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„Can FFMQ Predict Mindfulness Usage and Helpfulness in Everyday Life? A Diary Study Using Multilevel Models"

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Abstract

Although there is a multitude of studies that document the various beneficial outcomes of mindfulness interventions in both clinical and non-clinical contexts, there is still a lack of knowledge about what determines the usage and helpfulness of each individual mindfulness facet in everyday life. This study investigates correlates of the usage and self-rated helpfulness of four mindfulness facets in everyday life: Nonjudging of Inner Experience (Nonjudge), Nonreactivity to Inner Experience (Nonreact), Acting with Awareness, and Describe. The influence of trait mindfulness (FFMQ), regular meditation practice, gender, age, and daily stress levels was investigated.

Data of 1114 participants were used for this research. Daily stress, usage, and self-rated helpfulness of mindfulness was assessed during seven consecutive days. Due to the nested structure of the data, multilevel-models were used in the analysis. Trait mindfulness was highly associated with usage and self-rated helpfulness of all mindfulness facets, especially Acting with Awareness. Regular meditation practice was not associated with the usage of mindfulness facets in everyday life, but it was positively associated with the self-rated helpfulness of Nonjudge and Nonreact. Stress was negatively associated with most of the investigated facets, in particular the ability to take a step back and not react to inner experience.

Since mindfulness is an umbrella term that contains different facets and causal mechanisms, this study encourages researchers to further investigate mindfulness on the level of its facets. Further, the proposition that regular meditation practice fosters trait mindfulness should be investigated using controlled study designs.

Deutsche Zusammenfassung

Obwohl die zahlreichen positiven Effekte von Achtsamkeitsinterventionen sowohl in klinischen als auch in nicht-klinischen Kontexten gut erforscht und dokumentiert sind, so ist dennoch unklar, welche Faktoren es beeinflussen, ob Aspekte von Achtsamkeit im Alltag angewandt und als hilfreich eingeschätzt werden. Diese Studie untersucht, welchen Einfluss Trait Achtsamkeit (FFMQ), regelmäßige Meditation, Geschlecht, Alter und Stress auf die Anwendung und hilfreich-Einschätzung von vier Achtsamkeitsfacetten haben: Nonjudging of Inner Experience (Nonjudge), Nonreactivity to Inner Experience (Nonreact), Acting with Awareness und Describe.

Daten von 1114 Testpersonen wurden für diese Forschungsarbeit verwendet. Anwendung und hilfreich-Einschätzung von Achtsamkeit sowie die Stressbelastung am jeweiligen Tag wurden über sieben aufeinanderfolgende Tage erhoben. Aufgrund der verschachtelten Datenstruktur wurden die Daten mit Multilevel-Modellen ausgewertet. Trait Achtsamkeit war stark mit der Anwendung und hilfreich-Einschätzung aller Achtsamkeitsfacetten assoziiert, im Besonderen mit Actaware. Regelmäßige Meditationspraxis war nicht mit der Anwendung von Achtsamkeitsfacetten im Alltag korreliert. Regelmäßige Meditationspraxis war lediglich mit der hilfreich-Einschätzung von Nonjudge und Nonreact assoziiert. Stress stand in negativem Zusammenhang mit der Mehrzahl der untersuchten Facetten, im speziellen mit der Fähigkeit, einen Schritt zurück zu treten und nicht automatisch auf inneres Erleben zu reagieren.

Nachdem Achtsamkeit ein Sammelbegriff ist, der unterschiedliche Aspekte und kausale Mechanismen beinhaltet, soll diese Arbeit die Forschung dazu ermutigen, Achtsamkeit noch genauer auf der Ebene der einzelnen Subfacetten zu untersuchen. Die Ergebnisse dieser Studie deuten nicht eindeutig darauf hin, dass Trait Achtsamkeit über regelmäßige Meditation gefördert werden kann. Diese weit verbreitete Annahme sollte mittels kontrollierten Studiendesigns untersucht werden.

Content

Introduction

Can FFMQ Predict Mindfulness Usage and Helpfulness in Everyday Life? A Diary Study Using Multilevel Models.

The concept of mindfulness, which originates from Buddhist philosophy, has received an increasing amount of interest by scientists all around the world in the recent years. Jon Kabat-Zinn can be considered a pioneer of mindfulness in the Western medical landscape, since he first applied the concept of mindfulness to attenuate the negative effects of a variety of medical and psychological diseases. Baer (2003) describes mindfulness as "a way of paying attention that originated in Eastern meditation practices" (p. 125). Kabat-Zinn (2003) further defines it as "the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment" (p. 145). Bishop et al. (2004) propose a model of mindfulness that encompasses two distinct components, whereby the first component is a self-directed regulation of attention towards the immediate moment by moment experience. The second component comprises a certain stance towards one's experiences, which is characterized by curiosity, openness and acceptance.

Mindfulness Interventions and Their Positive Outcomes

Currently, there are two clinical interventions that are based on mindfulness. Both, Mindfulness-Based Stress Reduction (MBSR; Kabat-Zinn, 1982, 1990) and Mindfulness-Based Cognitive Therapy (MBCT; Segal, Williams, & Teasdale, 2013) are programs that are conducted as group interventions with up to 30 participants, who meet on a weekly basis over eight weeks for 2-2.5 hours. Within those sessions, the participants practice mindfulness exercises, e.g., body scan, sitting meditation or hatha yoga. In addition to the group sessions, the participants are encouraged to practice mindfulness exercises as homework. MBSR and MBCT both are standardized programs that are led by health professionals who follow exact guidelines and protocols. MBSR was originally developed for populations with chronic pain conditions and stress-related disorders. MBCT is for the most part based on MBSR but was especially designed to prevent relapse of major depressive episodes. Teasdale, Segal and Williams (1995) suggest that persons who have suffered from major depressive episodes are more vulnerable towards mild dysphoric thoughts because these might reactivate their former depressive thinking patterns. Therefore, MBCT comprises elements of cognitive therapy that

allow a decentered perspective on one's thoughts as well as a nonjudgmental and observing attitude towards one's thoughts.

Besides the two approaches, which are almost entirely based on mindfulness skills, there are also interventions that incorporate mindfulness training alongside other components. These are Dialectical Behavior Therapy, Acceptance and Commitment Therapy, and Relapse Prevention.

Dialectical Behavior Therapy (DBT; Linehan, 1993) is an approach dedicated to the treatment of borderline personality disorder. A core element of DBT is its dialectical worldview. Linehan assumes that the world consists of opposing forces and further postulates that the most important dialectic in the therapy of borderline personality disorder is the integration of acceptance and change. The patients are encouraged to accept their current circumstances as they are, at the same time working intensively to change their behavioral patterns and aspects of their environment. Therefore, DBT contains elements of cognitive behavior therapy that are implemented to change behaviors, thoughts and emotions, whereas mindfulness skills are trained to synthesize acceptance and change.

Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 1999) is an approach that has its theoretical roots in behavior therapy and further incorporates exercises that are very similar to mindfulness exercises, but ACT uses a different nomenclature. Hayes et al. (1999) mention an observing self that can watch inner experiences such as thoughts and emotions from an outside perspective. In ACT, clients are further encouraged to defuse their thoughts and to recognize that thoughts are just observable mental events and not inevitable truths about themselves. Similar to mindfulness practices, clients are taught to observe thoughts and feelings as they arise in a non-judgmental and accepting way. Since the second pillar of ACT is value guided action to improve life, ACT therapists work with their clients on the exploration of values and on value guided action.

Third, Relapse Prevention (RP; Marlatt & Gordon, 1985) is theoretically based in cognitive-behavioral therapy, developed to prevent relapse from substance abuse. Marlatt (1994) postulates that the inability to accept the present moment and the search to escape the present moment through a "high" both play a key role in addictive behaviors. Relapse prevention programs aim to increase the patients' ability to accept the present moment. Clients learn that urges will appear consistently and how to observe the occurrence of urges in a non-judgmental way.

The rising interest of the scientific community in mindfulness can partly be explained by the multitude of beneficial effects that can be attributed to mindfulness practice. Both types of mindfulness-based therapy, namely MBSR (Kabat-Zinn, 1982, 1990) and MBCT (Segal, Williams, & Teasdale, 2002) proved to be effective against a broad range of physical and mental diseases. In a recent meta-analysis that encompassed 209 studies and more than 12,000 participants that suffered from a variety of disorders, an average effect size of Hedge's $g = 0.54$ was reported for mindfulness-based therapy (Khoury et al., 2013). The authors found mindfulness-based therapy to be particularly effective against depression, anxiety, and stress. But not only can mindfulness lower symptoms of clinical disorders, it can also be beneficial to the cognitive functioning (Jha, Krompinger, & Baime, 2007; Ortner, Kilner, & Zelazo, 2007; Pagnoni & Cekic, 2007; Slagter et al., 2007), as well as to the well-being of healthy participants (Carmody & Baer, 2008). In addition to its positive effects on the human psyche, mindfulness also has a positive effect on physical health, e.g. improved immune function (Carlson, Speca, Faris, & Patel, 2007), lower cortisol levels and a decreased blood pressure (Carlson et al., 2007). In addition to the large quantity of well-controlled studies that show impressive results on a variety of health-related outcomes, the scientific community also starts to establish understanding of the causal mechanisms of mindfulness. In the next section, some key findings in this field will be discussed.

The Causal Mechanisms of Mindfulness

Two factorial explanatory models. One common way to explain the causal mechanisms of mindfulness is to employ a two-factorial model, which is compatible to the two types of meditation. The two-factorial model of Bishop et al. (2004) distinguishes between two mindfulness factors: Self-Regulation of Attention and Orientation to Experience. *Self-Regulation of Attention* describes the orientation towards the sensations that arise in the present moment. This involves sustained attention on an object (during meditation, this is typically the breath), attention switching whenever one recognizes "mind-wandering", and the inhibition of elaborative processing of thoughts (Bishop et al., 2004). The second component, *Orientation to Experience*, describes the attitude towards one's thoughts and feelings. The attitude that is cultivated in mindfulness practice is portrayed as an open, curious, and accepting one. Furthermore, meditators tend to develop a de-centered perspective (Safran & Segal, 1990) on their thoughts and feelings. They gain insight into the nature of thoughts and experience them as transient events that come and go during meditation practice and are not necessarily objective truths but highly subjective events of the mind (Bishop et al., 2004).

