

## 2. Measuring Mindfulness in Insight Meditation (Vipassana) and Meditation-Based Psychotherapy: The Development of the Freiburg Mindfulness Inventory (FMI) by Nina Buchheld<sup>1</sup>, Paul Grossman<sup>2</sup> and Harald Walach<sup>3</sup>

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### Summary:

Mindfulness meditation research has in recent years become a burgeoning field of investigation, particularly related to treatment of health-related disorders. Nevertheless, the construct of mindfulness has not yet been subjected to scientific validation. The aim of this study has been the empirical analysis of the Buddhist concept of mindfulness and the construction of a measurement scale that operationalizes the construct. The stages of development of a self-evaluative mindfulness inventory are presented in three phases: 1. construction of a pool of items, 2. expert assessment of items, and 3. validation by means of a study in which a preliminary form of a questionnaire was given to four samples of individuals participating in insight meditation retreats; a pre-retreat (n=100), post-retreat (n=93) design was employed. Cronbach alpha reliability coefficients of the 30-item final questionnaire were 0.91 before the course and 0.94 after. For each time of inventory completion, a four-factor solution was found using principal components factor analysis. Factor structure was only moderately stable over time. The four factors primarily reflected the theoretical and conceptual characteristics of mindfulness. Our data indicates one-dimensionality of the construct and the presence of a general factor. The mindfulness inventory provides an economic, valid, homogeneous and reliable instrument, which could be optimized and employed in further research studies.

*Keywords: Mindfulness Meditation, Insight Meditation, Vipassana, Measurement Instrument, Questionnaire, Assessment*

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## Introduction

The concept of mindfulness<sup>1</sup> and the practice employed to develop mindfulness are central to those forms of meditation deriving from the earliest Buddhist scriptures. This meditation tradition, still surviving today in the Theravada branches of Southeast Asia, is known as insight meditation (Vipassana in the original Pali), sometimes referred to as mindfulness meditation. Because of the rich psychological ramifications of the concept, mindfulness may constitute a fundamental bridge between Buddhism and Western clinical psychology or psychotherapy. The Buddhist notion of mindfulness has, in fact, gained entry, both explicitly and implicitly, into different psychotherapies, especially humanistic and depth-psychologically oriented approaches (e.g. Bohus & Wagner, 2000; Boorstein, 1997; Epstein, 1996; Galuska & Galuska, 1999; Linehan, 1996; Teasdale, 1999; Welwood, 1983). Recent studies additionally suggest clinical and therapeutic benefits of mindfulness meditation for a number of physical, psychological and psychosomatic disorders (e.g. Kabat-Zinn et al., 1992; Majumdar, 1998; Miller, Fletcher & Kabat-Zinn, 1995; Scholz, 1992; Studer, 1999). Furthermore, the use of mindfulness meditation may provide a cost-effective treatment for coping with a range of organic and non-organic diseases and syndromes (Miller et al., 1995, Teasdale, 1999).

Despite numerous promising developments, the construct of mindfulness has not yet been sufficiently examined or operationalized in an empirical manner. This article derives from a Masters thesis research (Buchheld, 2000) aimed at the construction of a valid self-report instrument for the measurement of mindfulness.

### What is mindfulness?

Mindfulness is the moment-to-moment “attentional, unbiased observation of any phenomenon in order to perceive and to experience how it truly is, absent of emotional or intellectual distortion” (Solé-Leris, 1994, p. 26). Mindfulness relates to all sensory, perceptual, emotional and other mental processes available to awareness in the here-and-now (of course, one cannot be mindful of those mental processes that clearly lie beyond our conscious experience, such as computational processes performed by our brains that remain beyond conscious awareness). Thus the territory of mindfulness includes all experience, ranging from simple, but perceptible, sensory events to more complex mental content available to direct experience, such as emotions, thoughts, images and memories. The hallmark of mindfulness is the dispassionate, non-manipulative participant-observation of ongoing mental states, without lapsing into conceptualizations about momentary mental content or becoming lost in emotional reactions. Hence, in the ideal state, attention is drawn only to the bare facts of moment-to-moment awareness without judgement, interpretation or reaction. The art is neither to suppress the immediate experience nor to attempt to maintain it. This implies a mode not unlike naturalistic observation in the sciences: one closely monitors mental phenomena as they arise and recede, and this observation is carried out with curiosity and without bias or expectation. By definition, mindfulness can only dwell in the present, immediate moment; one can be neither mindful of the past, which resides in memory, nor the future, which is not yet in the realm of actual experience.

According to Buddhist concepts of the psyche, normal human experience is not typically mindful, and mindfulness can only be gradually acquired over weeks, months and years by means of regular and systematic meditation practice both under solitary, retired conditions

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<sup>1</sup> The Buddhist construct of mindfulness is somewhat at variance and should not be confused with another conception of mindfulness prevalent in the psychological literature (e.g. Langer, 1989).

and in the real world. This developmental learning process is reflected by the common experience of novice meditators that the mind quickly wanders away from the immediate object of attention and gets caught up in thoughts and emotions pertaining to past and/ or future. Enhanced capacity and experience of mindfulness will, according to Buddhist psychology, lawfully lead to enhanced insight, as characterized by increased differentiation of the self-concept, a fresh alertness and curiosity to all experience ('beginner's mind'; Suzuki, 1975), more accurate perceptions of inner state and emotions, decreased emotional reactivity and negative affect, and a greater sense of compassion for and connection to others. Of fundamental import to the Buddhist view, advanced practice of mindfulness culminates in a kind of direct knowledge derived from training that transcends intellectual realms and provides clear and abiding recognition of the impermanence of all existence, as well as discernment of the complex and dynamic interdependence of the creation, maintenance, and dissolution of all natural phenomena (Nyanatiloka, 1981). Ultimately, Buddhist tenets maintain that human suffering is derived from deluded and uninformed perceptions regarding our selves and our transactions in the world.

