, 2019). Nonreact seems to be an advanced skill to which all other mindfulness skills are necessary preconditions. Only after having observed (and possibly described) a stimulus, one can choose not to judge its valence and stay neutral. It then involves a further step to decide not to react to it. This is why some authors describe Nonreact as a genuine state of mind (Iani et al., 2019). Nonjudge and Nonreact are both also described as outcomes of mindfulness practice, which suggests a late role of these facets in the process of mindfulness cultivation.

The ability not to act on autopilot, which reflects the component of Actaware, is difficult to integrate into this model. Only few studies provided specific statements for this facet. This might be related to its item contents, which only describe the ability to be (not) distracted and (not) to automatize behaviours (in contrast to the ability to pay attention and be aware of the present moment; Baer et al., 2006). Yet, in the context of cultivation, Actaware is taught within the first moments of most mindfulness trainings, as participants are advised to consciously focus on the present moment and behave aware and attending (e.g., Kabat-Zinn, 2012). Sustaining this awareness and attendance over longer periods of time is a difficult task which requires intense training. Like the other skills, Actaware is usually not assessed repeatedly during the course of intervention research, but only pre and post-interventional. This results in a non-continuous assessment of its state characteristic, which is comparable to the concept of flow (e.g., Dane, 2015; O'Connor, 2015). Thus, especially experienced

practitioners might report their non-mindful experiences more critically, especially as state and trait concepts might be inseparable in experienced meditators (e.g., Hölzel et al., 2011; Parkinson et al., 2019; Tanay & Bernstein, 2013; Wheeler et al., 2017). The repeated assessment of Actaware during the course of an intervention may therefore be needed to better understand its dynamic and evolution.

## Conclusion

The present qualitative synthesis leads to the conclusion that all skills represented in the FFMQ facets appear to be cultivable, but that dispositional and cultivated aspects of mindfulness are neither well-defined nor clearly separated (cf. Duan & Li, 2016). As a measure of trait mindfulness, this is not a problem of the FFMQ per se, but it poses problems specifically in intervention settings. Here, both dispositional and cultivated aspects need to be clearly distinguished. Thus, the separation of cultivated and dispositional mindfulness in assessment appears to be mandatory for future research. Also, Buddhist teachings and clinical interventions may differ in their approaches, views, and goals (Anālayo, 2019). To better understand cultivation, research therefore also needs to attend to the specific goals of the various mindfulness interventions, as they might determine which aspects or skills will be cultivated. Only then an appropriate assessment of these skills can be provided.

Furthermore, the assessment of mindfulness ideally should be sample invariant, especially concerning meditators and non-meditators (Bowman, 2014; Medvedev, Titkova, et al., 2018; M. J. Williams et al., 2014). A recent study (Bednar et al., 2020) showed that this might indeed be the case for FFMQ scores, but not necessarily its items (see Van Dam et al., 2009, 2012). Mindfulness-naïve individuals might not fully access and understand the FFMQ item contents and wording concerning their interactions and interrelationships in representing mindfulness. Cultivation likely alters this access and enables individuals to better understand these skills and reflect on their interactions and interrelationships in the intended way (Bravo et al., 2018). Yet, highly experienced meditators might not consciously or knowingly perceive their experiences as mindful anymore, because this has already become “second nature” to them and needs no further conscious effort. Developing a sample-invariant mindfulness measure (down to the item level) thus still appears to be an important, but likely challenging, research desiderate.

Lastly, the very concept of mindfulness poses difficulties for the assessment of the efficacy of mindfulness interventions, as it also cannot be cleanly separated from mental health (Nilsson & Kazemi, 2016). Accordingly, a recent meta-analysis of 146 randomized controlled trials found that self-reported mindfulness not only mediated (i.e., statistically explained) the efficacy of mindfulness interventions, but also of other, non-mindfulness, control interventions alike (Tran et al., 2022). Objective measurements, such as behavioral and physiological measures (Goldberg et al., 2021), but also the explicit separation of dispositional and cultivated mindfulness could probably help in solving this conundrum as well.



## Limitations

The literature search was based on an a priori developed search strategy and key word list, which helped to structure this process, but was performed by one author only. This may have affected study detection and selection. All evidence was based on the aggregated results of other authors; in qualitative syntheses, this process of aggregation might lead to an alternative interpretation of some results than intended by the original authors themselves (Timulak, 2014). As text segments were the unit of analysis, this might have also resulted weaker or stronger interpretations. Finally, this qualitative synthesis focused on the FFMQ. Even so the FFMQ is a comprehensive mindfulness scale, there are currently at least 22 other mindfulness scales available. As some of these scales have larger shares of their item contents in common with the FFMQ (e.g., KIMS, MAAS), reported results likely (partially) apply to these other scales as well, but not necessarily on all their facets and items alike. Research on scales the FFMQ does not share its items with is still needed.

## Future Research

More research on how to measure mindfulness cultivation explicitly is currently required. The present synthesis provided some venues for future research (e.g., multiple assessments of state mindfulness in the course of cultivation to assess its volatility), but the addition of non-self-report outcomes, such as behavioral and physiological measures (Goldberg et al., 2021), may be further beneficial in this endeavour. Especially the comparison of cultivation in experienced meditators and non-meditators is an unsolved problem with the currently available scales. While studies reported differences in cognitive flexibility (Müller et al., 2016), a crucial aspect appears to be the definition of a period, within which mindfulness cultivation may sufficiently alter cognitive processes. Even though there is some evidence that 27 hours of MBSR practice are required to effectuate changes in amygdala volume (Kral et al., 2022), the minimally required length of this period still needs more research.

The Describe facet should be investigated for its ability to measure specifically mindful describing in contrast to (other) forms of emotion regulation and expression. Populations who have had experience with some non-mindfulness interventions (e.g., cognitive behaviour therapy) could be informative here to test item content and its discriminative validity vis-à-vis mindfulness. Further, an effort should be made to create positively worded (instead of the current reverse-coded) items for the Actaware facet and it should be investigated whether these could indeed better grasp the

cultivation of Actaware. Yet, we also recommend investigating alternative response formats for the items of this facet (but probably for other FFMQ items as well), which also include ratings concerning the volatility of engaging in mindful states (where applicable according to the item contents). Such ratings could provide an economic and easily applicable option for the assessment of cultivated mindfulness in future studies, if they show validity vis-à-vis multiple assessments of state mindfulness for comparison. A split of Actaware into two facets, as suggested by a recent cross-cultural psychometric study (Johannes A. Karl et al., 2020), should also be followed up.

Finally, future research should also investigate other mindfulness scales for their ability to distinguish dispositional from cultivated mindfulness; especially scales, which are more independent from the FFMQ concerning their item content than its predecessors. There are probably currently less-known measures, which are better suited for distinguishing dispositional from cultivated mindfulness than the widely used FFMQ.

## Contributions

Matthias A. Burzler (MAB) and Ulrich S. Tran (UST) contributed to this paper. MAB designed the study; carried out the literature research, the data analysis, and the interpretation; and wrote the first paper draft. UST supervised all processes and revised the draft critically for important intellectual content.

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## Competing Interests

No competing interests exist.

## Supplemental Material

This paper comes with two supplementary materials: Supplementary Material 1 and Supplementary Material 2.

## Data Accessibility Statement

All sources of the literature search are listed in Supplementary Material 1.