Tran et al. (2013) mention that the two-factorial model is highly compatible with the common distinction between mindfulness styles: Meditation styles that stress the focus on voluntary attention on an object of choice are subsumed under the label *focused attention*, whereas *open monitoring* styles highlight the nonreactive stance towards one's moment to moment experience as it arises (Lutz, Slagter, Dunne, & Davidson, 2008).

Five factorial explanatory models. Another approach to comprehend which factors constitute the concept of mindfulness is the 39-Item Five Facet Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). The FFMQ was developed through exploratory factor analysis (EFA) of five existing mindfulness inventories and Baer et al. (2006) discovered five facets of mindfulness that load on a single higher-order factor.

Table 1

Integration of four mindfulness models: The five facets of the FFMQ, two factorial higher order structure, five mechanisms through which mindfulness exerts its effects, and associated brain regions.

FFMQ facet	Level two factor	Causal mechanism	Associated brain regions
Observe	Self-regulated Attention	Body awareness	Insula, temporo-parietal junction
Describe	Orientation to Experience and Self-regulated Attention	n.a.	n.a.
Acting with Awareness	Orientation to Experience	n.a.	n.a.
Nonjudging of Inner Experience	Orientation to Experience	Emotion regulation: reappraisal	Prefrontal Cortex (PFC)
Nonreactivity to Inner Experience	Orientation to Experience and Self-regulated Attention	Emotion regulation: exposure, extinction, and reconsilitation	Ventro-medial PFC, hippocampus, amygdala
n.a.	n.a.	Attention regulation	Anterior cingulate cortex
n.a.	n.a.	Changes in perspective on the self	Medial PFC, posterior cingulate cortex, insula, temporo-parietal junction

Note. Association of FFMQ facet (Baer et al., 2006) with level two factor (Tran et al., 2013). Causal mechanism and associated brain region following the review of Hölzel et al. (2011).

In the original study, wherein the FFMQ was introduced, Baer et al. (2006) reported that all five facets of mindfulness load on a single higher-order factor, although a single-factor higher-order structure was only valid in meditators whereas in nonmeditators, Observe was not associated with overall mindfulness. Therefore, Tran et al. (2013), following the theoretical conception of Bishop et al. (2004), proposed a two-factor higher-order structure of the FFMQ. The first factor, *Self-regulated Attention* is highly correlated with Observe, shows intermediate association with Describe and Nonreact, and shows no correlation or even negative associations

with Actaware and Nonjudge. The second factor, *Orientation to Experience* is negatively correlated with Observe and is highly correlated with the other four facets of mindfulness. Tran et al. (2013) found that only Orientation to Experience is associated with lower rates of depression, anxiety and perceived stress, which are usually seen as the important benefits of mindfulness.

A Comprehensive Model of Hölzel et al. (2011)

In their theoretical review about the causal mechanisms of mindfulness meditation, Hölzel et al. (2011) extracted four factors that are supposed to explain the positive effects of mindfulness meditation, namely attention regulation, body awareness, emotion regulation, and change of perspective on the self.

Attention Regulation. Attention regulation is a factor that is directly linked to the act of meditating itself, which is usually about not getting entangled in automatic thoughts, but whenever distractive thoughts are recognized, the attention is to be brought back to e.g. the breath. There are self-reports from meditators who reported that meditation increased their ability to focus their attention longer (Barinaga, 2003) and many empirical studies showed higher performance in attention related tasks in meditators (e.g., van den Hurk, Giommi, Gielen, Speckens, & Barendregt, 2010). Although Hölzel et al. (2011) do not relate attention regulation to Actaware (FFMQ), both conceptions describe a higher degree of attention and focus during the execution of tasks.

Body Awareness. Body awareness is considered another causal mechanism of mindfulness practice. Mehling et al. (2009) describe body awareness as the capacity to notice bodily sensations in a more detailed manner. Body awareness is assessed by the Observe scale in the FFMQ.

Emotion Regulation: Reappraisal or Nonappraisal. Another crucial causal mechanism of mindfulness is emotion regulation. In their review, Hölzel et al. (2011) differentiate between two types of emotion regulation: The reappraisal (or nonappraisal) of stressful events and the concept of exposure, extinction, and stabilization. Mindfulness meditation can lead to higher degrees of emotion regulation through positive reappraisal of stressful events. Garland et al. (2011) show that mindfulness meditation can not only lead to a more benign interpretation of stressful events; it may also facilitate a reappraisal of events as meaningful or advantageous. Hölzel et al. (2011) further point out that it is discussed by scientists whether the term reappraisal is applicable (reappraisal implies cognitive control) or whether the process of

changing appraisal is better described as nonappraisal, which implies lower cognitive control. The nonappraisal approach is backed by studies of experienced meditators who were presented unpleasant stimuli during meditation. They show higher levels of sensory processing and less contribution from prefrontal brain areas.

These findings point towards an absence of cognitive control when processing unpleasant stimuli and are also well in line with the FFMQ facet Nonjudging of Inner Experience (Hölzel et al., 2001; Baer et al., 2006).

Emotion Regulation: Exposure, Extinction, and Reconsolidation. During mindfulness meditation, experienced meditators "expose themselves to whatever is present in the field of awareness, including external stimuli as well as body sensations and emotional experiences" (Hölzel et al., 2011, p. 545). They are instructed to actively turn towards their inner experiences and emotions, even negative emotions like fear, sadness or anger. The practitioners turning towards their negative emotions, accompanied by a state of parasympathetic activity and a high degree of bodily relaxation, facilitates the extinction of the fearful stimulus (Benson, 2000). These findings are backed by a multitude of neuroimaging studies, i.e., reduced gray matter concentration in the amygdala (Hölzel et al., 2010) in the brains of experienced meditators, which plays a crucial role in fear conditioning. In the FFMQ, this aspect of mindfulness is assessed in the Nonreactivity to Inner Experience scale.

Change in Perspective on the Self. The fourth causal mechanism postulated by Hölzel et al. (2011) is a change in perspective on the self. It is deeply rooted in Buddhist teachings that the self is the product of an ongoing stream of mental events, rather than an unchanging, static entity. Rather than identifying with their thoughts and static images of self, experienced meditators develop a detached sense of self and their ability to observe their thoughts and feelings increases strongly (Olendzki, 2006). Change in Perspective on the self is the only causal mechanism postulated by Hölzel et al. (2011) that is not covered by the FFMQ.

State- and Trait-Like Qualities of Mindfulness

Since mindfulness-based interventions receive growing interest from both scientists and practitioners, it becomes more and more important to differentiate between the trait- and state-like qualities of mindfulness. A trait can be characterized as a part of a person's character or as a relatively stable behavior pattern which emerges across a variety of different situations (Hamaker, Nesselroade, & Molenaar, 2007). In contrast to that, a state refers to the interaction between person and occasion (Medvedev et al., 2017) and describes the individual adaptation

to the present moment in a certain environment (Buss, 1989; Epstein, 1984). Many authors refer to mindfulness as a state (e.g., Brown & Ryan, 2003), or as a mode in which things are done that inherits state-like qualities and can be developed through practice (Bishop et al., 2004). Theorists suggest that enhanced levels of state mindfulness during consecutive sessions of mindfulness practice may result in increased levels of trait mindfulness (Kiken, Garland, Bluth, Palsson & Gaylord, 2015). When assessing the effectiveness of mindfulness interventions, it is of special relevance to have means to differentiate between changes in trait mindfulness and state mindfulness (Medvedev et al., 2017). The aim of those interventions is to achieve changes in trait mindfulness, which are long-term effects that are supposed to last over a persistent period of time. In a recent study, Medvedev et al. (2017) proposed a promising method to distinguish between state and trait components of variance in mindfulness questionnaires. Through the usage of Generalizability Theory (Cronbach, Rajaratnam, & Gleser, 1963), they could confirm that the Toronto Mindfulness Scale (TMS; Lau et al., 2006), a measurement of state mindfulness, indeed captures almost exclusively state mindfulness variance.

In contrast to the TMS, the FFMQ was designed to capture "mindfulness as a trait in daily life" (Tran et al., 2014, p. 2).

Mindfulness Meditation and its Effects on Everyday Life

Mindfulness meditation originates from Buddhism. A core aspect of traditional Buddhist meditation practices like Vipassana and Zazen is the cultivation of mindfulness. However, in Buddhist tradition, mindfulness is not cultivated discretely but embedded in the cultivation of several states which are considered virtues, like contentment and equanimity (Phang & Oei, 2012). The cultivation of mindfulness is not restricted to traditional Buddhist mindfulness meditation techniques but can also be nourished, i.e., through body movement-oriented approaches like Yoga, Qigong or walking meditation (Caldwell et al. 2010; Schure et al. 2008). Numerous studies showed the association between self-reported mindfulness and the quantity of meditation practice. For example, Brown and Ryan (2003) found that mindfulness scores between Zen practitioners and non-meditators differed significantly. Falkenström (2010) examined a sample of Vipassana meditators and found a significant association between mindfulness and the amount of practice. Soler et al. (2014) went one step further and examined different aspects of meditative practice. Not only did they find that meditators scored higher on every subscale of the FFMQ (Baer et al. 2006) than non-meditators, they further found out that the frequency and lifetime practice of meditation were associated with mindfulness, whereas

meditation type and the typical length of a session were not correlated to mindfulness (Soler et al., 2014). Carmody and Bear (2008) further found that in MBSR, a clinical mindfulness program, the progress of the participants is highly dependent on their individual practice of meditation exercises at home.