## The Techniques

The methods of insight meditation used to promote the development of mindfulness are based on the oldest Buddhist Pali Canons containing discourses directly attributed to the Buddha (5<sup>th</sup> to 6<sup>th</sup> century B.C.). They mainly derive from the *Discourse on the Four Foundations of Mindfulness* and the *Discourse on Full Awareness of Breathing* (Gruber, 1999). A systematic program in the development of mindfulness focuses first upon body awareness and sensate experience, then gradually expands to more complex perceptions, emotions and other mental states (e.g. thoughts, images, and memories).

Observation of naturally occurring breathing (i.e. not consciously altered) often constitutes at least the first stages of meditation. Attention is typically directed to a specific point where the entire respiratory cycle can be easily experienced, e.g. the rising and falling of the abdominal wall or the breath passing through the nostrils.

Breathing can serve as an anchor to mindfulness since it provides a bridge between body and mind that is vital and continuous (Allmen, 1990). Additionally, because breathing is so exquisitely sensitive to emotional state, as well as to subtle variations in mental and physical activity, full moment-to-moment attention to the breath can lead to an overall awareness of all perceptible mental processes (Grossman & Wientjes, 2001).

In the mindfulness practice all mental phenomena entering awareness are treated equally, whether pleasant, unpleasant or neutral. This implies a curious but dispassionate intention, an emphasis upon openness, acceptance and non-avoidance toward whatever arises in consciousness, and an orientation to mental content as the only momentary reality in a continuously changing theatre of the mind.

Observation of the arising and passing away of objects of awareness is aimed at a seamless continuity of moment-to-moment mindfulness without becoming distracted by or absorbed in specific content of mental events (Brown & Engler, 1988). With increased faculties of sustained attention, this practice of awareness can be expanded to a state of 'choiceless awareness', where any and all experiences can be included as objects of observation (Allmen, 1997). In the United States, insight meditation represents the most popular method of Buddhist meditation (Gruber, 1999).

## Major aims

The main aims of this investigation were a) to empirically evaluate, within a multi-factorial framework, the construct of mindfulness and b) to develop a self-report inventory that

operationalizes mindfulness in a sensitive, valid and reliable manner, which could be used in future research.

## Methods

### 1. The item pool

The initial step was to create a pool of terms and items descriptive of mindfulness. A systematic survey was, therefore, made of a substantial body of English and German language book and magazine literature dealing with insight meditation. Our survey included literature from reading lists of major teaching centers of insight meditation (e.g. Waldhaus, Buddhahaus, Gaia House, Deutsche Buddhistische Union); periodicals (e.g. the journals, ‚Lotusblätter‘ and ‚Inquiring Mind‘); and the writings of numerous experts on Buddhism and mindfulness from around the globe (e.g. Allmen, 1990, 1997; Ayya Khema, 1987; Epstein, 1996; Hart, 1996; Goldstein, 1996; Kabat-Zinn, 1996, 1998; Kornfield, 1995, 1996; Levine, 1997; Nyanaponika, 1993; Thich Nhat Hanh, 1996, 1999; Titmuss, 1999; Wetzels, 1998). Additionally, items from an unpublished inventory, the ‘Experiences Questionnaire’ (Teasdale et al., 1997), translated to German (Majumdar and Schmid: *Fragebogen zur Erfassung von Erfahrung und Erleben*) were also included in the initial pool of items. Emphasis was placed upon identifying items that characterize specific cognitive, affective and behavioral attributes of mindfulness.

After comprehensive review and categorization, a total of 73 items were included for the first stage of evaluation.

### 2. Expert evaluation of item pool

Eight experts<sup>2</sup> from German-speaking countries, most of whom are teachers of insight meditation, agreed to evaluate each of the items from the pool for appropriateness of formulation, accuracy of content, ease of comprehension, and specificity for characterization of mindfulness. The experts also provided their own suggestions of improved formulations, which were additionally included in the next phase. A total of 38 items resulted from the expert evaluation.

### 3. Research testing of the preliminary instrument

The 38-item inventory was then evaluated by participants at four German-speaking insight meditation retreats, held between May and August 1999. Participants were requested to fill out the inventory twice, once at the beginning (t1) and once at the end (t2) of their retreats. The intervals between initial and second completion of the questionnaire varied from three to fourteen days, depending upon the total length of the retreat.

The daily retreat schedule typically consisted of alternating 45-minute periods of sitting and walking meditation, interrupted by meals, about seven to eight hours of sleep and one hour of chores. Eating and chores were also approached with an intention of mindfulness. The total duration of sitting and walking meditation practice always exceeded eight hours daily. In the evening, teachers presented one-hour lectures about various aspects of the meditation practice. Silence was maintained for the duration of the retreat, except for occasional, brief group and individual interviews with the teachers (approximately every second day).