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## References

- Abujaradeh, H., Colaianne, B. A., Roeser, R. W., Tsukayama, E., & Galla, B. M. (2020). Evaluating a short-form Five Facet Mindfulness Questionnaire in adolescents: Evidence for a four-factor structure and invariance by time, age, and gender. *International Journal of Behavioral Development, 44*(1), 20–30. <https://doi.org/10.1177/0165025419873039>
- Acevedo, B. P., Pospos, S., & Lavretsky, H. (2016). The neural mechanisms of meditative practices: Novel approaches for healthy aging. *Current Behavioral Neuroscience Reports, 3*(4), 328–339. <https://doi.org/10.1007/s40473-016-0098-x>
- Analayo, B. (2003). *Salipattana, the direct path to realization*. Windhorse Publications.
- Anālayo, B. (2019). The emphasis on the present moment in the cultivation of mindfulness. *Mindfulness, 10*(3), 571–581. <https://doi.org/10.1007/s12671-018-1074-1>
- Andrei, F., Vesely, A., & Siegling, A. B. (2016). An examination of concurrent and incremental validity of four mindfulness scales. *Journal of Psychopathology and Behavioral Assessment, 38*(4), 559–571. <https://doi.org/10.1007/s10862-016-9546-x>
- Ardenghi, S., Rampoldi, G., Pepe, A., Bani, M., Salvarani, V., & Strepparava, M. G. (2020). An exploratory cross-sectional study on the relationship between dispositional mindfulness and empathy in undergraduate medical students. *Teaching and Learning in Medicine, 33*(2), 154–163. <https://doi.org/10.1080/10401334.2020.1813582>
- Arthur, D., Dizon, D., Jooste, K., Li, Z., Salvador, M., & Yao, X. (2018). Mindfulness in nursing students: The Five Facet Mindfulness Questionnaire in samples of nursing students in China, the Philippines, and South Africa. *International Journal of Mental Health Nursing, 27*(3), 975–986. <https://doi.org/10.1111/inm.12405>
- Asensio-Martínez, Á., Masluk, B., Montero-Marin, J., Olivan-Blázquez, B., Navarro-Gil, M. T., García-Campayo, J., & Magallón-Botaya, R. (2019). Validation of Five Facets Mindfulness Questionnaire – Short form, in Spanish, general health care services patients sample: Prediction of depression through mindfulness scale. *PLOS ONE, 14*(4), e0214503. <https://doi.org/10.1371/journal.pone.0214503>
- Baer, R. A. (2019). Assessment of mindfulness by self-report. *Current Opinion in Psychology, 28*, 42–48. <https://doi.org/10.1016/j.copsy.2018.10.015>
- Baer, R. A., Gu, J., Cavanagh, K., & Strauss, C. (2019). Differential sensitivity of mindfulness questionnaires to change with treatment: A systematic review and meta-analysis. *Psychological Assessment, 31*(10), 1247–1263. <https://doi.org/10.1037/pas0000744>
- Baer, R. A., Samuel, D. B., & Lykins, E. L. B. (2011). Differential item functioning on the Five Facet Mindfulness Questionnaire is minimal in demographically matched meditators and nonmeditators. *Assessment, 18*(1), 3–10. <https://doi.org/10.1177/1073191110392498>
- Baer, R. A., Smith, G. T., & Allen, K. B. (2004). Assessment of mindfulness by self-report: The Kentucky Inventory of Mindfulness Skills. *Assessment, 11*(3), 191–206. <https://doi.org/10.1177/1073191104268029>
- Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment, 13*(1), 27–45. <https://doi.org/10.1177/1073191105283504>
- Baminiwatta, A., & Solangaarachchi, I. (2021). Trends and developments in mindfulness research over 55 years: A bibliometric analysis of publications indexed in Web of Science. *Mindfulness, 12*(9), 2099–2116. <https://doi.org/10.1007/s12671-021-01681-x>
- Bednar, K., Voracek, M., & Tran, U. S. (2020). Common factors underlying the five facets of mindfulness and proposed mechanisms: A psychometric study among meditators and non-meditators. *Mindfulness, 11*(12), 2804–2817. <https://doi.org/10.1007/s12671-020-01492-6>
- Benton, E. (2015). *Cross-cultural differences in mindfulness concepts: A comparison between Ugandan Christians and American Buddhist meditators* (Publication no. 10022990) [Doctoral dissertation, San Diego State University]. ProQuest Dissertations Publishing.
- Bergomi, C., Tschacher, W., & Kupper, Z. (2013). Measuring mindfulness: First steps towards the development of a comprehensive mindfulness scale. *Mindfulness, 4*(1), 18–32. <https://doi.org/10.1007/s12671-012-0102-9>
- Bishop, S. R., Lau, M., Shapiro, S., Carlson, L., Anderson, N. D., Carmody, J., Segal, Z. V., Abbey, S., Speca, M., Velting, D., & Devins, G. (2004). Mindfulness: A proposed operational definition. *Clinical Psychology: Science and Practice, 11*(3), 230–241. <https://doi.org/10.1093/clipsy.bph077>
- Blanke, E. S., & Brose, A. (2017). Mindfulness in daily life: A multidimensional approach. *Mindfulness, 8*(3), 737–750. <https://doi.org/10.1007/s12671-016-0651-4>
- Bodenlos, J. S., Wells, S. Y., Noonan, M., & Mayrsohn, A. (2015). Facets of dispositional mindfulness and health among college students. *The Journal of Alternative and Complementary Medicine, 21*(10), 645–652. <https://doi.org/10.1089/acm.2014.0302>
- Bohlmeijer, E., Ten Klooster, P. M., Fledderus, M., Veehof, M., & Baer, R. A. (2011). Psychometric properties of the Five Facet Mindfulness Questionnaire in depressed adults and development of a short form. *Assessment, 18*(3), 308–320. <https://doi.org/10.1177/1073191111408231>
- Bond, F. W., Hayes, S. C., Baer, R. A., Carpenter, K. M., Guenole, N., Orcutt, H. K., Waltz, T., & Zettle, R. D. (2011). Preliminary psychometric properties of the Acceptance and Action Questionnaire–II: A revised measure of psychological inflexibility and experiential avoidance. *Behavior Therapy, 42*(4), 676–688. <https://doi.org/10.1016/j.beth.2011.03.007>