Mindfulness in Everyday Life. Gilbert and Waltz (2010) examined the association between mindfulness, self-efficacy, and beneficial behaviors in everyday life (e.g. physical activity and a healthy diet). They found that mindfulness could predict physical activity as well as self-efficacy and fruit- and vegetable intake. They further examined the five facets of the FFMQ and their predictive value concerning health behaviors. They found that for men, the Observe subscale (the ability to notice the interconnectedness of food intake, bodily sensations, thoughts and emotions) had the strongest relation to health behaviors, whereas for women the Describe subscale (the ability to describe their thoughts and feelings) had the highest predictive value.

Friese and Hofmann (2016) used experience sampling methods to examine the association of state mindfulness in everyday life, self-regulation and the participants' dealing with desires. High state mindfulness lead to a higher enactment of desires, and less use of self-regulatory strategies (i.e., restraint, suppression, or distraction). Not only was state mindfulness associated with less feelings of guilt or regret after the enactment of temptations, but also did it not pose a threat to long-term goals. When there was a high degree of conflict between current temptations and important long-term goals, individuals with high state mindfulness were no less able to restrict themselves and enact on their long-term goals.

Mindfulness in Everyday Life and Meditation. In a recent study, Bergomi, Tschacher and Kupper (2015) investigated in high detail the association between mindfulness practice and self-reported mindfulness in everyday life. They found that continued current meditation was a better predictor for mindfulness levels than the accumulated years of meditation practice in the past.

Mindfulness, Gender, and Age

Gender Differences in Mindfulness. There are only few studies that examine gender differences in the context with mindfulness. In a recent study, investigating mindfulness from a neuroscientific standpoint, Egan, Hill and Foti (2017) discovered that gender was a moderator in the association between trait mindfulness and the neural response to affective stimuli (late positive potential; LPP). Gender differences were also found in a study that examined whether

mindfulness interventions had an impact on the response to a stress test in adolescents. Well-being and the stress response to the Trierer Social Stress Test were assessed before and after the application of a mindfulness intervention. The authors reported that women showed more engagement during the intervention and consequently showed lower stress levels afterwards (Bluth, Roberson & Girdler, 2017). Another recent study investigated gender differences concerning the outcomes of mindfulness meditation practice in college students. It was found that mindfulness meditation had more positive effects on women than on men. After the intervention females showed more positive affect, self-compassion, and mindfulness than their male counterparts (Rojiani et al., 2017). In contrast to these recent findings, many studies found the positive effects of mindfulness to be independent of gender (e.g., Kabat-Zinn, Lipworth, & Burney, 1985). A review by Katz and Toner (2013) also displayed mixed results concerning gender differences in the efficacy of mindfulness-based interventions on patients with substance use disorder. They point out that gender differences could only be found by case series and quasi-experimental study designs but could not be confirmed by a randomized controlled trial.

Age Differences in Mindfulness. Despite a general scarcity of studies investigating the relationship between mindfulness and age (Prakash, Hussain & Schirda, 2014), there are a few studies that found higher trait mindfulness in older adults than in younger adults (Hohaus & Spark, 2013; Mahoney, Segal & Coolidge, 2015).

Mindfulness and Stress

The name mindfulness-based stress reduction (MBSR; Kabat-Zinn, 1982) already points towards the main purpose of the intervention, which is to create a mindful and relaxing environment within the sessions, and to lower the impact of stressors on the participants in everyday life.

Physiological Stress Markers are influenced by Mindfulness Meditation. On a physiological level, the effects of MBSR and other types of mindfulness meditation on stress markers are well documented. A meta-analysis was conducted that summarizes the findings of randomized controlled studies that deal with the effects of meditation on physiological markers. The meta-analysis shows that different types of meditation influenced different physiological stress markers. All types of meditation lowered systolic blood pressures, cortisol was lowered by focused-attention meditation, and heart rate was lowered by open-monitoring meditation. Furthermore, there is evidence that C-reactive protein, triglycerides, and tumor necrosis factor-

alpha were also positively impacted by meditation (Pascoe, Thompson, Jenkins, Zoe, & Ski, 2017).

The Effectiveness of Mindfulness Interventions in High Stress Populations. Creswell and Lindsay (2014) built a theory upon the observation that mindfulness-based interventions are most helpful when they are applied to populations that suffer from high levels of stress, e.g., unemployed adults, and that in a clinical context, mindfulness-based interventions show the most impressive results in diseases, when onset or exacerbation of the disease is stress-related, e.g., HIV, cancerous tumor growth, cardiovascular diseases, depression, and PTSD. In their stress buffering account theory, they posit that "stress buffering effects partially or completely account for the positive effects of mindfulness on health outcomes" (Creswell & Lindsay, 2014, p. 402).

Mindfulness Interventions and Perceived Stress in Everyday Life. In a non-clinical context, Donald and Atkins (2016) investigated the relationship between mindfulness and different ways of coping with stress, namely approach coping and avoidance coping. Only in highly stressed participants did the induction of mindfulness lead to an increase in approach coping and a decrease in avoidance coping. Approach coping is associated with higher well-being (Penley, Tomaka & Wiebe, 2002), it includes responding to the stressor, and learning from stressful experiences, whereas avoidance coping encompasses strategies like denial and mental disengagement (Weinstein, Brown & Ryan, 2009).

The positive effect of mindfulness meditation on stress in non-clinical populations was further backed by two recent meta-studies. Khoury et al. (2015) found that mindfulness based-interventions had high effects on stress, and moderate effects on depression, anxiety, and quality of life. Eberth and Sedlmeier (2012) examined mindfulness meditation and found it to have a large effect on a variety of outcome variables, e.g. stress, mindfulness, intelligence, and negative personality traits. To summarize, it can be noted that a major effect of mindfulness interventions is a change in perception which leads to a perception of daily events as less stressful (Snippe, Dziak, Lanza, Nyklicek & Wichers, 2017).

Dispositional Mindfulness and Perceived Stress. Not only has science examined the effect of meditation and mindfulness-based interventions on stress, there are also studies that investigate the relationship of dispositional mindfulness and stress. Dispositional mindfulness was associated with lower levels of perceived stress (Weinstein, Brown & Ryan, 2009; Bao, Xue & Kong, 2015). In addition to lower levels in perceived stress, more mindful individuals

also showed lower reactivity to experimentally induced stress (Bullis, Bøe, Asnaani & Hofmann, 2014; Feldman, Lavallee, Gildawie & Greeson, 2016). There is evidence that high levels of perceived stress in everyday life can lead to depressive symptoms (Roberts & Kassel, 1997). Dixon and Overall (2016) showed that the connection between stress in everyday life and depressive mood was much weaker in participants with a high degree of dispositional mindfulness.

There is one qualitative study (Morone et al., 2011) that examined the way in which learnings from a mindfulness-based stress reduction course were transferred to everyday life. The authors extracted five categories by applying a qualitative content analysis to categorize the experiences of 74 participants of different MBSR courses. Amongst others, the participants reported a nonreactive way of coping with daily stressors, an increased awareness of their living in the presence, higher levels of insight and self-discovery, serenity, and a change in perspective.

Research Motivation

To summarize the current state of research, mindfulness is a psychological quality that possesses a multitude of beneficial health effects and can most likely be nurtured through meditation. The amount of current meditation practice seems to be highly associated with mindfulness levels and several studies indicate that women benefit more from the positive outcomes of mindfulness practice than men. The very few studies available on the association between mindfulness and age indicate that older persons tend to be more mindful than younger individuals. Mindfulness possesses both trait- and state-like qualities. Mindfulness as a trait describes a general tendency to be mindful that varies across individuals, whereas mindfulness as a state describes individual short-term deviations from the average. The relationship between mindfulness and stress is of complex nature. Mindfulness interventions aim at the reduction of stress levels and stress reduction is indeed their primary beneficial outcome.

Pursuing studies which examine the effect of mindfulness in everyday life (e.g., Gilbert & Waltz, 2010; Friese & Hofmann, 2016), this study aims at to examine the actual usage and self-rated helpfulness of different aspects of mindfulness in everyday life. Although preceding studies used an exploratory and qualitative approach (Morone et al., 2011), trying to filter out helpful aspects of mindfulness, no study is known to us that examines usage and self-rated helpfulness of mindfulness based on its distinct and theoretically founded facets, following the conceptualization of the FFMQ.

Research Questions and Hypotheses

This study aims at determining predictors of the usage and helpfulness of mindfulness facets in everyday life, with a special focus on the predictive value of trait mindfulness and regular meditation practice. Further, I examined the influence of gender, age, and stress on the usage and self-rated helpfulness of the four facets of mindfulness.

(a) I hypothesized that trait mindfulness is positively associated with the usage and self-rated helpfulness of mindfulness facets (Nonreactivity to Inner Experience, Nonjudging of Inner Experience, Describe, and Observe) in everyday life.

(b) I hypothesized that regular meditation is associated with the usage and self-rated helpfulness in everyday life of the two mindfulness facets whose causal mechanisms are depicted in the theoretical model of Hölzel et al. (2011): Nonjudging of Inner Experience and Nonreactivity to Inner Experience.

Recent studies indicate that women might benefit more from mindfulness interventions than men (e.g., Rojiani et al., 2017). Since there is evidence for gender differences concerning the effectiveness of mindfulness interventions, I hypothesized that there are also gender differences in an everyday life context without dedicated interventions.

(c) I hypothesized that female gender is positively associated with the usage and self-rated helpfulness of mindfulness facets in everyday life.

There are several studies that cover the relationship between mindfulness and stress in everyday life. As it was depicted before, a major outcome of mindfulness-based interventions is stress reduction. Another finding is that dispositional mindfulness leads to the perception of events as less stressful. It is nevertheless difficult to hypothesize to which degree individuals from a community sample are likely to use aspects of mindfulness according to their levels of perceived stress.

(d) I wanted to explore to which degree the perceived level of stress in everyday life influences the usage and self-rated helpfulness of mindfulness facets.

The finding that mindfulness interventions are especially helpful in populations that suffer from high stress levels in everyday life leads to the last hypothesis.