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2 Fred von Allmen, Dorothea Galuska, Sylvia Kolk, Paul Köppler, Ulrich Küstner, Marie Mannschatz, Sylvia Wetzels, Annabelle Dagmar Zinser

#### 4. Construction of the preliminary version

The questionnaire is constructed as a quantitative procedure for the self-evaluation of mindfulness. A final version was reduced to 30 items from the original 38 (see below for details). Items are formulated as descriptive statements that characterize various attributes of mindfulness. Frequency of reported experiencing of each descriptive item during a specific previous timeframe resulted in the following four-point scale: 'almost never', 'occasionally', 'fairly often', and 'almost always'. Instructions to the retreatants were as follows: During the initial pre-retreat completion of the Inventory (t1), participants were asked to consider the entire previous two-week period. The second questionnaire completion (t2) referred to the last 2-7 days of depending upon the duration of the retreat.

Seven items were phrased in reverse to assess bias toward positive responding (i.e. 'almost never' indicated the highest 'mindfulness' scores for these items). The total score was, therefore, a sum of the individual items (4 = greatest mindfulness, i.e. the higher the scores, the greater the extent of mindfulness according to our operationalization of the construct). The order of item presentation was random. At the end of the questionnaire, sociodemographic questions were included pertaining to age, gender, religious affiliation, occupation, family constellation, living situation and insight meditation practice (number of years, frequency and duration of regular practice).

#### 5. Results

77.9% of queried retreat participants returned completed questionnaires at t1, and 75.8% at t2. The total sample included 115 participants, of which 100 questionnaires were validly filled out for t1, and 93 for t2. 79 subjects completed both pre- and post-treatment inventories. The total sample (n=115) consisted of 79 women (69%) and 36 men (31%). Mean age was 43 years (range = 22-61 years).

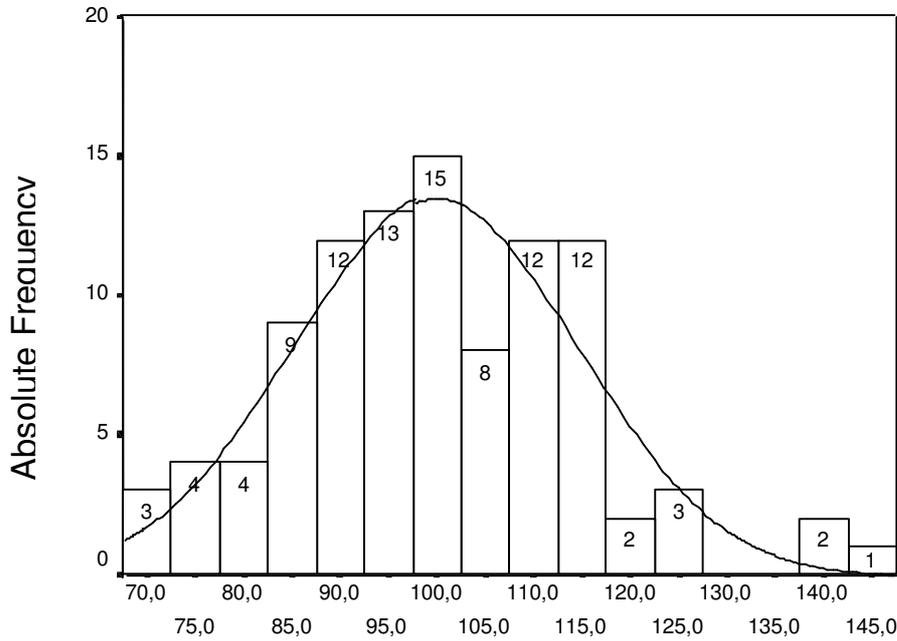
Health-care professions (e.g. psychologists, physicians, physiotherapists, or social workers) were heavily represented in the sample: 44% of females and 22% males were trained in this field. More than half the participants were single (61%; 19% married and 18% currently divorced); 47% lived with partners, 10% in small living communities, and 42% alone.

Religious affiliations were as follows: 38% no religion, 20% protestant, 16% catholic and 19% Buddhist. Of those acknowledging a religious affiliation, 51% reported actively practicing their religion, 22% reported not practicing, and 18% provided no information. Participants reported an average of five years of insight meditation experience (range 0-22 years); 21% had been practicing less than one year, 12% 1-2 years, 19% 2.5-4 years, 18% 4.5-7 years, 21% more than 7 years, and 4% more than 15 years. Regarding regularity of practice, 8% reported meditating more than once per day, 28% once daily, 29% 2-3 times per week, 4% once per week, and 23% answered with the category 'other'. The average weekly duration of meditation practice was 2.7 hours (range 0-14 hours weekly); 26% practiced less than one hour per week, 23% 1.25-2.5 hours, 23% 3-5 hours, 12% more than 5 hours, and 3% more than 9 hours.