- Bowman, A. S. (2014). *Evaluating the psychometric properties of the Five-Facet Mindfulness Questionnaire: An item response theory analysis* [Doctoral dissertation, Middle Tennessee State University, JEWL Scholar]. <https://jewlscholar.mtsu.edu/items/9f84b99e-bb6d-4e57-9dd9-9a13b54de2a7>
- Braboszcz, C., Cahn, B. R., Levy, J., Fernandez, M., & Delorme, A. (2017). Increased gamma brainwave amplitude compared to control in three different meditation traditions. *PLOS ONE*, *12*(1), e0170647. <https://doi.org/10.1371/journal.pone.0170647>
- Brady, B., Kneebone, I. I., & Bailey, P. E. (2019). Validation of the Five Facet Mindfulness Questionnaire among community-dwelling older adults. *Mindfulness*, *10*(3), 529–536. <https://doi.org/10.1007/s12671-018-0994-0>
- Bränström, R., Duncan, L. G., & Moskowitz, J. T. (2011). The association between dispositional mindfulness, psychological well-being, and perceived health in a Swedish population-based sample. *British Journal of Health Psychology*, *16*(2), 300–316. <https://doi.org/10.1348/135910710x501683>
- Bravo, A. J., Pearson, M. R., Wilson, A. D., & Witkiewitz, K. (2018). When traits match states: Examining the associations between self-report trait and state mindfulness following a state mindfulness induction. *Mindfulness*, *9*(1), 199–211. <https://doi.org/10.1007/s12671-017-0763-5>
- Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology*, *84*(4), 822–848. <https://doi.org/10.1037/0022-3514.84.4.822>
- Brown, K. W., Ryan, R. M., & Creswell, J. D. (2007). Addressing fundamental questions about mindfulness. *Psychological Inquiry*, *18*(4), 272–281. <https://doi.org/10.1080/10478400701703344>
- Bucknell, R. S. (1993). Reinterpreting the jhānas. *Journal of the International Association of Buddhist Studies*, 375–409. <https://journals.ub.uni-heidelberg.de/index.php/jiabs/article/download/8818/2725>
- Burg, J. M., Probst, T., Heidenreich, T., & Michalak, J. (2017). Development and psychometric evaluation of the body mindfulness questionnaire. *Mindfulness*, *8*(3), 807–818. <https://doi.org/10.1007/s12671-016-0659-9>
- Burzler, M. A., Voracek, M., Hos, M., & Tran, U. S. (2019). Mechanisms of mindfulness in the general population. *Mindfulness*, *10*(3), 469–480. <https://doi.org/10.1007/s12671-018-0988-y>
- Campos, D., Modrego-Alarcón, M., López-del-Hoyo, Y., González-Panzano, M., Van Gordon, W., Shonin, E., Navarro-Gil, M., & García-Campayo, J. (2019). Exploring the role of meditation and dispositional mindfulness on social cognition domains: A controlled study. *Frontiers in Psychology*, *10*, Article 809. <https://doi.org/10.3389/fpsyg.2019.00809>
- Cardaciotto, L., Herbert, J. D., Forman, E. M., Moitra, E., & Farrow, V. (2008). The assessment of present-moment awareness and acceptance: The Philadelphia Mindfulness Scale. *Assessment*, *15*(2), 204–223. <https://doi.org/10.1177/1073191107311467>
- Carmody, J., & Baer, R. A. (2008). Relationships between mindfulness practice and levels of mindfulness, medical and psychological symptoms and well-being in a mindfulness-based stress reduction program. *Journal of Behavioral Medicine*, *31*(1), 23–33. <https://doi.org/10.1007/s10865-007-9130-7>
- Carpenter, J. K., Conroy, K., Gomez, A. F., Curren, L. C., & Hofmann, S. G. (2019). The relationship between trait mindfulness and affective symptoms: A meta-analysis of the Five Facet Mindfulness Questionnaire (FFMQ). *Clinical Psychology Review*, *74*, 101785. <https://doi.org/10.1016/j.cpr.2019.101785>
- Cebolla, A., García-Palacios, A., Soler, J., Guillen, V., Baños, R., & Botella, C. (2012). Psychometric properties of the Spanish validation of the Five Facets of Mindfulness Questionnaire (FFMQ). *European Journal of Psychiatry*, *26*(2), 118–126. <https://doi.org/10.4321/s0213-61632012000200005>
- Cebolla, Ausiàs, Campos, D., Galiana, L., Oliver, A., Tomás, J. M., Feliu-Soler, A., Soler, J., García-Campayo, J., Demarzo, M., & Baños, R. M. (2017). Exploring relations among mindfulness facets and various meditation practices: Do they work in different ways? *Consciousness and Cognition*, *49*, 172–180. <https://doi.org/10.1016/j.concog.2017.01.012>
- Cebolla, Ausiàs, Galiana, L., Campos, D., Oliver, A., Soler, J., Demarzo, M., Baños, R. M., Feliu-Soler, A., & García-Campayo, J. (2018). How does mindfulness work? Exploring a theoretical model using samples of meditators and non-meditators. *Mindfulness*, *9*(3), 860–870. <https://doi.org/10.1007/s12671-017-0826-7>
- Chadwick, P., Hember, M., Symes, J., Peters, E., Kuipers, E., & Dagnan, D. (2008). Responding mindfully to unpleasant thoughts and images: Reliability and validity of the Southampton mindfulness questionnaire (SMQ). *British Journal of Clinical Psychology*, *47*(4), 451–455. <https://doi.org/10.1348/014466508x314891>
- Chen, S., You, B., & Jackson, T. (2021). Facets of mindfulness as predictors of emotional distress among Chinese adults with chronic musculoskeletal pain. *Mindfulness*, *12*(3), 775–783. <https://doi.org/10.1007/s12671-020-01548-7>
- Chiesa, A. (2012). The difficulty of defining mindfulness: Current thought and critical issues. *Mindfulness*, *4*(3), 255–268. <https://doi.org/10.1007/s12671-012-0123-4>
- Chiesa, A., & Malinowski, P. (2011). Mindfulness-based approaches: Are they all the same? *Journal of Clinical Psychology*, *67*(4), 404–424. <https://doi.org/10.1002/jc.20776>
- Christopher, M. S., Christopher, V., & Charoensuk, S. (2009). Assessing “western” mindfulness among Thai Theravāda Buddhist monks. *Mental Health, Religion & Culture*, *12*(3), 303–314. <https://doi.org/10.1080/13674670802651487>
- Christopher, M. S., Woodrich, L. E., & Tiernan, K. A. (2014). Using cognitive interviews to assess the cultural validity of state and trait measures of mindfulness among Zen Buddhists. *Mindfulness*, *5*(2), 145–160. <https://doi.org/10.1007/s12671-012-0160-z>

- Coffey, K. A., Hartman, M., & Fredrickson, B. L. (2010). Deconstructing mindfulness and constructing mental health: Understanding mindfulness and its mechanisms of action. *Mindfulness*, 1(4), 235–253. <https://doi.org/10.1007/s12671-010-0033-2>
- Cortazar, N., Calvete, E., Fernández-González, L., & Orue, I. (2020). Development of a short form of the Five Facet Mindfulness Questionnaire—adolescents for children and adolescents. *Journal of Personality Assessment*, 102(5), 641–652. <https://doi.org/10.1080/00223891.2019.1616206>
- Dane, E. (2015). Mindfulness and performance: Cautionary notes on a compelling concept. *Industrial and Organizational Psychology*, 8(4), 647–652. <https://doi.org/10.1017/iop.2015.94>
- Davis, K. M., Lau, M. A., & Cairns, D. R. (2009). Development and preliminary validation of a trait version of the Toronto Mindfulness Scale. *Journal of Cognitive Psychotherapy*, 23(3), 185–197. <https://doi.org/10.1891/0889-8391.23.3.185>
- de Barros, V. V. D., Kozasa, E. H., Souza, I. C. W. D., & Ronzani, T. M. (2014). Validity evidence of the Brazilian version of the Five Facet Mindfulness Questionnaire (FFMQ). *Psicologia: Teoria e Pesquisa*, 30(3), 317–327. <https://doi.org/10.1590/s0102-37722014000300009>
- de Bruin, E. I., Topper, M., Muskens, J. G. A. M., Bögels, S. M., & Kamphuis, J. H. (2012). Psychometric properties of the Five Facets Mindfulness Questionnaire (FFMQ) in a meditating and a non-meditating sample. *Assessment*, 19(2), 187–197. <https://doi.org/10.1177/1073191112446654>
- de Vibe, M., Solhaug, I., Tyssen, R., Friberg, O., Rosenvinge, J. H., Sørli, T., Halland, E., & Bjørndal, A. (2015). Does personality moderate the effects of mindfulness training for medical and psychology students? *Mindfulness*, 6(2), 281–289. <https://doi.org/10.1007/s12671-013-0258-y>
- Diamantopoulos, A., & Siguaw, J. A. (2006). Formative versus reflective indicators in organizational measure development: A comparison and empirical illustration. *British Journal of Management*, 17(4), 263–282. <https://doi.org/10.1111/j.1467-8551.2006.00500.x>
- Duan, W., & Li, J. (2016). Distinguishing dispositional and cultivated forms of mindfulness: Item-level factor analysis of five-facet mindfulness questionnaire and construction of short inventory of mindfulness capability. *Frontiers in Psychology*, 7, 1348–1358. <https://doi.org/10.3389/fpsyg.2016.01348>
- Dundas, I., Vøllestad, J., Binder, P.-E., & Sivertsen, B. (2013). The Five Factor Mindfulness Questionnaire in Norway. *Scandinavian Journal of Psychology*, 54(3), 250–260. <https://doi.org/10.1111/sjop.12044>
- Eberth, J. (2016). *Wirkungen und Wirkmechanismen achtsamkeitsbasierter Meditation: Entwicklung eines Modells über die durch buddhistische Meditation ausgelösten psychischen Veränderungen im Alltag* [Doctoral dissertation, Technische Universität Chemnitz, MONARCH]. [https://monarch.qucosa.de/lauding-page/?tx\\_dlf\[id\]=https%3A%2F%2Fmonarch.qucosa.de%2Fapi%2Fqucosa%253A20519%2Fmets](https://monarch.qucosa.de/lauding-page/?tx_dlf[id]=https%3A%2F%2Fmonarch.qucosa.de%2Fapi%2Fqucosa%253A20519%2Fmets)
- Eisenlohr-Moul, T. A., Walsh, E. C., Charnigo, R. J., Jr., Lynam, D. R., & Baer, R. A. (2012). The “what” and the “how” of dispositional mindfulness: Using interactions among subscales of the Five-Facet Mindfulness Questionnaire to understand its relation to substance use. *Assessment*, 19(3), 276–286. <https://doi.org/10.1177/1073191112446658>
- Eliassen, B. K., & Høifødt, T. S. (2017). Exploring individual profiles in mindfulness measures. *Mindfulness*, 8(2), 522–524. <https://doi.org/10.1007/s12671-016-0642-5>
- F. Wong, K., A. A. Massar, S., Chee, M. W. L., & Lim, J. (2018). Towards an objective measure of mindfulness: Replicating and extending the features of the breath-counting task. *Mindfulness*, 9(5), 1402–1410. <https://doi.org/10.1007/s12671-017-0880-1>
- Falkenström, F. (2010). Studying mindfulness in experienced meditators: A quasi-experimental approach. *Personality and Individual Differences*, 48(3), 305–310. <https://doi.org/10.1016/j.paid.2009.10.022>
- Feng, X. (2017). *Differences and similarities between Buddhism and psychology in the conceptualisation of mindfulness* [Doctoral dissertation, Auckland University of Technology]. <http://hdl.handle.net/10292/10777>
- Feruglio, S., Matiz, A., Pagnoni, G., Fabbro, F., & Crescentini, C. (2021). The Impact of Mindfulness Meditation on the Wandering Mind: A Systematic Review. *Neuroscience & Biobehavioral Reviews*, 131, 313–330. <https://doi.org/10.1016/j.neubiorev.2021.09.032>
- Finlayson, K. W., & Dixon, A. (2008). Qualitative meta-synthesis: A guide for the novice. *Nurse Researcher*, 15(2), 59–71. <https://doi.org/10.7748/nr2008.01.15.2.59.c6330>
- Framson, C., Kristal, A. R., Schenk, J. M., Littman, A. J., Zeliadt, S., & Benitez, D. (2009). Development and validation of the mindful eating questionnaire. *Journal of the American Dietetic Association*, 109(8), 1439–1444. <https://doi.org/10.1016/j.jada.2009.05.006>
- Fresco, D. M., Moore, M. T., van Dulmen, M. H. M., Segal, Z. V., Ma, S. H., Teasdale, J. D., & Williams, J. M. G. (2007). Initial psychometric properties of the experiences questionnaire: Validation of a self-report measure of decentering. *Behavior Therapy*, 38(3), 234–246. <https://doi.org/10.1016/j.beth.2006.08.003>
- Germer, C. K. (2005). Teaching mindfulness in therapy. *Mindfulness and Psychotherapy*, 1(2), 113–129.
- Gherardi-Donato, E. C. S., Moraes, V. S., & Esper, L. H. (2020). Mindfulness measurement instruments: A systematic review. *International Journal of Psychiatry Research*, 3(4), 1–12. <https://doi.org/10.33425/2641-4317.1066>
- Giovannini, C., Giromini, L., Bonalume, L., Tagini, A., Lang, M., & Amadei, G. (2014). The Italian Five Facet Mindfulness Questionnaire: A contribution to its validity and reliability. *Journal of Psychopathology and Behavioral Assessment*, 36(3), 415–423. <https://doi.org/10.1007/s10862-013-9403-0>