(e) I hypothesized that individuals who experience high levels of stress in everyday life will rate the usage of mindfulness facets as more helpful than their less stressed counterparts.

Methods

Participants

The sample comprised 1114 persons from the community. The sample consisted of 52.2% students and 47.8% members of the general population (non-students). The mean age in the total sample was 32.0 years, with participants ranging from 18 years to 84 years of age. It is evident that the student sample was younger ($M = 24.6$) and more homogenous ($SD = 5.7$) than the non-student sample ($M = 40.1$; $SD = 15.7$). With 52.5% women and 47.5% men, gender was almost evenly distributed. The sample was mainly recruited in Austria and Germany and consisted of German native speakers. Thus, Austrian (49.7%) and German nationality (45.0%) was most prevalent. Only 5.3% of the participants reported a different nationality (Italy: 1.3%; Switzerland: 0.7%; other European countries: 2.6%; non-European countries: 0.7%).

Table 2

Sample Characteristics

	Overall N=1114		Student N=581		non-Student N=524	
	n	%	n	%	n	%
Highest Education						
Compulsory School	52	4.7%	5	0.9%	44	8.4%
Apprenticeship, vocational training	134	12.0%	6	1.0%	127	24.2%
Higher education entr. qualification	627	56.3%	454	78.1%	172	32.8%
Bachelor's degree	134	12.0%	93	16.0%	39	7.4%
Master's degree	136	12.2%	18	3.1%	116	22.1%
PhD or higher	20	1.8%	0	0.0%	20	3.8%
Missing	11	1.0%	5	0.9%	6	1.1%
Occupation						
None	315	28.3%	250	43.0%	65	12.4%
Marginal Employment	221	19.8%	187	32.2%	31	5.9%
Part-time	131	11.8%	59	10.2%	71	13.5%
Full-time	317	28.5%	29	5.0%	285	54.4%
Other	108	9.7%	43	7.4%	64	12.2%
Missing	22	2.0%	13	2.2%	8	1.5%

Note. Original wording of German items. Apprenticeship: "Lehrabschluss";
Vocational Training: "Meisterprüfung"; Higher education entrance qualification:
"Hochschulreife"; Marginal Employment: "geringfügige Beschäftigung"

Almost two thirds of the sample (61.8%) were in a relationship or married (single: 33.9%, other: 4.3%). Table 2 shows socioeconomic attributes in greater detail. It is noticeable, that only 43.0% of the student sample were full-time students, whereas 57% of students were at least marginally employed at the same time. In the non-Student sample, 54.4% were working full time (part-time: 13.5%, unemployed: 12.4%, other or missing: 19.6%).

Table 3

Meditation Type, Meditation Experience and Practice per Day in the following (sub-) samples: Overall Sample, Non-Regular Meditators, and Regular Meditators

	Overall N=1114		No Regular Meditation N=959		Regular Meditation N=147	
	n	%	n	%	n	%
Meditation Type						
Zen	30	2.7%	13	1.4%	17	11.6%
Vipassana	7	0.6%	2	0.2%	5	3.4%
Tai-Chi	11	1.0%	6	0.6%	5	3.4%
Qi Gong	14	1.3%	5	0.5%	9	6.1%
Yoga	233	20.9%	153	16.0%	80	54.4%
TM	14	1.3%	9	0.9%	5	3.4%
MBSR	13	1.2%	10	1.0%	3	2.0%
Other	75	6.7%	52	5.4%	23	15.6%
Missing	717	64.4%	709	73.9%	8	5.4%
Meditation Experience						
less than 2 years	94	8.4%	47	4.9%	47	32.0%
2-5 years	113	10.1%	55	5.7%	58	39.5%
6-10 years	36	3.2%	19	2.0%	17	11.6%
11-20 years	23	2.1%	13	1.4%	10	6.8%
more than 20 years	24	2.2%	15	1.6%	9	6.1%
Missing	824	74.0%	810	84.5%	14	9.5%
Practice per Day						
0-15 minutes	28	2.5%	12	1.3%	16	10.9%
16-30 minutes	31	2.8%	8	0.8%	23	15.6%
31-45 minutes	8	0.7%		0.0%	8	5.4%
46-60 minutes	16	1.4%	1	0.1%	15	10.2%
61- 90 minutes	4	0.4%		0.0%	4	2.7%
90-120 minutes	3	0.3%		0.0%	3	2.0%
Missing	1024	91.9%	938	97.8%	86	58.5%

Note. Regular meditators reported regular meditation practice of at least 1 time per week Non-Regular Meditators reported either no or irregular meditation practice.

The sample was divided into two subgroups based on the reported frequency of meditation practice. The group of non-regular meditators reported meditation practice on an irregular basis, less than 1 time per week. The group of regular meditators reported a frequency of at least once per week. Table 3 shows how the overall sample and the two subgroups differ in their preferred meditation type, their meditation experience and their average daily amount of practice in minutes. It is noticeable that yoga was by far the most prevalent meditation type (54.4% in the Regular Meditators Sample and 20.9% in the Overall Sample).

Procedure

Participants were recruited in the context of a university course at the University of Vienna. Informed consent was obtained, and participants agreed to the utilization of their data in anonymized form. The participants were asked to provide socioeconomic details, data about their experience and practice of mediation, as well as to complete a multitude of psychological inventories. Subsequently, they were asked to fill in a brief diary, assessing usage and self-rated helpfulness of mindfulness facets and daily stress levels over the following seven days. From the original dataset, which included 1275 participants, only 1114 participants filled out the daily diary part.

Measures

Trait Mindfulness. Mindfulness was measured with the Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2016). The FFMQ was developed through factor analysis of five existing mindfulness questionnaires and distinguishes between five facets of mindfulness. I used a short form of the FFMQ that comprises only four items per facet. Tran et al. (2013) recommend the usage of the shortened form because it allows a reduction of the amount of questions by 49%. Further, the short form fits better to the five-factor model (Tran et al., 2013). Cronbach's alpha was between 0.71 (Nonreact) and 0.85 (Nonjudge). In this study, only the experience-oriented facets (Acting with Awareness, Describe, Nonjudging of Inner Experience, Nonreactivity to Inner Experience) were used to form a total mindfulness score and Observe was examined separately.

State Mindfulness. Table 4 not only depicts sample items from the five facets of trait mindfulness (FFMQ), but also the single item per facet that was used to assess state mindfulness while dealing with stress in everyday life. To assess mindfulness in everyday life, participants were asked to take part in the completion of a small set of items over a period of seven days.

Each of the diary questions should capture the notion of a mindfulness facet as defined in the FFMQ. Each day, the participants were asked whether (1) they found themselves able to utilize these behaviors (see Table 3), and (2) to which degree they found the same aspects to be helpful (German: "Half Mir"). They were asked to evaluate their daily experiences retrospectively each of the seven evenings.

Table 4

Facets of mindfulness in the FFMQ with sample items and the four items of the mindfulness diary study.

Facet	FFMQ Sample Item	Diary Study Item
Observe	I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.	n.a.
Describe	I can usually describe how I feel at the moment in considerable detail.	While I was dealing with stress today I was aware of my feelings.[1]
Acting with Awareness (Actaware)	When I do things, my mind wanders off and I'm easily distracted. (reverse)	While I was dealing with stress today I stayed focused and didn't get distracted.[2]
Nonjudging of Inner Experience (Nonjudge)	I believe some of my thoughts are abnormal or bad and I shouldn't think that way. (reverse)	While I was dealing with stress today I could also allow negative thoughts to happen.[3]
Nonreactivity to Inner Experience (Nonreact)	Usually when I have distressing thoughts or images, I "step back" and am aware of the thought or image without getting taken over by it.	While I was dealing with stress today I was able to inwardly take a step back.[4]

Note. Scales in the FFMQ from 1 (never true) to 5 (very often true). Scale in the diary study from 1 (not at all) to 10 (very much). [1]German: "Beim Umgang mit Stress heute wusste ich über meine Gefühle Bescheid."; [2]German: "Beim Umgang mit Stress heute blieb ich konzentriert und ließ mich nicht ablenken."; [3]German: "Beim Umgang mit Stress heute konnte ich auch negative Gedanken und Gefühle zulassen."; [4]German: "Beim Umgang mit Stress heute konnte ich innerlich einen "Schritt zurück" treten."

Daily Stress. Additionally, the participants were asked to rate their daily stress levels (German: "Heutige Stressbelastung") at the end of each day. The participants were asked to answer a single item on a 1 (none) to 10 (maximum) Likert scale.

Age. Participants reported month and year of birth. A birthdate variable was created by imputation of a specified, "average" day of birth which was set to be 15. The age variable was calculated by subtracting the birthday variable from the median day-1 of diary completion.

Regular Meditation. Participants reported the frequency of their meditation- and mindfulness practice on a 5-point Likert scale, ranging from 0 (*never*) to 5 (*four times a week or more*). A dichotomous variable for regular meditation practice was created. *Never* and *not on a regular basis* was coded 0, whereas *once a week* up to *four times a week or more* was coded 1.

The Usage of Single Items. Since it was a daily-diary study that aimed to assess two questions concerning the four facets of mindfulness each day, the use of single-item questions was indicated. By doing so, the amount of questions per day could be minimized to enhance the response rate. Single-items provide higher efficiency (Russell et al., 2004), make completion less monotonous for the participants (Gardner et al., 1998), and are therefore commonly used in experience sampling studies, diary studies, and in the field of management research (Fuchs & Diamantopoulos, 2009). Since we were aware of single items being a possible limitation, we adapted the mindfulness-related single-items from the FFMQ scale which displayed acceptable scientific quality criteria (Baer et al., 2016; Tran et al., 2013). In addition to that, the unidimensional nature of the individual mindfulness facets allowed single-item measurement (Fuchs & Diamantopoulos, 2009).