6. Development of the final form of the inventory and presentation of data

**Figure 1. Distribution of total mindfulness scores for 38-item form at t1 (N=100)**

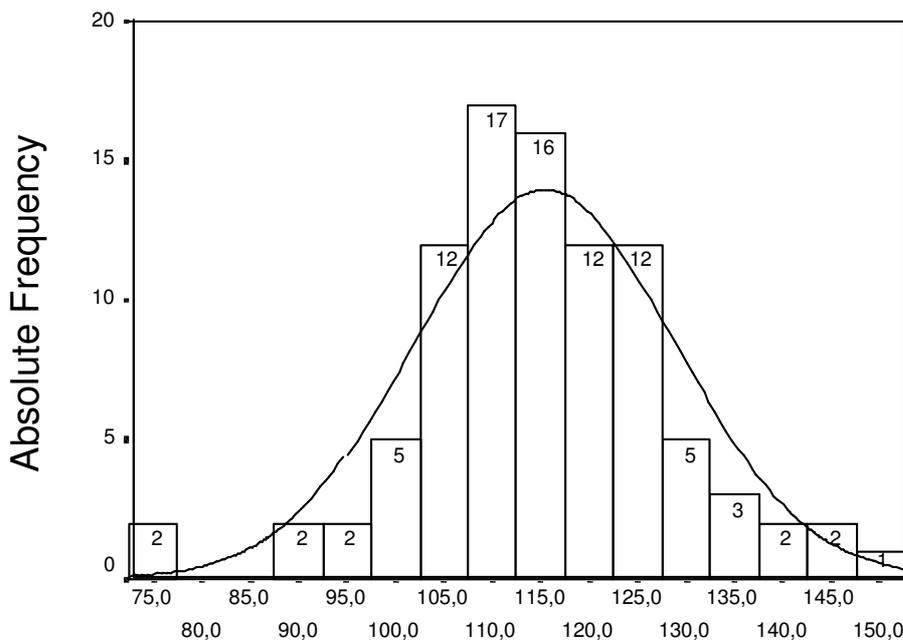
Note: Individual frequency bars represent a 10-point range of score. Numbers on X-axis represent middle values for each category.



Total score of preliminary inventory (38 Items)

**Figure 2. Distribution of total mindfulness scores for 38-item form at t2 (N=93)**

Note: Individual frequency bars represent a 10-point range of score. Numbers on X-axis represent middle values for each category.



Total score of the preliminary inventory (38 Items)

Table 1. Major statistical characteristics of total mindfulness scores for 38-item form at t1 (N=100) and t2 (N=93)

Total Score	t1	t2
Mean	100	115
Standard Deviation	14.64	13.33
Possible Range	38 – 152	38 – 152
Actual Range	71 – 146	73 – 148
Skewness	.38	-.22
Kurtosis	.43	1.52

Figures 1 and 2 present distributions of total mindfulness scores at times t1 and t2 for the 38-item preliminary form. Both reveal normal distributions for both t1 and t2 assessments (skewness =.38 at t1, -.22 at t2; kurtosis =.41 at t1, 1.52 at t2). The Kolmogorov-Smirnov test yielded  $Z = .540$  (t1) and  $Z = .696$  (t2),  $p$ 's = .932 (t1) and .718 (t2), also supporting the normality of distribution at each measurement time. Table 1 presents statistics for total scores of pre- and post-retreat measurements.

The average mindfulness score at t1 was 100. This was comparable to a mean value of 2.63 per item (including all 38 items of the preliminary form), which fell between categories of 'occasionally' and 'fairly often'. A comparison of the possible range of scores with the actual one indicated a difference on the lower end of the scale (38 vs. 71, respectively). The mean mindfulness score at t2 was 115, fully a standard deviation higher than the value preceding the retreat. The average score for individual items was, therefore 3.01, corresponding to the answer category of 'fairly often'. Consistent with expectations, our construct of mindfulness increased significantly from before to after the meditation retreat (Wilcoxon Matched pair test,  $Z = -6.99$ ,  $p < .001$ ).

The third phase of instrument construction pertained to item analysis and elimination of further items based on criteria of (1) adequate correlation of individual items with the total scale, and (2) item difficulty (i.e. eliminating items that showed extreme means and zero or near-zero variances). During this phase, the total number of items was reduced from 38 to 30. Individual item-total scale correlation coefficients were required to exceed 0.40, and item difficulty was set at a maximum of 0.80 for t1 and 0.90 for t2. The criteria for item-total scale correlation coefficients was in excess of the general minimum requirement of .30. Typically the criteria for item difficulty lie between 0.20 and 0.80 (Bortz & Döring, 1995). However, because we expected that mean mindfulness scores would be higher at t2, we increased criterion to .90 for the second measurement. There was no need to set a lower limit for item difficulty, since the minimum value was .55, well within the mid-range of acceptability. After elimination of the eight items not meeting these selection criteria, psychometric properties and factor analysis of the final scale for t1 and t2 was once again performed to assure that criteria of validity and reliability were maintained. The final version of the FMI is presented in Appendix 1.

Estimation of the Cronbach alpha statistic revealed high internal consistency of the final version of the inventory for both t1 and t2, 0.93 and 0.94, respectively. The mean inter-item correlations were 0.32 and 0.33 for the two measurement times, also indicating homogeneity of the scale. The average item difficulty was 0.64 and 0.74 for t1 and t2, respectively.