- Goldberg, S. B., Riordan, K. M., Sun, S., & Davidson, R. J. (2021). The empirical status of mindfulness-based interventions: A systematic review of 44 meta-analyses of randomized controlled trials. *Perspectives on Psychological Science*, 17(1), 108–130. <https://doi.org/10.1177/1745691620968771>
- Goldberg, S. B., Tucker, R. P., Greene, P. A., Simpson, T. L., Hoyt, W. T., Kearney, D. J., & Davidson, R. J. (2019). What can we learn from randomized clinical trials about the construct validity of self-report measures of mindfulness? A meta-analysis. *Mindfulness*, 10(5), 775–785. <https://doi.org/10.1007/s12671-018-1032-y>
- Golley, M. T. (2017). *Understandings of the mindfulness construct: A clinician survey (Publication no. 10616186)* [Doctoral dissertation, Palo Alto University]. ProQuest Dissertations Publishing.
- Golubev, A. M., & Dorosheva, E. A. (2018). Osobennosti primeneniia russkoiazynoy versii piatifaktornogo oprosnika osoznannosti [Psychometrical characteristics and applied features of a Russian version of Five facets Mindfulness Questionnaire (FFMQ)]. *Sibirskiy Psikhologicheskii Zhurnal*, 69(69), 46–68. <https://doi.org/10.17223/17267080/69/3>
- Gómez-Odrizola, J., & Calvete, E. (2020). Longitudinal bidirectional associations between dispositional mindfulness, maladaptive schemas, and depressive symptoms in adolescents. *Mindfulness*, 11(8), 1943–1955. <https://doi.org/10.1007/s12671-020-01402-w>
- Goodall, K., Trejnowska, A., & Darling, S. (2012). The relationship between dispositional mindfulness, attachment security and emotion regulation. *Personality and Individual Differences*, 52(5), 622–626. <https://doi.org/10.1016/j.paid.2011.12.008>
- Gorman, T. E., & Green, C. S. (2016). Short-term mindfulness intervention reduces the negative attentional effects associated with heavy media multitasking. *Scientific Reports*, 6(1), 1–7. <https://doi.org/10.1038/srep24542>
- Greco, L. A., Baer, R. A., & Smith, G. T. (2011). Assessing mindfulness in children and adolescents: Development and validation of the Child and Adolescent Mindfulness Measure (CAMM). *Psychological Assessment*, 23(3), 606–614. <https://doi.org/10.1037/a0022819>
- Grossman, P. (2019). On the porosity of subject and object in 'mindfulness' scientific study: Challenges to 'scientific' construction, operationalization and measurement of mindfulness. *Current Opinion in Psychology*, 28, 102–107. <https://doi.org/10.1016/j.copsyc.2018.11.008>
- Gu, J., Strauss, C., Crane, C., Barnhofer, T., Karl, A., Cavanagh, K., & Kuyken, W. (2016). Examining the factor structure of the 39-item and 15-item versions of the Five Facet Mindfulness Questionnaire before and after mindfulness-based cognitive therapy for people with recurrent depression. *Psychological Assessment*, 28(7), 791–802. <https://doi.org/10.1037/pas0000263>
- Haas, B. W., & Akamatsu, Y. (2019). Psychometric investigation of the five facets of mindfulness and well-being measures in the Kingdom of Bhutan and the USA. *Mindfulness*, 10(7), 1339–1351. <https://doi.org/10.1007/s12671-018-1089-7>
- Hanley, A. W., Abell, N., Osborn, D. S., Roehrig, A. D., & Canto, A. I. (2016). Mind the gaps: Are conclusions about mindfulness entirely conclusive? *Journal of Counseling & Development*, 94(1), 103–113. <https://doi.org/10.1002/jcad.12066>
- Hanley, A. W., Garland, E., Canto, A., Warner, A., Hanley, R., Dehili, V., & Proctor, A. (2014). Dispositional mindfulness and bias in self-theories. *Mindfulness*, 6(2), 202–207. <https://doi.org/10.1007/s12671-013-0245-3>
- Hanley, A. W., Mehling, W. E., & Garland, E. L. (2017). Holding the body in mind: Interoceptive awareness, dispositional mindfulness and psychological well-being. *Journal of Psychosomatic Research*, 99, 13–20. <https://doi.org/10.1016/j.jpsychores.2017.05.014>
- Hawley, L. L., Rogojanski, J., Vorstenbosch, V., Quilty, L. C., Laposa, J. M., & Rector, N. A. (2017). The structure, correlates, and treatment related changes of mindfulness facets across the anxiety disorders and obsessive compulsive disorder. *Journal of Anxiety Disorders*, 49, 65–75. <https://doi.org/10.1016/j.janxdis.2017.03.003>
- Hayes, S. C., & Shenk, C. (2004). Operationalizing mindfulness without unnecessary attachments. *Clinical Psychology: Science and Practice*, 11(3), 249–254. <https://doi.org/10.1093/clipsy.bph079>
- Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (2009). *Acceptance and Commitment Therapy*. American Psychological Association.
- Hayes, S. C., Strosahl, K., Wilson, K. G., Bissett, R. T., Pistorello, J., Toarmino, D., Polusny, M. A., Dykstra, T. A., Batten, S. V., Bergan, J., Stewart, S. H., Zvolensky, M. J., Eifert, G. H., Bond, F. W., Forsyth, J. P., Karekla, M., & McCurry, S. M. (2004). Measuring experiential avoidance: A preliminary test of a working model. *The Psychological Record*, 54(4), 553–578. <https://doi.org/10.1007/bf03395492>
- Heeren, A., Deplus, S., Peschard, V., Nef, F., Kotsou, I., Dierickx, C., Mondillon, L., Robinaugh, D. J., & Philippot, P. (2015). Does change in self-reported mindfulness mediate the clinical benefits of mindfulness training? A controlled study using the French translation of the Five Facet Mindfulness Questionnaire. *Mindfulness*, 6(3), 553–559. <https://doi.org/10.1007/s12671-014-0287-1>
- Hick, S. F. (2009). *Mindfulness and social work*. Oxford University Press.
- Hölzel, B. K., Lazar, S. W., Gard, T., Schuman-Olivier, Z., Vago, D. R., & Ott, U. (2011). How does mindfulness meditation work? Proposing mechanisms of action from a conceptual and neural perspective. *Perspectives on Psychological Science*, 6(6), 537–559. <https://doi.org/10.1177/1745691611419671>