Statistical Analysis

The data was collected on different hierarchical levels. On the level of repeated daily entries (level 1), daily stress, usage of the four mindfulness facets, and helpfulness of the four mindfulness facets was assessed. On the level of the participants (level 2), regular meditation practice, gender, trait mindfulness, and the mindfulness facet Observe were assessed. To account for intraclass correlation, which is a common problem in nested designs (Kreft, 1994), the usage of multilevel models (Raudenbush & Bryk, 2002) was indicated. There are two key advantages that make multilevel models the method of choice for this kind of research. First, multilevel models do not rely on having independent observations (Field, Miles & Field, 2012), which makes their use perfectly suitable for nested data. The second main advantage is that in the case of missing data, it is not necessary to manually impute data, instead the software estimates parameters from the available data (Field, Miles & Field, 2012). The analyses were conducted using the 'Hmisc' (Harrell, Dupont, et al., 2015) and 'nlme' (Pinheiro et al., 2017) packages in R version 3.3.3 (R Core Team, 2015).

As it was mentioned above, only 1114 participants filled out the daily diary part. This accounts for a loss of 12.6% in the first place. Since the *lme()* function in the 'nlme' package cannot deal with missing values, and multilevel models do not require a balanced design, another part of participants were excluded because they completely skipped to fill out their level-2 socioeconomic data (e.g. gender, age, etc.). In the case of missing data on level-1, it was possible to exclude only data from the affected days. Because each mindfulness facet was examined separately, the impact of missing data on the particular sample sizes varied from 7244 observations in 1078 participants (describe) to 7164 observations in 1067 participants (nonjudge). This accumulates in a net loss of about 15% of the data.

Before the analysis could be run, it was necessary to transform the data from wide format (each row in the dataset represents a person) to long format, wherein each row represents a day and each person is represented by 7 rows. This was achieved via the 'melt' function from the 'reshape2' package (Wickham, 2007). By doing so, each relevant variable of the diary study was fit into one column.

Results

Model Build-Up and Model Fit

Following the recommendations of Raudenbush and Bryk (2002), the models were built up in a step-wise fashion. Since I had nested data, where the daily diary entries were nested within the individuals, the first step was to add random intercepts, which allows the intercepts of the model to vary across contexts (individuals). Second, I consecutively added fixed effects (e.g. gender, trait mindfulness, regular meditation practice, etc.) to the model. In a final step, random slopes for all level-1 independent variables were added. In the examination of the usage of the mindfulness facets stress was included as a level-1 predictor. In the examination of the self-rated helpfulness, stress and the usage of the respective mindfulness facet were added as level-1 predictors. By doing so, the slopes of each level-1 predictor could vary across contexts.

The advantage of this step-wise procedure is that it allows the comparison of goodness-of-fit indicators. Results of the -2LL tests as well as the common fit indices used in multilevel analysis are depicted in tables 5 and 6 and allow for model comparison. The primary way to compare multilevel models is to subtract the -2log-likelihood of the new model from the -2log-likelihood of the old model, which results in a χ^2 likelihood ratio test. In tables 5 and 6, log likelihood is depicted in the column logLik and the -2LL value is depicted in the column L.Ratio. Both the Akaike Information Criterion (AIC; Akaike, 1973) and the Bayesian Information Criterion (BIC; Schwarz, 1978) are also depicted in Tables 5 and 6. Both information criteria are not intrinsically interpretable but are useful for model comparison. For both AIC and BIC, smaller values indicate a better fit. Both information criteria can be described as a modified log likelihood that is adjusted for model complexity and model fit (Hamaker, van Hattum, Kuiper & Hoijtink, 2011). In each row of Tables 5 and 6, a new variable is added to the preceding model and the goodness of fit indicators compare the current model with the previous one. The model *random intercept* shows a much higher model fit than the baseline model *intercept.* Both models only use intercepts to predict the outcome variables but the second model (*random intercept*) allows different intercepts for each participant. The subsequent rows in Tables 5 and 6 show the improvement of model fit after consequently adding new fixed effects (age, gender, etc.) to the preceding model. The bottom row in Table 5 (*random stress)*, and the two bottom rows in Table 6 (*random stress, random used)* show improvements in model fit after allowing for a different slope of the effect of stress (tables 5 and 6) and the usage of the respective mindfulness facet (Table 6) for each participant.

Tables 7 and 8 show the fixed effects for the multilevel model. In Tables 7 and 8, *Intercept* explains to which degree the model fit increases by letting the intercept vary across contexts (individuals). Tables 5 and 6 further show that letting the intercept vary across contexts is the factor that increases model fit most.

Factors that Influence the Usage of Mindfulness Facets in Everyday Life

Table 7 displays the association between the examined variables and the usage of the four mindfulness facets in everyday life. The estimates of *Intercept* are higher in *Nonjudging of Inner Experience Used (NJU)* and *Describe Used (DEU)* than in *Acting with Awareness Used (ACU)* and *Nonreactivity to Inner Experience Used (NRU).* Gender and Age did not show significant associations with NRU and ACU but were associated with NJU and DEU where they showed a negative estimate. This implies that that younger individuals and females are more likely to listen to their feelings and to allow the occurrence of negative emotions in everyday life. Trait mindfulness (FFMQ) was a highly significant factor throughout all facets, estimates ranging from 0.47 (DEU) to 1.22 (ACU). The Observe facet from the FFMQ showed significant positive association with the usage of all three facets, except for the ACU facet. With estimates of about 0.3, our results show indications that regular meditation might lead to an increased usage of Nonreact and Nonjudge in everyday life. Nevertheless, the associations with regular meditation did not reach levels of significance across all four mindfulness facets. This might be the case because of a lack of statistical power due to a big surplus of non-meditators in our community sample. In our findings, stress showed no association with the usage of Nonjudge, which means it does not inhibit the acceptance of negative thoughts in everyday life. Stress showed modest negative association with ACU and DEU and we further found that the highest negative association of stress was with the usage of Nonreactivity to Inner Experience. This implies that the biggest impact of stress on the implementation of aspects of mindfulness is that it prevents people from taking a step back from their daily hassles in order to see the bigger picture.

Table 5

Usage of mindfulness in everyday-life: A comparison of the model fit after subsequently adding new variables to the multilevel models.

Fixed Effects	df	BIC	AIC	logLik	L.Ratio	p	df	BIC	AIC	logLik	L.Ratio	p
		Acting With Awareness Used						Nonjudging of Inner Experience Used				
Intercept	2	34988.83	34988.83	-17492.41			2	35857.79	35843.97	-17919.99		
Random Intercept	3	32507.83	32507.83	-16250.91	2483.00	<.001	3	32241.88	32221.16	-16107.58	3624.81	<.001
Age	4	32504.80	32504.80	-16248.40	5.02	.025	4	32248.70	32221.07	-16106.53	2.09	.148
Gender	5	32506.80	32506.75	-16248.38	0.05	.819	5	32242.71	32208.18	-16099.09	14.89	<.001
FFMQ	6	32380.23	32380.23	-16184.11	128.52	<.001	6	32237.29	32195.84	-16091.92	14.33	<.001
Observe	7	32380.76	32380.76	-16183.38	1.46	.225	7	32234.29	32185.94	-16085.97	11.90	<.001
Regular Meditation	8	32381.80	32381.80	-16182.90	0.96	.326	8	32239.75	32184.48	-16084.24	3.45	.063
Stress	9	32371.29	32371.29	-16176.64	12.51	<.001	9	32248.54	32186.37	-16084.19	0.11	.737
Random Stress	11	31568.94	31568.94	-15773.47	806.35	<.001	11	31793.04	31717.05	-15847.53	473.32	<.001

Fixed Effects	df	BIC	AIC	logLik	L.Ratio	p	df	BIC	AIC	logLik	L.Ratio	p
		Nonreactivity to Inner Experience Used						Describe Used				
Intercept	2	36282.41	36268.60	-18132.30			2	34685.21	34671.37	-17333.69		
Random Intercept	3	33344.04	33323.32	-16658.66	2947.27	<.001	3	30475.01	30454.25	-15224.13	4219.12	<.001
Age	4	33352.58	33324.96	-16658.48	0.36	.547	4	30482.76	30455.09	-15223.55	1.16	.281
Gender	5	33360.78	33326.25	-16658.13	0.70	.400	5	30474.09	30439.51	-15214.75	17.59	<.001
FFMQ	6	33305.46	33264.03	-16626.02	64.22	<.001	6	30434.13	30392.62	-15190.31	48.88	<.001
Observe	7	33280.39	33232.06	-16609.03	33.97	<.001	7	30410.05	30361.62	-15173.81	33.00	<.001
Regular Meditation	8	33286.29	33231.05	-16607.53	3.00	.083	8	30418.96	30363.62	-15173.81	0.00	.963
Stress	9	32906.08	32843.94	-16412.97	389.11	<.001	9	30401.20	30338.94	-15160.47	26.68	<.001
Random Stress	11	32416.11	32340.16	-16159.08	507.78	<.001	11	29893.15	29817.06	-14897.53	525.88	<.001

Note. BIC = Bayesian information criterion, AIC = Akaike information criterion, logLik = log-likelihood, L.Ratio = -2log-likelihood

Table 6

Helpfulness of mindfulness in everyday-life: A comparison of the model fit after subsequently adding new variables to the multilevel models.