The item-total scale correlation coefficients provide information about how well specific items distinguish between those individuals with low vs. high total mindfulness scores. Below are those items with highest and lowest correlations with the total scale for 30-item final form:

The six items with highest correlation with the total scale (>0 .65) for both t1 and t2:

- Item 18: I perceive my feelings and emotions without having to react to them.
- Item 24: I am friendly to myself when things go wrong.
- Item 2: I know that I am not identical to my thoughts.
- Item 11: I watch my thoughts without identifying with them.
- Item 25: I watch my feelings without becoming lost in them.
- Item 22: I accept unpleasant experiences.

The six items with lowest correlation with the total scale (< 0.45) for both t1 and t2:

- Item 12: I observe how my thoughts come and go.**
- Item 19: I accept myself as I am.
- Item 8: I pay attention to what's behind my actions.**
- Item 16: I see how I create my own suffering.
- Item 15: I consider things from different perspectives.
- Item 29: I am impatient with myself and with others.

## 7. Factor Analysis of the Final Version

The factor structure of the final version of the 'Freiburg Mindfulness Inventory' (FMI) was separately determined for each point of administration by means of a principal components factor analysis with Varimax rotation. An optimal four-factor solution was derived for both measurement times, with the four extracted factors representing 53-54 % of the total variance. Table 2 presents all 30 items of the final FMI for the initial administration (t1), and corresponding factor loadings and communalities. A similar table for t2 is presented in the Appendix 2.

Table 2. Four-factor principal-components solution (Varimax rotation) for first administration, t1 (N=100)

Item No.	Statement	I	II	III	IV	h2
Factor I: Present-moment disidentifying attention						
4.	<b>When I notice an absence of mind, I gently return to the experience of the here and now.</b>	.73				.61
9.	<b>I easily get lost in my thoughts and feelings.</b>	.71	(.31)			.67
13.	I let my thoughts run away with me.	.70				.56
25.	I watch my feelings without becoming lost in them.	.66				.56
18.	I perceive my feelings and emotions without having to react to them.	.62			(.36)	.59
11.	I watch my thoughts without identifying with them	.62				.53
21.	I feel connected to my experience in the here-and-now.	.58	(.36)			.54
12.	I observe how my thoughts come and go.	.57				.37
2.	<b>I know that I am not identical to my thoughts.</b>	.57		(.41)	(.44)	.68
3.	I sense my body, whether eating, cooking,	.52				.40

	cleaning or talking.					
6.	I notice how my emotions express themselves through my body.	.49		(.40)		.47
26.	In difficult situations, I can pause without immediately reacting.	.39	(.33)		(.34)	.40
Factor II: Nonjudgemental, nonevaluative attitude toward self and others						
19.	I accept myself as I am.		.80			.67
24.	<b>I am friendly to myself when things go wrong.</b>		.79			.73
5.	I can appreciate myself.		.70			.55
30.	I am able to smile when I notice how I sometimes make life difficult.		.55	(.30)	(.39)	.55
17.	<b>I see my mistakes and difficulties without judging them.</b>	(.33)	.54			.50
1.	I am open to the experience of the present moment.		.50		(.43)	.52
29.	I am impatient with myself and with others.	(.44)	.45			.42
Factor III: Openness to negative mind states						
20.	I examine unpleasant, as well as pleasant, sensations and perceptions.			.76		.69
7.	I remain present with sensations and feelings even when they are unpleasant or painful.			.75		.66
16.	I see how I create my own suffering.			.65	(.42)	.61
8.	I pay attention to what's behind my actions.			.53		.43
27.	I avoid unpleasant feelings.		(.38)	.44		.40
22.	I accept unpleasant experiences.		(.34)	.42	(.36)	.50
Item No.	Statement	I	II	III	IV	h2
28.	I experience moments of inner peace and ease, even when things get hectic and stressful.	(.32)	(.31)	.38		.37
Factor IV: Process-oriented, insightful understanding						
15.	<b>I consider things from different perspectives.</b>				.77	.63
10.	I notice that I don't need to react to whatever pops into my mind.				.60	.56
14.	I am aware how brief and fleeting my experience is.	(.45)			.56	.53
23.	I observe how experiences arise and fade away.	(.41)			.50	.47
Explained Variance % (total: 53.9 %)		35.2	7.3	6.4	5.0	

Convergence of rotation occurred after 7 iterations. Factors I – IV are presented in columns 3-6; Communalities, h2, in column 7.

Factor I at t1 describes one of the most central components of mindfulness: Attention to the present moment without personal identification with the experience at hand. This may

be described as a sense of direct and unmediated experience of the present moment without becoming distracted by or lost in thoughts and feelings and without identifying with those mental states that occur. The mindfulness practice of paying attention to constantly fluctuating bodily sensations (e.g. the breathing pattern) serves to facilitate awareness of the present moment. Additionally, experience of the brevity and fleetingness of sensory experience may promote a more dynamic sense of experience in which mental events are seen as just mental events rather than as static aspects of the self. This has been sometimes referred to as disidentification, or nonidentification, in that the normal identification with thoughts and feelings gives way to a more process-oriented consciousness. According to Buddhist psychology, development of this form of moment-to-moment disidentifying type of attention should lead to reduced psychological reactivity and bring about more appropriate responses to a range of affective stimuli. This first factor accounted for 35.2% of the total variance. The internal consistency (Cronbach's alpha) for t1 was 0.90.