- Iani, L., Lauriola, M., Cafaro, V., & Didonna, F. (2017). Dimensions of mindfulness and their relations with psychological well-being and neuroticism. *Mindfulness*, *8*(3), 664–676. <https://doi.org/10.1007/s12671-016-0645-2>
- Iani, L., Lauriola, M., Chiesa, A., & Cafaro, V. (2019). Associations between mindfulness and emotion regulation: The key role of describing and nonreactivity. *Mindfulness*, *10*(2), 366–375. <https://doi.org/10.1007/s12671-018-0981-5>
- Jayawardene, W. P., Lohrmann, D. K., Erbe, R. G., & Torabi, M. R. (2017). Effects of preventive online mindfulness interventions on stress and mindfulness: A meta-analysis of randomized controlled trials. *Preventive Medicine Reports*, *5*, 150–159. <https://doi.org/10.1016/j.pmedr.2016.11.013>
- Jensen, C. G., Krogh, S. C., Westphael, G., & Hjordt, L. V. (2019). Mindfulness is positively related to socioeconomic job status and income and independently predicts mental distress in a long-term perspective: Danish validation studies of the Five-Factor Mindfulness Questionnaire. *Psychological Assessment*, *31*(1), 1–20. <https://doi.org/10.1037/pas000667>
- Johns, K. N. (2016). *Item response theory applied to the Five Facet Mindfulness Questionnaire* [Unpublished doctoral dissertation]. University of South Alabama.
- Kabat-Zinn, J. (1982). An outpatient program in behavioral medicine for chronic pain patients based on the practice of mindfulness meditation: Theoretical considerations and preliminary results. *General Hospital Psychiatry*, *4*(1), 33–47. [https://doi.org/10.1016/0163-8343\(82\)90026-3](https://doi.org/10.1016/0163-8343(82)90026-3)
- Kabat-Zinn, J. (1990). Mindfulness-based stress reduction. Using the Wisdom of Your Body and Mind to Face Stress, Pain, and Illness. *Swedish*.
- Kabat-Zinn, J. (1994, September). Catalyzing movement towards a more contemplative/sacred-appreciating/non-dualistic society. *Meeting of the Working Group. The Contemplative Mind in Society*.
- Kabat-Zinn, J. (2012). *Mindfulness for beginners: Reclaiming the present moment—and your life*. Sounds True.
- Kaplan, D. M., Raison, C. L., Milek, A., Tackman, A. M., Pace, T. W. W., & Mehl, M. R. (2018). Dispositional mindfulness in daily life: A naturalistic observation study. *PLOS ONE*, *13*(11), e0206029. <https://doi.org/10.1371/journal.pone.0206029>
- Karl, Johannes A., Prado, S. M. M., Gračanin, A., Verhaeghen, P., Ramos, A., Mandal, S. P., Michalak, J., Zhang, C.-Q., Schmidt, C., Tran, U. S., Druica, E., Solem, S., Astani, A., Liu, X., Luciano, J. V., Tkalčić, M., Lilja, J. L., Dundas, I., Wong, S. Y. S., & Fischer, R. (2020). The cross-cultural validity of the Five-Facet Mindfulness Questionnaire across 16 countries. *Mindfulness*, *11*(5), 1226–1237. <https://doi.org/10.1007/s12671-020-01333-6>
- Karl, Johannes Alfons, & Fischer, R. (2019). *Individual differences and mindfulness*. <https://doi.org/10.31234/osf.io/z2cx6>
- Kiken, L. G., Garland, E. L., Bluth, K., Palsson, O. S., & Gaylord, S. A. (2015). From a state to a trait: Trajectories of state mindfulness in meditation during intervention predict changes in trait mindfulness. *Personality and Individual Differences*, *81*, 41–46. <https://doi.org/10.1016/j.paid.2014.12.044>
- Kirschbaum, C., Pirke, K. M., & Hellhammer, D. H. (1993). The ‘Trier Social Stress Test’: A tool for investigating psychobiological stress responses in a laboratory setting. *Neuropsychobiology*, *28*(1–2), 76–81. <https://doi.org/10.1159/000119004>
- Korinek, D., Benda, J., & Zitnik, J. (2019). Psychometric characteristics of the short Czech version of the Five Facet Mindfulness Questionnaire (FFMQ-15-CZ). *Ceskoslovenska Psychologie*, *63*(1), 55–70.
- Kral, T. R. A., Davis, K., Korponay, C., Hirshberg, M. J., Hoel, R., Tello, L. Y., Goldman, R. I., Rosenkranz, M. A., Lutz, A., & Davidson, R. J. (2022). Absence of structural brain changes from mindfulness-based stress reduction: Two combined randomized controlled trials. *Science Advances*, *8*(20), Article eabk3316. <https://doi.org/10.1126/sciadv.abk3316>
- Kropp, A., & Sedlmeier, P. (2019). What makes mindfulness-based interventions effective? An examination of common components. *Mindfulness*, *10*(10), 2060–2072. <https://doi.org/10.1007/s12671-019-01167-x>
- Kuan, T.-F. (2008). *Mindfulness in early Buddhism*. Routledge.
- Lakatos, L., Turcotte, J., & Oddson, B. (2019). *When two mindfulnesses meet*. <https://doi.org/10.1101/728584>
- Lal, V. N., & Jayan, C. (2019). Correlates of dispositional mindfulness: A theoretical meta-analysis. *Indian Journal of Positive Psychology*, *10*(3), 192–200.
- Lau, M. A., Bishop, S. R., Segal, Z. V., Buis, T., Anderson, N. D., Carlson, L., Shapiro, S., Carmody, J., Abbey, S., & Devins, G. (2006). The Toronto mindfulness scale: Development and validation. *Journal of Clinical Psychology*, *62*(12), 1445–1467. <https://doi.org/10.1002/jclp.20326>
- Lecuona, O., García-Garzón, E., García-Rubio, C., & Rodríguez-Carvajal, R. (2020). A psychometric review and conceptual replication study of the Five Facets Mindfulness Questionnaire latent structure. *Assessment*, *27*(5), 859–872. <https://doi.org/10.1177/1073191119873718>
- Lee, J., Kim, K. H., Webster, C. S., & Henning, M. A. (2021). The evolution of mindfulness from 1916 to 2019. *Mindfulness*, *12*(8), 1849–1859. <https://doi.org/10.1007/s12671-021-01603-x>
- Leinberger, K. (2012). *Measuring mindfulness in meditators, and examining how aspects of meditation practice affect mindfulness* [Doctoral dissertation]. University of Texas.
- Lilja, J. L., Frodi-Lundgren, A., Hanse, J. J., Josefsson, T., Lundh, L.-G., Sköld, C., Hansen, E., & Broberg, A. G. (2011). Five Facets Mindfulness Questionnaire—reliability and factor structure: A Swedish version. *Cognitive Behaviour Therapy*, *40*(4), 291–303. <https://doi.org/10.1080/16506073.2011.580367>