Fixed Effects	Acting With Awareness Helped						Nonjudging of Inner Experience Helped					
	df	BIC	AIC	logLik	L.Ratio	p	df	BIC	AIC	logLik	L.Ratio	p
Intercept	2	35922.36	35908.59	-17952.29			2	35700.19	35686.44	-17841.22		
Random Intercept	3	33339.20	33318.54	-16656.27	2592.05	<.001	3	31743.83	31723.20	-15858.60	3965.24	<.001
Age	4	33336.73	33309.18	-16650.59	11.35	<.001	4	31725.18	31697.68	-15844.84	27.53	<.001
Gender	5	33345.31	33310.87	-16650.44	0.31	.578	5	31723.98	31689.59	-15839.80	10.08	.002
FFMQ	6	33275.50	33234.18	-16611.09	78.70	<.001	6	31709.20	31667.94	-15827.97	23.65	<.001
Observe	7	33278.25	33230.04	-16608.02	6.13	.013	7	31699.62	31651.49	-15818.74	18.46	<.001
Regular Meditation	8	33287.10	33232.01	-16608.00	0.04	.845	8	31700.11	31645.09	-15814.55	8.39	.004
Stress	9	33278.49	33216.50	-16599.25	17.50	<.001	9	31636.37	31574.48	-15778.24	72.62	<.001
Facet Used	10	30106.92	30038.05	-15009.03	3180.45	<.001	10	30888.51	30819.74	-15399.87	756.74	<.001
Random Stress	12	29794.40	29711.76	-14843.88	330.29	<.001	12	30627.32	30544.80	-15260.40	278.94	<.001
Random Facet Used	15	29170.88	29067.58	-14518.79	650.18	<.001	15	29794.31	29691.16	-14830.58	859.64	<.001

Fixed Effects	Nonreactivity to Inner Experience Helped						Describe Helped					
	df	BIC	AIC	logLik	L.Ratio	p	df	BIC	AIC	logLik	L.Ratio	p
Intercept	2	36383.50	36369.75	-18182.87			2	36157.03	36143.26	-18069.63		
Random Intercept	3	33284.81	33264.18	-16629.09	3107.57	<.001	3	32092.80	32072.14	-16033.07	4073.12	<.001
Age	4	33288.85	33261.34	-16626.67	4.84	.028	4	32082.73	32055.18	-16023.59	18.96	<.001
Gender	5	33293.76	33259.37	-16624.69	3.96	.047	5	32074.54	32040.10	-16015.05	17.08	<.001
FFMQ	6	33270.07	33228.80	-16608.40	32.57	<.001	6	32034.74	31993.41	-15990.70	48.69	<.001
Observe	7	33248.68	33200.54	-16593.27	30.27	<.001	7	32014.26	31966.04	-15976.02	29.37	<.001
Regular Meditation	8	33249.71	33194.69	-16589.35	7.84	.005	8	32020.84	31965.74	-15974.87	2.30	.129
Stress	9	32990.71	32928.82	-16455.41	267.88	<.001	9	31835.25	31773.26	-15877.63	194.48	<.001
Facet Used	10	28910.62	28841.85	-14410.92	4088.97	<.001	10	30675.79	30606.91	-15293.46	1168.35	<.001
Random Stress	12	28677.66	28595.13	-14285.57	250.72	<.001	12	30226.92	30144.27	-15060.13	466.65	<.001
Random Facet Used	15	27995.72	27892.56	-13931.28	708.57	<.001	15	29776.19	29776.19	-14821.44	477.39	<.001

Note. BIC = Bayesian information criterion, AIC = Akaike information criterion, logLik = log-likelihood, L.Ratio = -2log-likelihood

Table 7

Parameter Estimates for Multilevel Model: Usage of the four Mindfulness Facets in Everyday Life as a Function of Age, Gender, Mindfulness (FFMQ), Observe (FFMQ), Regular Meditation, and Stress

	Acting With Awareness Used				CI95			*Nonjudging of Inner Experience Used*				CI95	
Fixed Effects	Estimate	(SE)	t[a]	p	Lower	Upper	Estimate	(SE)	t[b]	p	Lower	Upper
Intercept	2.34	0.45	5.25	<.001	1.47	3.21	4.43	0.54	8.21	<.001	3.37	5.48
Age	0.00	0.00	0.44	.659	0.00	0.01	-0.01	0.00	-2.55	.011	-0.02	0.00
Gender	-0.06	0.10	-0.56	.575	-0.26	0.14	-0.50	0.13	-3.97	<.001	-0.75	-0.25
FFMQ	1.22	0.10	11.75	<.001	1.01	1.42	0.47	0.13	3.69	<.001	0.22	0.72
Observe	0.06	0.07	0.85	.395	-0.08	0.19	0.27	0.08	3.24	.001	0.11	0.44
Regular Meditation	-0.13	0.15	-0.89	.373	-0.43	0.16	0.32	0.18	1.73	.085	-0.04	0.68
Stress	-0.04	0.02	-2.56	.010	-0.08	-0.01	0.00	0.02	0.01	.988	-0.03	0.03

	Nonreactivity to Inner Experience Used				CI95			*Describe Used*				CI95	
Fixed Effects	Estimate	(SE)	t[d]	p	Lower	Upper	Estimate	(SE)	t[e]	p	Lower	Upper
Intercept	2.08	0.53	3.95	<.001	1.05	3.11	4.20	0.49	8.61	<.001	3.24	5.15
Age	0.00	0.00	-0.87	.383	-0.01	0.00	-0.01	0.00	-2.84	.005	-0.02	0.00
Gender	-0.05	0.12	-0.42	.675	-0.29	0.19	-0.49	0.11	-4.35	<.001	-0.72	-0.27
FFMQ	0.89	0.12	7.19	<.001	0.65	1.13	0.77	0.11	6.72	<.001	0.55	1.00
Observe	0.38	0.08	4.70	<.001	0.22	0.54	0.40	0.08	5.34	<.001	0.26	0.55
Regular Meditation	0.30	0.18	1.66	.097	-0.05	0.64	-0.04	0.17	-0.23	.818	-0.36	0.29
Stress	-0.22	0.02	-12.83	<.001	-0.25	-0.18	-0.04	0.01	-2.61	.009	-0.06	-0.01

Note. Degrees of freedom for level-1 data (Intercept and Stress) on the basis of observations, on the basis of participants for level-2 data.
[a] df = 1095, 6331; [b] df = 1092, 6291; [d] df = 1087, 6269; [e] df = 1098, 6357

Table 8

Parameter Estimates for Multilevel Model: Self-rated helpfulness of the four Mindfulness Facets in Everyday Life as a Function of Age, Gender, Mindfulness (FFMQ), Observe (FFMQ), Regular Meditation, Stress, and whether Acting with Awareness was Used

	Acting with Awareness Helped				CI95		Nonjudging of Inner Experience Helped				CI95	
Fixed Effects	Estimate	(SE)	t^a	p	Lower	Upper	Estimate	(SE)	t^b	p	Lower	Upper
Intercept	4.58	0.43	10.55	<.001	3.67	5.44	2.82	0.51	5.55	<.001	1.83	3.82
Age	0.01	0.00	1.96	.050	0.00	0.02	0.03	0.00	5.74	<.001	0.02	0.03
Gender	-0.04	0.10	-0.41	.682	-0.26	0.16	-0.18	0.12	-1.48	.140	-0.42	0.06
FFMQ	0.28	0.10	2.70	.007	0.05	0.48	0.22	0.12	1.82	.069	-0.02	0.46
Observe	0.11	0.07	1.64	.102	0.00	0.28	0.20	0.08	2.47	.014	0.04	0.36
Regular Meditation	0.07	0.15	0.50	.614	-0.18	0.43	0.43	0.17	2.47	.014	0.09	0.77
Stress	-0.02	0.01	-1.44	.150	-0.05	-0.01	-0.07	0.01	-5.72	<.001	-0.10	-0.05
Facet Used	0.67	0.02	39.44	<.001	0.65	0.69	0.36	0.02	19.17	<.001	0.32	0.40

	Nonreactivity to Inner Experience Helped				CI95		Describe Helped				CI95	
Fixed Effects	Estimate	(SE)	t^d	p	Lower	Upper	Estimate	(SE)	t^e	p	Lower	Upper
Intercept	4.83	0.42	11.47	<.001	4.01	5.65	3.55	0.53	6.75	<.001	2.52	4.57
Age	0.01	0.00	1.96	.051	0.00	0.01	0.02	0.00	4.66	<.001	0.01	0.03
Gender	-0.21	0.10	-2.13	.034	-0.39	0.00	-0.33	0.12	-2.64	.009	-0.57	-0.08
FFMQ	0.06	0.10	0.63	.532	-0.18	0.22	0.40	0.13	3.16	.002	0.15	0.64
Observe	0.10	0.07	1.55	.121	0.01	0.27	0.19	0.08	2.34	.019	0.03	0.36
Regular Meditation	0.33	0.14	2.26	.024	0.02	0.59	0.27	0.18	1.51	.132	-0.08	0.62
Stress	-0.03	0.01	-2.55	.011	-0.06	-0.02	-0.11	0.01	-7.87	<.001	-0.14	-0.09
Facet Used	0.70	0.02	46.13	<.001	0.69	0.72	0.45	0.02	23.88	<.001	0.41	0.48

Note. Degrees of freedom for level-1 data (Intercept, Stress, and Facet Used) on the basis of observations, degrees of freedom on the basis of participants for level-2 data. [a] df = 1069, 6161; [b] df = 1061, 6095; [d] df = 1061, 6099; [e] df = 1072, 6164

Table 9

Random Effects: Variability of Intercepts and Level 1 Variable Slopes across Individuals

Random Effects	Acting with Awareness Used			Nonjudging of Inner Experience Used		
	Estimate	CI_{95} Lower	Upper	Estimate	CI_{95} Lower	Upper
sd(Intercept)	2.76	2.61	2.92	2.80	2.65	2.96
sd(Stress)	0.44	0.41	0.47	0.36	0.33	0.39

Random Effects	Nonreactivity to Inner Experience Used			Describe Used		
	Estimate	CI_{95} Lower	Upper	Estimate	CI_{95} Lower	Upper
sd(Intercept)	2.94	2.77	3.11	2.53	2.39	2.67
sd(Stress)	0.40	0.37	0.43	0.34	0.31	0.37

Random Effects	Acting with Awareness Helped			Nonjudging of Inner Experience Helped		
	Estimate	CI_{95} Lower	Upper	Estimate	CI_{95} Lower	Upper
sd(Intercept)	1.51	1.44	1.60	1.70	1.61	1.80
sd(Stress)	0.29	0.26	0.31	0.24	0.21	0.27
sd(Facet Used)	-	-	-	0.46	0.43	0.49

Random Effects	Nonreactivity to Inner Experience Helped			Describe Helped		
	Estimate	CI_{95} Lower	Upper	Estimate	CI_{95} Lower	Upper
sd(Intercept)	1.36	1.28	1.44	1.81	1.72	1.91
sd(Stress)	0.22	0.20	0.25	0.33	0.30	0.36
sd(Facet Used)	0.36	0.34	0.39	0.41	0.37	0.44

Note. Missing result in Facet Used (Actaware): Software error in *intervals.lme.*

Factors that Influence the Helpfulness of Mindfulness Facets in Everyday Life

Table 8 displays the association between the examined variables and the self-rated helpfulness of the four facets in everyday life. Similar to the results of Table 7, allowing the intercept to vary across individuals provides significant improvement of the model fit. In contrast to the usage of mindfulness in everyday life, the self-rated helpfulness of the four mindfulness facets was positively associated with age. Especially the facets *Describe Helped (DEH)* and *Nonjudging of Inner Experience Helped (NJH)* were associated with age in a highly significant way, the association of age and *Acting with Awareness Helped (ACH)* and *Nonreactivity to Inner Experience Helped (NRH)* were on the threshold of significance with *p*-values of .050 and .051. When examining the gender variable, I found that not all results were significant but that there is a general tendency towards negative associations. Women significantly rate NR and DE as more helpful than men.