Items in Factor II primarily represent a nonjudgmental, nonevaluative attitude toward self and others. This involves unconditional acceptance of one's self, including one's own weaknesses, failures and unfortunate experiences. According to Buddhist views, this approach is characterized by patience, tolerance and openness to others' and to one's own experiences. Such a nonevaluative and accepting (but not passive) inner quality is believed to enable the individual to confront with greater equanimity and even humor those inevitable occasions of personal suffering, disability and loss. Factor II accounted for 7.3% of the total variance with an internal consistency of 0.82.

Factor III reflects aspects of openness to one's own negative and positive sensations, perceptions, mood states, emotions and thoughts. This is indicated by an openness to exploring unpleasant and even painful mental states. Buddhist psychology maintains that such baring and nonevaluative experiencing of negative, as well as neutral and positive, mind states in the present moment is essential to personal development and provides insight into how suffering is caused. Factor III explained 6.4% of the total variance, with an internal consistency of 0.81.

Factor IV is composed of items that reflect a process-oriented, insightful understanding of experience at a more general level than immediate experience. This factor suggests insight into the very nature of experience as multidimensional, impermanent and constantly changing. Buddhist theory maintains that such insight results in an increased range and flexibility of perception and responsiveness to inner and outer events and experiences. This factor accounted for 5.0% of the total variance, with an internal consistency 0.76.

A similar factor structure was found for responses to the second administration of the inventory (t2). However, the factor structure proved to be somewhat unstable from t1 to t2 (see Appendix 2). The first factor for t2 describes a disidentifying mindful awareness. Factor II is composed of statements characterized by an accepting, open attitude toward experience. Factor III reflects items indicating a process-oriented understanding of experience, whereas the items comprising factor IV all have to do with the ability to pay attention to the present moment without becoming distracted or lost in one's thoughts.

## Discussion

Test results from 115 subjects over two sessions confirmed that the FMI provides a valid and internally consistent measure of mindfulness, despite a somewhat unstable factor structure from before to after a meditation retreat experience. Cronbach alphas were very high for both points of administration (0.93 – 0.94). The relatively wide dispersion of scores for the total inventory indicates that the scale can satisfactorily distinguish between different extents of mindfulness. For each measurement point, at least 22 of the 30 items on the scale could be characterized as exhibiting high values for level of item-total score correlation (> 0.5), and the

remaining items showed sufficient medium-range values (between 0.3 and 0.5) to be considered valid (Weise, 1975). Additionally, all items met stringent criteria regarding item difficulty, and face validity was assured by having a number of meditation experts suggest and select formulations for items. Our analyses, therefore, provide empirical evidence that the construct of mindfulness comprises self-report components of attentive awareness of the present moment, disidentification, diminished emotional reactivity, an open, accepting, nonjudgmental and process-oriented approach, and insightful understanding of personal experience.

The pre- and post-retreat design was based on the assumption that mindfulness scores should have been increased after a meditation retreat, the major emphasis of which was further to develop mindful awareness. The design thus served to provide an additional criterion of construct validation. Therefore, the fact that mindfulness scores greatly increased from before to after retreat additionally supports the validity of the FMI. Our results, however, did indicate that the factor structure was moderately unstable from t1 to t2. Nevertheless, despite the somewhat different factor loadings, there were substantial similarities among factors during the two points of administration. Factor II remained the most stable factor, suggesting, perhaps, the central significance of the open and accepting aspects of mindful awareness. One possible reason for the changing factor structure from pre- to post-retreat may have to do with a genuine change in the construct of mindfulness among retreatants that occurs in response to a prolonged period of sustained meditation practice. This hypothesis is also consistent with the idea that mindfulness is a developmentally acquired skill improved by regular practice and effecting an altered cognitive structure regarding the nature of experience. Indeed, it is our impression that increased differentiation of the mindfulness construct could be seen in the factor structure from pre- to post-retreat: the clusters of items at t2 that loaded on the various factors appear to represent more discrete components of mindfulness than those at t1. For example, factor II at t2 is almost exclusively composed of items representing self-acceptance, including an openness to the unpleasant and painful mental states and experiences that inevitably occur as a consequence of the impermanence of all phenomena. Factor IV at t2 deals distinctly with the very practical problem of maintaining moment-to-moment awareness in the face of continual mental distractions. Factor I also clearly relates to procedural aspects of the attentional process of mindfulness practice itself, items focussing upon paying attention to the present moment. Finally, factor III at t2 characterizes a component of basic insight into the forces that mold one's perceptions, thoughts and actions.

Factor loadings at t1 are, of course, also able to be conceptualized into different components, but they do seem, on the other hand, to represent a more diffuse clustering of statements suggestive of a more global concept of the core elements of mindfulness. Although this is obviously a *post hoc* explanation of the inconsistencies in factor loading, our argument seems plausible and worthy of future testing. Should this hypothesis prove correct, it would suggest that such changes in factor structure might be able to be used to reflect a meta-level shift in conception of the self and the nature of experience. In any case, given the developmental nature of the mindfulness method, there is no reason to assume that the factor structure of the FMI should remain highly stable over time.