- Lilja, J. L., Lundh, L. G., Josefsson, T., & Falkenström, F. (2013). Observing as an essential facet of mindfulness: A comparison of FFMQ patterns in meditating and non-meditating individuals. *Mindfulness*, 4(3), 203–212. <https://doi.org/10.1007/s12671-012-0111-8>
- Lin, Y., Fisher, M. E., Roberts, S. M. M., & Moser, J. S. (2016). Deconstructing the emotion regulatory properties of mindfulness: An electrophysiological investigation. *Frontiers in Human Neuroscience*, 10, 451–459. <https://doi.org/10.3389/fnhum.2016.00451>
- Linehan, M. M. (1993). Dialectical behavior therapy for treatment of borderline personality disorder: Implications for the treatment of substance abuse. *NIDA Research Monograph*, 137, 201–217.
- Lorentz, N. (2012). *Measuring mindfulness: A critical review (Publication no. 3515261)* [Doctoral dissertation, Chicago School of Professional Psychology]. ProQuest Dissertation Publishing.
- Lutz, A., Jha, A. P., Dunne, J. D., & Saron, C. D. (2015). Investigating the phenomenological matrix of mindfulness-related practices from a neurocognitive perspective. *American Psychologist*, 70(7), 632–658. <https://doi.org/10.1037/a0039585>
- Malinowski, P. (2008). Mindfulness as psychological dimension: Concepts and applications. *Irish Journal of Psychology*, 29(1–2), 155–166. <https://doi.org/10.1080/03033910.2008.10446281>
- Matko, K., Ott, U., & Sedlmeier, P. (2021). What do meditators do when they meditate? Proposing a novel basis for future meditation research. *Mindfulness*, 12(7), 1791–1811. <https://doi.org/10.1007/s12671-021-01641-5>
- Mattes, J. (2019). Systematic review and meta-analysis of correlates of FFMQ mindfulness facets. *Frontiers in Psychology*, 10, 2684–2689. <https://doi.org/10.3389/fpsyg.2019.02684>
- May, L. M., & Reinhardt, K. M. (2018). Self-other agreement in the assessment of mindfulness using the five-facet mindfulness questionnaire. *Mindfulness*, 9(1), 105–116. <https://doi.org/10.1007/s12671-017-0749-3>
- McCaffrey, S., Reitman, D., & Black, R. (2016). Mindfulness in Parenting Questionnaire (MIPQ): Development and validation of a measure of mindful parenting. *Mindfulness*, 8(1), 232–246. <https://doi.org/10.1007/s12671-016-0596-7>
- Medvedev, O. N., Norden, P. A., Krägeloh, C. U., & Siegert, R. J. (2018). Investigating unique contributions of dispositional mindfulness facets to depression, anxiety, and stress in general and student populations. *Mindfulness*, 9(6), 1757–1767. <https://doi.org/10.1007/s12671-018-0917-0>
- Medvedev, O. N., Siegert, R. J., Kersten, P., & Krägeloh, C. U. (2017). Improving the precision of the Five Facet Mindfulness Questionnaire using a Rasch approach. *Mindfulness*, 8(4), 995–1008. <https://doi.org/10.1007/s12671-016-0676-8>
- Medvedev, O. N., Titkova, E. A., Siegert, R. J., Hwang, Y. S., & Krägeloh, C. U. (2018). Evaluating short versions of the Five Facet Mindfulness Questionnaire using Rasch analysis. *Mindfulness*, 9(5), 1411–1422. <https://doi.org/10.1007/s12671-017-0881-0>
- Mejia, A. (2013). *Personal conceptualization and use of mindfulness: Developing an emerging model using a grounded theory framework* [Doctoral dissertation, Arizona State University]. [https://keep.lib.asu.edu/flsystem/fedora/c7/104434/Mejia\\_asu\\_0010E\\_13566.pdf](https://keep.lib.asu.edu/flsystem/fedora/c7/104434/Mejia_asu_0010E_13566.pdf)
- Mesmer-Magnus, J., Manapragada, A., Viswesvaran, C., & Allen, J. W. (2017). Trait mindfulness at work: A meta-analysis of the personal and professional correlates of trait mindfulness. *Human Performance*, 30(2–3), 79–98. <https://doi.org/10.1080/08959285.2017.1307842>
- Michalak, J., Zarbock, G., Drews, M., Otto, D., Mertens, D., Ströhle, G., Schwinger, M., Dahme, B., & Heidenreich, T. (2016). Assessment of mindfulness with the German version of the Five Facet Mindfulness Questionnaires (FFMQ-D). *Zeitschrift für Gesundheitspsychologie*, 24(1), 1–12. <https://doi.org/10.1026/0943-8149/a000149>
- Montero-Marin, J., Puebla-Guedea, M., Herrera-Mercadal, P., Cebolla, A., Soler, J., Demarzo, M., Vazquez, C., Rodríguez-Bornaetxea, F., & García-Campayo, J. (2016). Psychological effects of a 1-month meditation retreat on experienced meditators: The role of non-attachment. *Frontiers in Psychology*, 7, 1935–1943. <https://doi.org/10.3389/fpsyg.2016.01935>
- Moy, T. (2012). *Die unterschiedlichen Effekte verschiedener Meditationsarten und-stile auf Achtsamkeitserleben, psychische Gesundheit und Persönlichkeit* [Unpublished master thesis]. University of Vienna.
- Mugrabi, F., Rozner, L., & Peles, E. (2020). The mindfulness trait and high perceived stress changes during treatment in patients with psychiatric disorders. *Current Psychology*, 41(9), 5959–5966. <https://doi.org/10.1007/s12144-020-01108-1>
- Müller, B. C., Gerasimova, A., & Ritter, S. M. (2016). Concentrative meditation influences creativity by increasing cognitive flexibility. *Psychology of Aesthetics, Creativity, and the Arts*, 10(3), 278–286. <https://doi.org/10.1037/a0040335>
- Nilsson, H., & Kazemi, A. (2016). Reconciling and thematizing definitions of mindfulness: The big five of mindfulness. *Review of General Psychology*, 20(2), 183–193. <https://doi.org/10.1037/gpr0000074>
- Nyklíček, I., & Denollet, J. (2009). Development and evaluation of the Balanced Index of Psychological Mindedness (BIPM). *Psychological Assessment*, 21(1), 32–44. <https://doi.org/10.1037/a0014418>
- O'Connor, N. A. (2015). *The evolving understanding of mindfulness in psychology: Comparing Western assessment instruments to the early Buddhist canon* [Doctoral dissertation]. Widener University.
- O'Driscoll, C., Bell, V., & Shaikh, M. (2018). *Concomitant effects of Mindfulness: The Mindfulness Strategies and Difficulties Questionnaire*. <https://doi.org/10.31219/osf.io/2juzc>