The trait mindfulness facet Observe was significantly correlated with the self-rated helpfulness of AC and DE. The total trait mindfulness score was not significantly associated with the self-rated helpfulness of every mindfulness facet. While NR and NJ did not show significant results, trait mindfulness was only significantly correlated with the self-rated helpfulness of AC and DE. Interestingly, it is exactly the mindfulness facets whose helpfulness is not significantly associated with trait mindfulness, where regular meditation practice plays an important role. Regular meditation practice is not only associated with a higher use of nonreactivity (taking a step back) in everyday life but also significantly influences the self-rated helpfulness of nonreactivity to inner experience and nonjudging of inner experience. Furthermore, the results reveal the influence of daily stress on the helpfulness of mindfulness. First, stress does not influence the self-rated helpfulness of Acting with Awareness. However, it negatively influences the self-rated helpfulness of the other facets, ranging from -.03(NR) to -.11 (DE). The last factor whose association with the self-rated helpfulness of the four mindfulness facets that that was examined was the usage of the respective facet. As a matter of course, it was a factor that possesses high explanatory power to explain the self-rated helpfulness with estimates ranging from .36 (NJ) to .70 (NR).

Random Effects

Table 9 (random effects) shows the variability of intercepts and level-1 variable slopes across the individuals. The row sd(Intercept) depicts the variability of the intercept across participants. First of all, it is striking that the variability of the intercept varies much more for

the usage of mindfulness facets, ranging from 2.53 (Describe Used) to 2.93 (Nonreact Used), than for the helpfulness, ranging from 2.36 (Nonreact Helped) to 1.81 (Nonjudge Helped).

The rows sd(Stress) and sd(Facet Used) show the variability of the slope of the two predictors across participants. Taking a look at the variability of the stress slope, it is again striking that the variability of the stress lope varies more for the usage of mindfulness facets, ranging from 0.34 (Describe Used) to 0.44 (Actaware used), than for the self-rated helpfulness, ranging from 0.22 (Nonreact Helped) to 0.33 (Describe Helped). This means that the influence stress has on the usage of mindfulness facets in everyday life varies more between subjects than whether they rate the usage of mindfulness facets as helpful. The variability of the facet-used slope was lowest for the helpfulness of Nonreact (0.36) and highest for the helpfulness of Nonjudge (0.46).

Discussion

Summary and Integration

In this study, I examined the predictive value of trait mindfulness, which was measured with the Five Facets Mindfulness Questionnaire (FFMQ; Baer et al., 2006, Tran et al., 2013) and several socioeconomic variables (e.g., age, gender) on the usage and self-rated helpfulness of mindfulness facets in everyday life. As a key result I found that trait mindfulness (FFMQ) was a significant predictor of the usage and self-rated helpfulness of all four examined mindfulness facets. Trait mindfulness was most highly associated with the usage and self-rated helpfulness of Acting with Awareness. The finding that the mindfulness facet Acting with Awareness, which describes the ability to stay focused and to withstand distractions, was most highly associated with trait mindfulness (FFMQ) is well in line with the findings of Donald and Atkins (2016) who found that mindfulness is associated with approach coping, a proactive and outcome-oriented stance towards problems and stressors in everyday life. So not only does trait mindfulness predict approach coping, it is also highly associated with more concentration and attentiveness during tasks of everyday life.

It was hypothesized that women would be more likely to use facets of mindfulness in everyday life. Since the usage of mindfulness was examined on the level of four sub-facets, this study can enlighten gender differences in the usage of mindfulness in a higher resolution. In addition to the study of Gilbert and Waltz (2010) who stated that for women the Describe subscale (the ability to describe their thoughts and feelings) had the highest predictive value for health behaviors in everyday life, it was found that women are more likely than men to use the mindfulness facets Describe and Nonjudging of Inner Experience in their everyday lives. Both facets in which gender differences were found are linked with emotions and the way in which participants deal with their emotions. Previous studies show that, on average, women show more emotional awareness (Barrett, Lane, Sechrest & Schwatz, 2000) and more emotional expression (Kring & Gordon, 1998) than men. In addition to these findings, our results indicate that women tend to have a higher skill set in describing their emotions as well as a higher degree of nonjudgement and acceptance towards the occurrence of negative emotions in everyday life.

The examination of the relationship between regular meditation practice and mindfulness in everyday life provides mixed results. The approach of this study differs from the multitude of studies that assessed the effectiveness of mindfulness-based interventions. This study examines the usage and self-rated helpfulness of each mindfulness facet separately in

relation to regular meditation practice without the implementation of a dedicated intervention. On the one hand, no significant result could be obtained for the relation between regular meditation practice and the usage of mindfulness facets in everyday life. Although the relationship between meditation practice and mindfulness levels is widely acknowledged (e.g., Bergomi, Tschacher and Kupper, 2015) and theoretically underpinned (e.g., Bishop et al., 2004; Hölzel et al., 2011), I could not find an association between regular meditation practice and the usage of the four mindfulness facets in everyday life. This is in line with the findings of Manuel, Somohano and Bowen (2016) who investigated the relationship between frequency and duration of meditation practice and mindfulness. They also found that neither was a total mindfulness score measured with the FFMQ, nor were the five subscales significantly associated with frequency and duration of meditation practice.

Why could this study not find a high association between mindfulness practice and mindfulness? In a recent critical evaluation of mindfulness research, Van Dam et at. (2018) propose some ideas why mindfulness interventions might produce exaggerated effects on mindfulness as an outcome variable. First, mindfulness-based interventions are accompanied by a better understanding of mindfulness related items and a different interpretation of mindfulness related questions (Baer, Samuel & Lykind, 2011). Participants might confuse a desire to be more mindful after an intervention with an actual increase of mindfulness levels (Van Dam et al., 2018). Second, social desirability might play a prominent role in mindfulness research which is embedded in mindfulness interventions. "This is because participants/patients often learn to expect/value improved attention, equanimity, and so forth, while experimenters often fail to hide their hopes that participants will grow in their adeptness at these mental faculties" (Van Dam et al, 2018, p. 44). Third, mindfulness is an "umbrella term" which is not clearly distinguishable from other psychological constructs in its semantic meaning. There is a high correlation between mindfulness and psychological constructs like emotional intelligence, emotion regulation, absent-mindedness, and many more (Baer et al., 2006). Van Dam et al. (2018) conclude that mindfulness might not be sufficiently differentiated to related, more general psychological constructs that are also positively influenced by interventions. Consequently, it is possible that some mindfulness measures partly assess general skills that are developed during various types of interventions.

In this study, regular meditation practice was only associated with the self-rated helpfulness of two mindfulness facets (Nonreactivity to Inner Experience and Nonjudgement of Inner Experience). This means that for both facets, regular meditation practice has additional

explanatory value that goes beyond trait mindfulness. It shows that (a) regular meditators benefit from an ability to step back from stressful situations and see the bigger picture more clearly than non-meditators and (b) they show more acceptance towards the negative emotions that can occur in everyday life.

The comprehensive model of Hölzel et al. (2011) theoretically underpins how mindfulness meditation facilitates the emergence of this stance towards one's emotions. Meditators train to expose themselves towards all the emotions that appear during formal practice, be they positive or negative. The exposure towards negative emotions combined with a state of bodily relaxation can lead to higher levels of extinction of negative emotions like fear or anger. The fact that meditators are instructed to approach ongoing emotional reactions in a nonjudging and accepting way leads to increased reappraisal of situations in a positive manner. Both Nonjudge and Nonreact are integrated into the higher-order causal mechanism *emotional regulation* in the theoretical model of Hölzel et al. (2011).

The examination of the relationship between age and the usage and self-rated helpfulness of mindfulness facets revealed two conflicting results. On the one hand, our results show that the usage of mindfulness facets in everyday life is almost constant throughout the lifespan. There is just a slight tendency in favor of young people who show higher levels of Describe and Nonjudge. On the other hand, the self-rated helpfulness of all mindfulness facets was higher in older participants. This finding applies in particular to the facets Describe and Nonjudge. Not only do older individuals benefit more from their ability to describe their feelings, they also seem to benefit from less self-judgement when negative thoughts appear. Considering that our overall sample consisted of a student- and a community-sample, the influence of age could also be due to the differences between student life and work life.

An estimation from Harter et al. (2003) suggests that average adults in industrialized countries spend more than a third of their waking hours at work. This is in line with the data from our community sample: about 75% of our non-student participants work part-time or more (55% full-time). Given that the average adult spends a significant amount of time at work and that the work environment accounts for a major part of the stressors experienced by adults (DeFrank & Cooper, 1987), it can be assumed that mindfulness helps adults in coping with stressors in everyday work life. Our findings that members of the workforce profit most from the ability to be aware of their emotions and to step back from automatic reaction patterns is in line with current research findings from organizational psychology. Malinowski and Lim (2015) investigated the influence of mindfulness on positive affect and work engagement. They

found that nonreactivity, the ability to take a step back and inhibit automatic reaction patterns when faced with stressors was the most central facet for the prediction of positive affect and work engagement in a work-related context.