It must also be noted that high secondary and tertiary factor loading were found for many items at both points of administration of the scale (18-19 of the 30 items showed such loadings between 0.31 and .53). Furthermore, examination of the unrotated factor matrix revealed that, for each point of administration, all items loaded positively on the first factor at levels beyond 0.44 for t1, and 0.57 for t2. At t1, 25 items manifested their highest loading on this factor (at t2, 27), indicating a one-dimensionality and a general factor for the construct of mindfulness.

A few problems also came to our attention in the course of this validation study. First, the current version of the FMI has relatively few items phrased in reverse due to the manner in which statements were selected, i.e. based upon expert judgement. It may, nevertheless, be preferable to reverse the phrasing of a few more items in future employment of the scale. Additionally, we chose a four-point scale in order to prevent a predominance of mid-point responses likely if we had used a five-point scale. Nevertheless, the relatively large number (over 10 %) of invalidly completed questionnaires (i.e. with either no or more than one answer) indicated to us that the steps between points were too large (particularly between the two middle points 'occasionally' and 'fairly often'). Therefore, serious consideration should be given in the future to expanding the number of choices to at least six.

It must also be acknowledged that all of the retreats were taught by teachers who were instrumental, as well, in the construction of the inventory. Therefore, the formulations provided by the teachers during the retreat lectures and interviews were sometimes likely to be somewhat similar to the statements on the FMI, and this may have possibly contributed a positive bias to the post-retreat scores. However, it must be emphasized that items of the final FMI were derived from a wide range of sources other than these teachers. Still, future research on groups with other teachers would be wise.

A last word of caution relates to the appropriateness of the instrument to different populations. We consider that the FMI can only be validly employed among individuals who have had some prior exposure to the practice of mindfulness meditation. Without such previous experience, many of the questions may be ambiguous and could be falsely construed (e.g. those items dealing with bodily awareness or with attention to unpleasant mental states). Despite these problems, we believe that the FMI has been demonstrated to be a reliable and valid instrument for assessing mindfulness. It is easy and quick to administer, and consequently can be introduced in future studies on mindful awareness without major effort. Various researchers have repeatedly criticized previous research for the lack of valid measurement of the construct of mindfulness (e.g. Scharfetter, 1983). Given the recent surge of applications of mindfulness-based programs for the treatment of a range of disorders, such an instrument would be most useful in order to test whether improvements in mental or physical health are directly tied to underlying changes in mindfulness. The FMI is a first and validated attempt to fill this need.

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## Appendix 1

### Freiburg Mindfulness Inventory (FMI)

The purpose of this inventory is to characterize your experience of mindfulness. Please use the last \_\_\_ days as the time-frame to consider each item. Provide an answer for every statement as best you can. Please answer as honestly and spontaneously as possible. There are neither 'right' nor 'wrong' answers, nor 'good' or 'bad' responses. What is important to us is your own personal experience.

Thanks very much for all your effort!

		Rarely	Occasionally	Fairly often	Almost always
1.	I am open to the experience of the present moment. (Ich bin offen für die Erfahrung des Augenblicks.)				
2.	<b>I know that I am not identical to my thoughts.</b> <b>(Ich erkenne, dass ich nicht mit meinen Gedanken identisch bin.)</b>				
3.	I sense my body, whether eating, cooking, cleaning or talking. (Ich spüre in meinen Körper hinein, sei es beim Essen, Kochen, Putzen, Reden.)				
4.	<b>When I notice an absence of mind, I gently return to the experience of the here and now.</b> <b>(Wenn ich merke, dass ich abwesend war, kehre ich sanft zur Erfahrung des Augenblicks zurück.)</b>				
5.	I am able to appreciate myself. (Ich kann mich selbst wertschätzen.)				
6.	I notice how my emotions express themselves through my body. (Ich nehme wahr, wie sich meine Gefühle im Körper ausdrücken.)				
7.	<b>I remain present with sensations and feelings even when they are unpleasant or painful.</b> <b>(Ich bleibe mit unangenehmen, schmerzhaften Empfindungen und Gefühlen in Kontakt.)</b>				
8.	I pay attention to what's behind my actions. (Ich achte auf die Motive meiner Handlungen.)				
9.	<b>I easily get lost in my thoughts and feelings.</b> <b>(Ich lasse mich von meinen Gedanken und Gefühlen leicht wegtragen.)</b>				
10.	I notice that I don't need to react to whatever pops into my mind. (Ich merke, dass ich nicht auf alles reagieren muß, was mir gerade in den Sinn kommt.)				
11.	I watch my thoughts without identifying with them. (Ich beobachte meine Gedanken, ohne mich mit ihnen zu identifizieren.)				