- Oñate, L., & Calvete, E. (2018). Adaptation of the Five-Facet Mindfulness Questionnaire-Short Form to Spanish family caregivers of people with intellectual and developmental disabilities. *Anales de Psicología/Annals of Psychology*, *34*(2), 305–313. <https://doi.org/10.6018/analesps.34.2.294551>
- Pang, D., & Ruch, W. (2019a). Scrutinizing the components of mindfulness: Insights from current, past, and non-meditators. *Mindfulness*, *10*(3), 492–505. <https://doi.org/10.1007/s12671-018-0990-4>
- Pang, D., & Ruch, W. (2019b). The mutual support model of mindfulness and character strengths. *Mindfulness*, *10*(8), 1545–1559. <https://doi.org/10.1007/s12671-019-01103-z>
- Parkinson, T. D., Kornelsen, J., & Smith, S. D. (2019). Trait mindfulness and functional connectivity in cognitive and attentional resting state networks. *Frontiers in Human Neuroscience*, *13*, 112–119. <http://doi.org/10.3389/fnhum.2019.00112>
- Pelham, W. E., III, Gonzalez, O., Metcalf, S. A., Whicker, C. L., Witkiewitz, K., Marsch, L. A., & Mackinnon, D. P. (2019). Evaluating the factor structure of each facet of the Five Facet Mindfulness Questionnaire. *Mindfulness*, *10*(12), 2629–2646. <https://doi.org/10.1007/s12671-019-01235-2>
- Peters, J. R., Eisenlohr-Moul, T. A., & Smart, L. M. (2016). Dispositional mindfulness and rejection sensitivity: The critical role of nonjudgment. *Personality and Individual Differences*, *93*, 125–129. <https://doi.org/10.1016/j.paid.2015.06.029>
- Petrocchi, N., & Ottaviani, C. (2016). Mindfulness facets distinctively predict depressive symptoms after two years: The mediating role of rumination. *Personality and Individual Differences*, *93*, 92–96. <https://doi.org/10.1016/j.paid.2015.08.017>
- Pinniger, R., Thorsteinsson, E. B., Brown, R. F., & McKinley, P. (2013). Tango dance can reduce distress and insomnia in people with self-referred affective symptoms. *American Journal of Dance Therapy*, *35*(1), 60–77. <https://doi.org/10.1007/s10465-012-9141-y>
- Purser, R. E., & Milillo, J. (2015). Mindfulness revisited: A Buddhist-based conceptualization. *Journal of Management Inquiry*, *24*(1), 3–24. <https://doi.org/10.1177/1056492614532315>
- Quaglia, J. T., Brown, K. W., Lindsay, E. K., Creswell, J. D., & Goodman, R. J. (2015). From conceptualization to operationalization of mindfulness. In K.W. Brown, J. D. Creswell, & R. M. Ryan (Eds.), *Handbook of Mindfulness: Theory, research, and practice* (pp. 151–170). Guilford Press.
- Raphiphatthana, B., Jose, P. E., & Chobthamkit, P. (2019). The association between mindfulness and grit: An east vs. west cross-cultural comparison. *Mindfulness*, *10*(1), 146–158. <https://doi.org/10.1007/s12671-018-0961-9>
- Rau, H. K., & Williams, P. G. (2016). Dispositional mindfulness: A critical review of construct validation research. *Personality and Individual Differences*, *93*, 32–43. <https://doi.org/10.1016/j.paid.2015.09.035>
- Reffi, A. N. (2019). *Exploring the relationship between facets of mindfulness and emotion regulatory flexibility* (Publishing no. 13426406) [Doctoral dissertation, Northern Illinois University]. ProQuest Dissertations Publishing.
- Ritchhart, R., & Perkins, D. N. (2000). Life in the mindful classroom: Nurturing the disposition of mindfulness. *Journal of Social Issues*, *56*(1), 27–47. <https://doi.org/10.1111/0022-4537.00150>
- Roemer, A., Sutton, A., Grimm, C., & Medvedev, O. N. (2020). Differential Contribution of the Five Facets of Mindfulness to Well-being and Psychological Distress. *Mindfulness*, *12*(3), 693–700. <https://doi.org/10.1007/s12671-020-01535-y>
- Rowland, Z., & Wenzel, M. (2020). Mindfulness and affect-network density: Does mindfulness facilitate disengagement from affective experiences in daily life? *Mindfulness*, *11*(5), 1253–1266. <https://doi.org/10.1007/s12671-020-01335-4>
- Rudkin, E., Medvedev, O. N., & Siegert, R. J. (2018). The five-facet mindfulness questionnaire: Why the observing subscale does not predict psychological symptoms. *Mindfulness*, *9*(1), 230–242. <https://doi.org/10.1007/s12671-017-0766-2>
- Rush, J., & Hofer, S. M. (2014). Differences in within- and between-person factor structure of positive and negative affect: Analysis of two intensive measurement studies using multilevel structural equation modeling. *Psychological Assessment*, *26*(2), 462–473. <https://doi.org/10.1037/a0035666>
- Sahdra, B., Ciarrochi, J., & Parker, P. (2016). Nonattachment and mindfulness: Related but distinct constructs. *Psychological Assessment*, *28*(7), 819–829. <https://doi.org/10.1037/pas0000264>
- Sahdra, B. K., Ciarrochi, J., Parker, P. D., Basarkod, G., Bradshaw, E. L., & Baer, R. A. (2017). Are people mindful in different ways? Disentangling the quantity and quality of mindfulness in latent profiles and exploring their links to mental health and life effectiveness. *European Journal of Personality*, *31*(4), 347–365. <https://doi.org/10.1002/per.2108>
- Samani, M. N., & Busseri, M. A. (2019). Examining the link between mindfulness and temporal perspective. *Mindfulness*, *10*(12), 2647–2660. <https://doi.org/10.1007/s12671-019-01240-5>
- Sampath, H., Biswas, A. G., Soohinda, G., & Dutta, S. (2019). Mindfulness and its role in psychological well-being among medical college students. *Open Journal of Psychiatry & Allied Sciences*, *10*(1), 52–56. <https://doi.org/10.5958/2394-2061.2019.00013.2>
- Sauer, S., Walach, H., Schmidt, S., Hinterberger, T., Lynch, S., Büssing, A., & Kohls, N. (2013). Assessment of mindfulness: Review on state of the art. *Mindfulness*, *4*(1), 3–17. <https://doi.org/10.1007/s12671-012-0122-5>
- Schmidt, C., & Vinet, E. V. (2015). Atención plena: Validación del Five Facet Mindfulness Questionnaire (FFMQ) en estudiantes universitarios chilenos. *Terapia Psicológica*, *33*(2), 93–102. <https://doi.org/10.4067/s0718-48082015000200004>

- Seers, K. (2015). Qualitative systematic reviews: Their importance for our understanding of research relevant to pain. *British Journal of Pain*, 9(1), 36–40. <https://doi.org/10.1177/2049463714549777>
- Segal, Z. V., Teasdale, J. D., Williams, J. M., & Gemar, M. C. (2002). The mindfulness-based cognitive therapy adherence scale: Inter-rater reliability, adherence to protocol and treatment distinctiveness. *Clinical Psychology & Psychotherapy*, 9(2), 131–138. <https://doi.org/10.1002/cpp.320>
- Shapiro, S. L. (2009). The integration of mindfulness and psychology. *Journal of Clinical Psychology*, 65(6), 555–560. <https://doi.org/10.1002/jclp.20602>
- Shapiro, S. L., Brown, K. W., Thoresen, C., & Plante, T. G. (2011). The moderation of mindfulness-based stress reduction effects by trait mindfulness: Results from a randomized controlled trial. *Journal of Clinical Psychology*, 67(3), 267–277. <https://doi.org/10.1002/jclp.20761>
- Shapiro, S. L., Carlson, L. E., Astin, J. A., & Freedman, B. (2006). Mechanisms of mindfulness. *Journal of Clinical Psychology*, 62(3), 373–386. <https://doi.org/10.1002/jclp.20237>
- Shepherd, L. V. (2016). *Meditation in practice: A grounded theory approach to exploring mechanisms of action* [Unpublished doctoral dissertation]. California Southern University.
- Siegel, D. J. (2010). *The Mindful Therapist: A Clinician's Guide to Mindsight and Neural Integration*. WW Norton & Company.
- Siegling, A. B., & Petrides, K. V. (2016). Zeroing in on mindfulness facets: Similarities, validity, and dimensionality across three independent measures. *PLOS ONE*, 11(4), e0153073. <https://doi.org/10.1371/journal.pone.0153073>
- Solé, S., Pérez-Yus, M. C., Demarzo, M., Martínez-Rubio, D., Bravo, C., Rubí, F., & Palmi, J. (2020). What do we evaluate in sport mindfulness interventions? A systematic review of commonly used questionnaires. *Revista Iberoamericana de Psicología del Ejercicio y el Deporte*, 15(2), 157–163.
- Solem, S., Thunes, S. S., Hjemdal, O., Hagen, R., & Wells, A. (2015). A metacognitive perspective on mindfulness: An empirical investigation. *BMC Psychology*, 3(1), 24–35. <https://doi.org/10.1186/s40359-015-0081-4>
- Soler, J., Cebolla, A., Feliu-Soler, A., Demarzo, M. M. P., Pascual, J. C., Baños, R., & García-Campayo, J. (2014). Relationship between meditative practice and self-reported mindfulness: The MINDSENS composite index. *PLOS ONE*, 9(1), e86622. <https://doi.org/10.1371/journal.pone.0086622>
- Sørensen, L., Osnes, B., Visted, E., Svendsen, J. L., Adolfsdottir, S., Binder, P.-E., & Schanche, E. (2018). Dispositional mindfulness and attentional control: The specific association between the mindfulness facets of non-judgment and describing with flexibility of early operating orienting in conflict detection. *Frontiers in Psychology*, 9, 2359–2468. <https://doi.org/10.3389/fpsyg.2018.02359>
- Spinhoven, P., Huijbers, M. J., Zheng, Y., Ormel, J., & Speckens, A. E. M. (2017). Mindfulness facets and Big Five personality facets in persons with recurrent depression in remission. *Personality and Individual Differences*, 110, 109–114. <https://doi.org/10.1016/j.paid.2017.01.045>
- Sturgess, M. A. (2012). *Psychometric validation and demographic differences in two recently developed trait mindfulness measures* [Doctoral dissertation, Victoria University of Wellington, Victoria University of Wellington]. <https://researcharchive.vuw.ac.nz/xmlui/handle/10063/2569>
- Swift, J. K., Callahan, J. L., Dunn, R., Brecht, K., & Ivanovic, M. (2017). A randomized-controlled crossover trial of mindfulness for student psychotherapists. *Training and Education in Professional Psychology*, 11(4), 235–242. <https://doi.org/10.1037/tep0000154>
- Tanay, G., & Bernstein, A. (2013). State Mindfulness Scale (SMS): Development and initial validation. *Psychological Assessment*, 25(4), 1286–1299. <https://doi.org/10.1037/a0034044>
- Tang, Y. Y., Hölzel, B. K., & Posner, M. I. (2015). The neuroscience of mindfulness meditation. *Nature Reviews Neuroscience*, 16(4), 213–225. <https://doi.org/10.1038/nrn3916>
- Taylor, N. Z., & Milleer, P. M. R. (2016). Validity of the Five Facet Mindfulness Questionnaire in an Australian, meditating, demographically diverse sample. *Personality and Individual Differences*, 90, 73–77. <https://doi.org/10.1016/j.paid.2015.10.041>
- Thompson, B. L., & Waltz, J. (2007). Everyday mindfulness and mindfulness meditation: Overlapping constructs or not? *Personality and Individual Differences*, 43(7), 1875–1885. <https://doi.org/10.1016/j.paid.2007.06.017>
- Timulak, L. (2014). Qualitative meta-analysis. In U. Flick (Ed.), *The SAGE Handbook of Qualitative Data Analysis* (pp. 481–495). Sage. <https://doi.org/10.4135/9781446282243.n33>
- Tomfohr, L. M., Pung, M. A., Mills, P. J., & Edwards, K. (2015). Trait mindfulness is associated with blood pressure and interleukin-6: Exploring interactions among subscales of the Five Facet Mindfulness Questionnaire to better understand relationships between mindfulness and health. *Journal of Behavioral Medicine*, 38(1), 28–38. <https://doi.org/10.1007/s10865-014-9575-4>
- Tomlinson, E. R., Yousaf, O., Vittersø, A. D., & Jones, L. (2018). Dispositional mindfulness and psychological health: A systematic review. *Mindfulness*, 9(1), 23–43. <https://doi.org/10.1007/s12671-017-0762-6>
- Tran, U. S., Birnbaum, L., Burzler, M. A., Hegewisch, U. J., Ramazanov, D., & Voracek, M. (2022). Self-reported mindfulness accounts for the effects of mindfulness interventions and nonmindfulness controls on self-reported mental health: A preregistered systematic review and three-level meta-analysis of 146 randomized controlled trials. *Psychological Bulletin*, 148(1–2), 86–106. <https://doi.org/10.1037/bul0000359>