The special role of Nonreactivity to Inner Experience could be confirmed through our examination of the relation of stress and mindfulness. Although for some facets results were below the threshold of statistical significance, I discovered a general tendency of stress inhibiting the usage and helpfulness of mindfulness facets. The most striking result was the highly negative association of stress and the usage of Nonreactivity to Inner Experiences. The results show that high stress levels in everyday life prevent people from successfully taking a step back and viewing the bigger picture. The results lead to the conclusion that the ability to step back from immediate stressors might be the most powerful antidote to high stress levels in everyday life.

Since mindfulness interventions were found to be most helpful in high-stress populations (Creswell & Lindsay, 2014) or in populations with stress-sensitive diseases (Cohen, Janicki-Deverts & Miller, 2007), it was hypothesized that stress would positively influence the helpfulness of mindfulness in everyday life. The results show that this was not the case. This study found that stress in everyday life was negatively associated with the helpfulness of mindfulness facets. The efficiency of mindfulness interventions in these populations does not mean that stress predicts the helpfulness of mindfulness facets, but that interventions like MBSR (Kabat-Zinn, 1990) work through the reduction of stress. If the habitually high stress levels of the participants prevent them from taking a step back and viewing the bigger picture, mindfulness interventions may provide a setting wherein it is possible for participants to take a step back from their daily hassles and sort out what they consider truly relevant, given their stressful conditions.

Practical Implications

First, it can be stated that the FFMQ (Five Facets Mindfulness Questionnaire) is a validated (Tran et al., 2013) instrument to assess trait mindfulness. Further it could be shown that trait mindfulness measured by the FFMQ predicts the usage and self-rated helpfulness of mindfulness facets in everyday life.

This study found that trait mindfulness was highly associated with the usage of Acting with Awareness in everyday life, which can be considered a tangible and useful outcome in

many contexts. As a result, mindfulness-based interventions can be imagined in context of schools or workplaces.

Another key finding was that the application of mindfulness facets in everyday life is rated more beneficial and helpful by older individuals. This is in line with findings that elderly people show more emotional resilience when facing increased levels of psychological stressors and declining health (Albrecht & Devlieger, 1999). Our findings indicate that fostering mindfulness could be incorporated into the care of the elderly.

Strengths and Limitations

Despite its minor limitations, there are characteristics of this study that ensure its high standards of quality, uniqueness, and novelty. To our knowledge, this is the first study that examined mindfulness by assessing the usage and self-rated helpfulness of mindfulness facets in everyday life. This was done by using a diary approach that allowed me to use a large dataset. Each participant was asked to fill in the diary form on the evenings of seven consecutive days. The usage of multilevel models allowed me to take advantage of the full depth of the dataset. Multilevel models are capable of adequately dealing with the nested structure of dependent data on level-1. Therefore, data could be examined on the level of diary entries and it was not necessary to aggregate the data over participants.

In a recent critical appraisal of mindfulness research, it was noted that there is not yet a generally accepted definition of mindfulness and that different questionnaires encompass different facets of mindfulness (Van Dam et al., 2018). Following the recommendations of the authors, who recommended using "more explicit, differentiated denotations of exactly what mental states, processes, and functions are being taught, practiced, and investigated" (Van Dam et al., 2018, p. 41), this study did not assess overall mindfulness as an outcome variable but investigated four sub-facets of mindfulness (FFMQ) in a well differentiated manner.

While many studies in the field of mindfulness research rely on student samples only (e.g., Baer et al., 2006), this study used a sample that consisted of both students and members of the community. Kabat-Zinn (2003) pointed out that mindfulness is a trait that varies sufficiently in nonmeditating and nonclinical samples, which makes the usage of student samples a valid approach. Nevertheless, the composition of the sample can be considered an advantage of this study. Further, this approach allowed the examination of the influence of age.

A central limitation of this study is the usage of one single item per mindfulness facet in the diary study. Although single items can be favored due to efficiency reasons (Russell et al., 2004) and dropout prevention (Gardner et al., 1998), the current norm in the measurement of complex psychological constructs is the creation of a questionnaire wherein multiple items represent one facet (Podsakoff & Organ, 1986). Only this procedure allows the estimation of the psychometrically important internal consistency measure that enables distinction between the psychometrical quality of items based on their fit to the underlying construct (Loo & Kells, 1998). Another crucial limitation is the cross-sectional nature of the study and the lack of an intervention which does not allow for causal interpretation of the results.

In this study I examined the association of regular meditation practice and the usage and self-rated helpfulness of mindfulness facets. Due to a lack of meditators in the total sample, it could not be distinguished between different types of meditation. Table 3 shows that 55% of the regular meditation practitioners were practicing Yoga, another 9.5% were either practicing Tai-Chi or Qi Gong, three types of bodily practice. Only a small percentage of regular meditators were practicing types of meditation (Zen 11.6%; Vipassana 3.4%; MBSR 2%) whose causal mechanisms were described within the model of Hölzel et al. (2011).

Further Research

On the one hand, I found that trait mindfulness was highly associated with the usage and self-rated helpfulness of mindfulness facets in everyday life. On the other hand, regular meditation practice was not significantly associated with the usage of mindfulness facets and significantly associated only with the helpfulness of two mindfulness facets (Nonreactivity to Inner Experience and Nonjudgement of Inner Experience) in everyday life. The finding that individuals who regularly engage in meditation practice do not differ from the community sample in their *usage of mindfulness in everyday life* points out a need to further investigate the relationship between regular meditation practice, trait mindfulness, and the implementation of mindfulness skills in everyday life. Since this study found no relationship between regular meditation practice and the application of mindfulness in everyday life, our findings challenge the assumption of mindfulness as a psychological quality or skillset that is nourished by regular meditation practice (e.g., Brown & Ryan, 2003; Caldwell et al., 2010; Schure et al. 2008; Falkenström, 2010).

Further research should examine this relationship, considering the different types of meditation and differentiate between the two theoretically distinguishable types of meditation

(focused attention, and open monitoring; Lutz et al., 2008) and the more bodily approaches like Yoga, Tai-Chi or Qi Gong. Further research projects should conduct controlled intervention studies with long-term follow-up assessments of trait mindfulness, including its usage and helpfulness in everyday life to examine the proposition that trait mindfulness could be cultivated through meditation practice.

Recent estimations suggest that only a minority of studies that assess the effectiveness of mindfulness interventions used control groups (20% used wait-list controls, 9% used active control groups) as a reference for the efficacy of mindfulness-based interventions (Dimidjian & Segal, 2015). Consequently, randomized controlled studies are not only necessary for the investigation of the causal mechanisms of mindfulness but also for the assessment of its clinical efficacy.

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Tables

Appendix

Example of R Syntax: Model Build-Up for the variable NonjudgeHelped

```
NJH_InterceptOnly <- gls(NonjudgeHelped ~ 1, data = SampleNonjudge, method = "ML", na.action = na.exclude)

NJH_RandomInterceptOnly <- lme(NonjudgeHelped ~ 1, data = SampleNonjudge, random = ~1 | ID, method = "ML", na.action = na.exclude)

NJH_1Age <- lme(NonjudgeHelped ~ Age, data = SampleNonjudge, random = ~1 | ID, method = "ML", na.action = na.exclude)

NJH_2Gender <- lme(NonjudgeHelped ~ Age + Gender, data = SampleNonjudge, random = ~1 | ID, method = "ML", na.action = na.exclude)

NJH_3FFMQ <- lme(NonjudgeHelped ~ Age + Gender + FFMQ , data = SampleNonjudge, random = ~1 | ID, method = "ML", na.action = na.exclude)

NJH_4Observe <- lme(NonjudgeHelped ~ Age + Gender + FFMQ + Observe, data = SampleNonjudge, random = ~1 | ID, method = "ML", na.action = na.exclude)

NJH_5RegularMeditation <- lme(NonjudgeHelped ~ Age + Gender + FFMQ + Observe + RegularMeditation, data = SampleNonjudge, random = ~1 | ID, method = "ML", na.action = na.exclude)

NJH_6Stress <- lme(NonjudgeHelped ~ Age + Gender + FFMQ + Observe + RegularMeditation + I(Stress - mean(Stress)), data = SampleNonjudge, random = ~1 | ID, method = "ML", na.action = na.exclude)

NJH_7NonjudgeUsed <- lme(NonjudgeHelped ~ Age + Gender + FFMQ + Observe + RegularMeditation + I(Stress - mean(Stress)) + I(NonjudgeUsed - mean(NonjudgeUsed)), data = SampleNonjudge, random = ~1 | ID, method = "ML", na.action = na.exclude)

NJH_8RandomStress <- lme(NonjudgeHelped ~ Age + Gender + FFMQ + Observe + RegularMeditation + I(Stress - mean(Stress)) + I(NonjudgeUsed - mean(NonjudgeUsed)), data = SampleNonjudge, random = ~I(Stress-mean(Stress)) | ID, method = "ML", na.action = na.exclude)

NJH_9RandomUsed <- lme(NonjudgeHelped ~ Age + Gender + FFMQ + Observe + RegularMeditation + I(Stress - mean(Stress)) + I(NonjudgeUsed - mean(NonjudgeUsed)), data = SampleNonjudge, random = ~I(Stress-mean(Stress)) + I(NonjudgeUsed-mean(NonjudgeUsed)) | ID, method = "ML", na.action = na.exclude)

str(TotalSample2)

anova(NJH_InterceptOnly, NJH_RandomInterceptOnly, NJH_1Age, NJH_2Gender, NJH_3FFMQ, NJH_4Observe, NJH_5RegularMeditation, NJH_6Stress, NJH_7NonjudgeUsed, NJH_8RandomStress, NJH_9RandomUsed )

summary(NJH_9RandomUsed)
```