		Rarely	Occasionally	Fairly often	Almost always
12.	I observe how my thoughts come and go. (Ich beobachte meine Gedanken, wie sie kommen und gehen.)				
13.	I let my thoughts run away with me. (Ich verliere mich im Inhalt meiner Gedanken.)				
14.	I am aware how brief and fleeting my experience is. (Ich bin mir der Flüchtigkeit und Vergänglichkeit meiner Erfahrungen bewußt.)				
15.	<b>I consider things from different perspectives. (Ich betrachte Dinge aus mehreren Perspektiven.)</b>				
16.	I see how I create my own suffering. (Ich sehe, wie ich mir selbst Leiden schaffe.)				
17.	<b>I see my mistakes and difficulties without judging them. (Ich sehe meine Fehler und Schwierigkeiten, ohne mich zu verurteilen.)</b>				
18.	I perceive my feelings and emotions without having to react to them. (Ich nehme meine Gefühle wahr, ohne auf sie reagieren zu müssen.)				
19.	I accept myself as I am. (Ich akzeptiere mich so wie ich bin.)				
20.	I examine unpleasant, as well as pleasant, sensations and perceptions. (Ich spüre auch in unangenehme Empfindungen hinein.)				
21.	I feel connected to my experience in the here-and-now. (Ich bin in Kontakt mit meinen Erfahrungen, hier und jetzt.)				
22.	I accept unpleasant experiences. (Ich nehme unangenehme Erfahrungen an.)				
23.	I observe how experiences arise and fade away. (Ich beobachte das Kommen und Gehen von Erfahrungen.)				
24.	<b>I am friendly to myself when things go wrong. (Ich bin mir selbst gegenüber freundlich, wenn Dinge schief laufen.)</b>				
25.	I watch my feelings without getting lost in them. (Ich beobachte meine Gefühle, ohne mich in ihnen zu verlieren.)				
26.	In difficult situations, I can pause without immediately reacting. (In schwierigen Situationen kann ich innehalten.)				
27.	I avoid unpleasant feelings. (Ich wehre mich innerlich gegen unangenehme Gefühle.)				

		Rarely	Occasionally	Fairly often	Almost always
28.	I experience moments of inner peace and ease, even when things get hectic and stressful. (Ich erlebe Momente innerer Ruhe und Gelassenheit, selbst wenn äußerlich Schmerzen und Unruhe da sind.)				
29.	I am impatient with myself and with others. (Ich bin ungeduldig mit mir und meinen Mitmenschen.)				
30.	I am able to smile when I notice how I sometimes make life difficult. (Ich kann darüber lächeln, wenn ich sehe, wie ich mir manchmal das Leben schwer mache.				

Please check both sides of the pages!

Also, please make sure that you did not miss a line and you answered every statement.

Thank you very much for your cooperation!

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## Appendix 2

Four-factor principal-components solution (Varimax rotation) for the second administration, t2 (N=93)

Item No.	Statement	I	II	III	IV	h2
Factor I: Disidentifying attentional process of mindfulness						
20.	I examine unpleasant, as well as pleasant, sensations and perceptions.	.70				.58
7.	I remain present with sensations and feelings even when they are unpleasant or painful.	.67				.54
21.	I feel connected to my experience in the here-and-now.	.65				.50
23.	I observe how experiences arise and fade away.	.63				.52
4.	When I notice an absence of mind, I gently return to the experience of the here and now.	.62				.51
10.	I notice that I don't need to react to whatever pops into my mind.	.56				.39
16.	I see how I create my own suffering.	.55		(.53)		.60
18.	I perceive my feelings and emotions without having to react to them.	.52	(.41)		(.49)	.70
11.	I watch my thoughts without identifying with them.	.49		(.33)	(.40)	.56
3.	I sense my body, whether eating, cooking, cleaning or talking.	.48		(.31)		.39
2.	I know that I am not identical to my thoughts.	.46				.34
1.	I am open to the experience of the present moment.	.40	(.39)			.39
Factor II: Accepting, open attitude toward experience						
19.	I accept myself as I am.		.79			.68
5.	I appreciate myself.		.77			.67
24.	I am friendly to myself when things go wrong.	(.40)	.71			.69
22.	I can accept unpleasant experiences.	(.37)	.57	(.34)		.58
29.	I am impatient with myself and with others.	(.42)	.54			.55
17.	I see my mistakes and difficulties without judging them.		.52			.40
14.	I am aware how brief and fleeting my experience is.	(.38)	.52			.44
27.	I avoid unpleasant feelings.		.45		(.41)	.40
26.	In difficult situations, I can pause without immediately reacting.	(.36)	.42			.40
Factor III: Process-oriented understanding						
15.	I consider things from different perspectives.		(.35)	.73		.66
8.	I pay attention to what's behind my actions.			.65		.53
12.	I observe how my thoughts come and go.	(.33)		.59		.51

30.	I am able to smile when I notice how I sometimes make life difficult.	(.31)	(.41)	.48		.49
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Continuation of Appendix 2. Four-factorial principal-components analysis for t2

Item Nr.	Statement	I	II	III	IV	h2
6.	I notice how my emotions express themselves through my body.			.46	(.40)	.43
28.	I experience moments of inner peace and ease, even when things get hectic and stressful.		(.35)	.39		.41
Factor IV: Paying attention to the present moment without distraction						
13.	I let my thoughts run away with me.				.80	.70
9.	I easily get lost in my thoughts and feelings.		(.31)		.77	.73
25.	I watch my feelings without becoming lost in them.		(.31)		.66	.62
Erklärte Varianz in % (insges.: 53.0 %)		35.8	6.6	5.5	5.1	

Convergence of rotation occurred after 12 iterations. Factors I – IV are presented in columns 3-6; Communalities, h2, in column 7.