- Tran, U. S., Cebolla, A., Glück, T. M., Soler, J., Garcia-Campayo, J., & Von Moy, T. (2014). The serenity of the meditating mind: A cross-cultural psychometric study on a two-factor higher order structure of mindfulness, its effects, and mechanisms related to mental health among experienced meditators. *PLOS ONE*, 9(10), Article e110192. <https://doi.org/10.1371/journal.pone.0110192>
- Tran, U. S., Glück, T. M., & Nader, I. W. (2013). Investigating the Five Facet Mindfulness Questionnaire (FFMQ): Construction of a short form and evidence of a two-factor higher order structure of mindfulness. *Journal of Clinical Psychology*, 69(9), 951–965. <https://doi.org/10.1002/jclp.21996>
- Tran, U. S., Wasserbauer, J., & Voracek, M. (2020). Testing the incremental validity of dispositional mindfulness over and above the Big Five in accounting for mental health: A facet-level structural-equation modeling and predictor communality and dominance approach. *Personality and Individual Differences*, 156, 109769. <https://doi.org/10.1016/j.paid.2019.109769>
- Truijens, S. E. M., Nyklíček, I., van Son, J., & Pop, V. J. M. (2016). Validation of a short form three facet mindfulness questionnaire (TFMQ-SF) in pregnant women. *Personality and Individual Differences*, 93, 118–124. <https://doi.org/10.1016/j.paid.2015.06.037>
- Trull, T. J., & Ebner-Priemer, U. (2013). Ambulatory assessment. *Annual Review of Clinical Psychology*, 9(1), 151–176. <https://doi.org/10.1146/annurev-clinpsy-050212-185510>
- Truong, Q. C., Krägeloh, C. U., Siegert, R. J., Landon, J., & Medvedev, O. N. (2020). Applying generalizability theory to differentiate between trait and state in the Five Facet Mindfulness Questionnaire (FFMQ). *Mindfulness*, 11(4), 953–963. <https://doi.org/10.1007/s12671-020-01324-7>
- Vago, D. R., & Silbersweig, D. A. (2012). Self-awareness, self-regulation, and self-transcendence (S-ART): A framework for understanding the neurobiological mechanisms of mindfulness. *Frontiers in Human Neuroscience*, 6, 296. <https://doi.org/10.3389/fnhum.2012.00296>
- Van Dam, N. T., Earleywine, M., & Danoff-Burg, S. (2009). Differential item function across meditators and non-meditators on the Five Facet Mindfulness Questionnaire. *Personality and Individual Differences*, 47(5), 516–521. <https://doi.org/10.1016/j.paid.2009.05.005>
- Van Dam, N. T., Hobkirk, A. L., Danoff-Burg, S., & Earleywine, M. (2012). Mind your words: Positive and negative items create method effects on the Five Facet Mindfulness Questionnaire. *Assessment*, 19(2), 198–204. <https://doi.org/10.1177/1073191112438743>
- Van Dam, N. T., van Vugt, M. K., Vago, D. R., Schmalzl, L., Saron, C. D., Olendzki, A., Meissner, T., Lazar, S. W., Kerr, C. E., Gorchov, J., Fox, K. C. R., Field, B. A., Britton, W. B., Brefczynski-Lewis, J. A., & Meyer, D. E. (2018). Mind the hype: A critical evaluation and prescriptive agenda for research on mindfulness and meditation. *Perspectives on Psychological Science*, 13(1), 36–61. <https://doi.org/10.1177/1745691617709589>
- VERBI Software. (2019). *MAXQDA 2020 [computer software]*. VERBI Software.
- Walach, H., Buchheld, N., Buttenmüller, V., Kleinknecht, N., & Schmidt, S. (2006). Measuring mindfulness—the Freiburg mindfulness inventory (FMI). *Personality and Individual Differences*, 40(8), 1543–1555. <https://doi.org/10.1016/j.paid.2005.11.025>
- Watson-Singleton, N. N., Walker, J. H., LoParo, D., Mack, S. A., & Kaslow, N. J. (2018). Psychometric evaluation of the Five Facet Mindfulness Questionnaire in a clinical sample of African Americans. *Mindfulness*, 9(1), 312–324. <https://doi.org/10.1007/s12671-017-0776-0>
- Weir, S. D. (2016). *Mentalization and mindfulness: Two related constructs in theory and practice* [Unpublished doctoral dissertation]. Biola University.
- Wheeler, M. S., Arnkoff, D. B., & Glass, C. R. (2017). The neuroscience of mindfulness: How mindfulness alters the brain and facilitates emotion regulation. *Mindfulness*, 8(6), 1471–1487. <https://doi.org/10.1007/s12671-017-0742-x>
- Williams, J. M. G., & Kabat-Zinn, J. (2011). Mindfulness: Diverse perspectives on its meaning, origins, and multiple applications at the intersection of science and dharma. *Contemporary Buddhism*, 12(1), 1–18. <https://doi.org/10.1080/14639947.2011.564811>
- Williams, M. J., Dalgleish, T., Karl, A., & Kuyken, W. (2014). Examining the factor structures of the Five Facet Mindfulness Questionnaire and the Self-Compassion Scale. *Psychological Assessment*, 26(2), 407–418. <https://doi.org/10.1037/a0035566>
- Xia, T., Hu, H., Seritan, A. L., & Eisendrath, S. (2019). The many roads to mindfulness: A review of nonmindfulness-based interventions that increase mindfulness. *Journal of Alternative and Complementary Medicine*, 25(9), 874–889. <https://doi.org/10.1089/acm.2019.0137>
- Zhang, C.-Q., Chung, P.-K., & Si, G. (2017). Assessing acceptance in mindfulness with direct-worded items: The development and initial validation of the athlete mindfulness questionnaire. *Journal of Sport and Health Science*, 6(3), 311–320. <https://doi.org/10.1016/j.jshs.2015.09.010>
- Zhuang, K., Bi, M., Li, Y., Xia, Y., Guo, X., Chen, Q., Du, X., Wang, K., Wei, D., Yin, H., & Qiu, J. (2017). A distinction between two instruments measuring dispositional mindfulness and the correlations between those measurements and the neuroanatomical structure. *Scientific Reports*, 7(1), 1–9. <https://doi.org/10.1038/s41598-017-06599-w>

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