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A Metacognitive Perspective on Mindfulness: An Empirical Investigation.

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Forord

Denne hovedoppgaven ble utført ved NTNU, psykologisk institutt i perioden februar til oktober 2013.

Planleggingen av problemstillingene og undersøkelsen ble gjennomført i samarbeid med min veileder Stian Solem. Vi diskuterte oss sammen fram til hvilke skjemaer som skulle brukes, og jeg laget de elektroniske versjonene av disse i SVT-fakultets nettbaserte program for spørreundersøkelser. Et av skjemaene (GAD-7) ble oversatt av meg til norsk. Innsamlingen av data ble gjennomført av meg i februar 2013, gjennom aktiv masing på Facebook og ved å spre skjemaet så godt jeg kunne på ulike fora. Jeg fikk etter dette god hjelp til å forstå og bruke SPSS, og analysene brukt i denne oppgaven ble etter dette gjennomført av meg.

Jeg vil takke min veileder Stian Solem for all den tiden han har brukt til å gi gode forklaringer, råd, tilbakemeldinger, oppmuntring og generell empati.

Jeg vil også takke mamma, Tove Semb, for korrekturlesing og moralsk støtte.

Susanne Semb Thunes

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Abstract

The aim of this study was to explore the differences and similarities between mindfulness and metacognitions, and to investigate how these constructs relate to symptoms of psychiatric disorders. The Five Facet Mindfulness Questionnaire (FFMQ), the Metacognitions Questionnaire 30 (MCQ-30), the Patient Health Questionnaire 9 (PHQ-9), the Generalized Anxiety Disorder Assessment 7 (GAD-7), and the Obsessive-Compulsive Inventory Revised (OCI-R) were administered electronically by the use of social media and online forums, and 224 people completed all five questionnaires.

The FFMQ factors of *non-judge* and *awareness* were significantly correlated with all of the MCQ factors, while *observe, non-react* and *describe* showed weak and varying correlations. Through forward regression analyses the MCQ factors measuring negative metacognitions, *uncontrollability and danger* and *need to control thoughts,* was found to be important predictors of symptoms of psychiatric disorders. *Awareness* and *nonreact* were found to be the FFMQ factors most important in predicting symptoms of psychiatric disorders. The findings supported both the metacognitive model, and parts of the mindfulness model.

Keywords: Metacognitions, Mindfulness, Depression, Anxiety, OCD

Contents

Introduction

Anxiety disorders and depression are the two most prevalent psychiatric disorders in the world (Demyttenaere et al., 2004). Depression is the leading cause of disability, and is a major contributor to the global burden of disease (World Health Organization, 2012). While depression and anxiety are different conditions, they often occur at the same time. It is important to discover and explore psychological models that can help us understand and treat these disorders. The focus of this study is the two promising models of mindfulness and metacognitions for understanding and treating psychiatric disorders, more specifically major depressive disorder (MDD), generalized anxiety disorder (GAD) and obsessive-compulsive disorder (OCD).

The diagnostic criteria of MDD include 1) depressed mood, 2) loss of interest or pleasure, 3) weight loss, 4) insomnia or hypersomnia, 5) psychomotor agitation or retardation, 6) fatigue or loss of energy, 7) feelings of worthlessness or guilt, 8) concentration problems and 9) recurrent thoughts of death. At least five of the criteria mentioned above must be present during the same 2-week period. One of the two first criteria (depressed mood/loss of interest or pleasure) must be present.

The main diagnostic criteria of GAD include excessive anxiety and worry, occurring most days for the last six months. The person diagnosed with GAD worries about a number of events or activities, and finds it difficult to control the worry. He or she experiences three or more of the following symptoms: 1) restlessness, 2) being easily fatigued, 3) difficulty concentrating, 4) irritability, 5) muscle tension and 6) sleep disturbances.

To be diagnosed with OCD according to the DSM-IV, the person must either have obsessions or compulsions. Obsessions are defined by recurrent and persistent thought, impulses or images which are not simply worries about real-life problems. The person attempts to suppress or neutralize the thoughts, impulses or images with some other thought or action. Compulsions are repetitive behaviors, such as washing or checking which is done as a response to an obsession. These actions are done to prevent or reduce stress, or to prevent some dreaded event from happening. To be diagnosed with OCD, the obsessions and compulsions must be time consuming (at least one hour per day). The person must at some point recognize that the obsessions and compulsions are unreasonable (American Psychiatric Association, 2000).

Studies of mindfulness-based interventions such as Mindfulness Based Stress

Reduction program (MBSR) and Mindfulness Based Cognitive Therapy (MBCT) has shown promising results suggesting these interventions to be effective treatments of psychological symptoms (Baer, 2003; Fjorback, Arendt, Ørnbøl, Fink, & Walach, 2011; Ma & Teasdale, 2004).

Mindfulness

Mindfulness has been defined as "the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment". This concept of mindfulness originates from the teachings of Buddha, and is now used by many people in the western world. To practice mindfulness is to be aware of what is going on in the present moment. It is the opposite of acting on "autopilot", where the present moment is biased by routinized and habitual thoughts and feelings. While practicing mindfulness, a person will experience the present moment as the direct experience of the body and the sensory input. Meditation is used as a tool to develop the state, or the skill of mindfulness (Kabat-Zinn, 2003).

The concept of *consciousness* covers both *awareness* and *attention.* One can be aware of what is happening, but one does not necessarily focus one's attention on what is happening. Attention can be focused on something else in the environment, or for instance on one's own thoughts. Attention is to provide a heightened sensitivity to some aspect of the awareness. Through mindfulness, a person will be more attentive to, and aware of the present experience (Brown & Ryan, 2003). This entails not focusing attention on thoughts about the past and the future.

There is no unified theory of the primary mechanisms of mindfulness, but "How Does Mindfulness Help" (n.d.), an MBCT homepage article, propose that mindfulness helps against depression through several mechanisms. First, practicing mindfulness will make it easier to recognize one's own thought patterns, and thus notice mood changes earlier than before. That will make it easier to "nip it in the bud". Second, as anhedonia is a central part of depression, mindfulness makes it easier to notice the small joys of life, and can thus help a depressed person feel more alive. Third, mindfulness prevents worry and rumination, as it teaches how to focus on the present moment. It can also help by halting the escalation of these thoughts. Fourth, by being mindful, one has a non-judging attitude towards the world, which will make it easier to accept negative emotions, instead of using critical thinking strategies to solve the problem. These strategies will only lead to overthinking and rumination. Last,

mindfulness helps the person to experience emotions, instead of suppressing them.

The FFMQ (Five Facet Mindfulness Questionnaire) is a self-report questionnaire used to measure mindfulness. This instrument is based on a factor analysis of five independently developed questionnaires for measuring mindfulness. Five facets which describe the concept of mindfulness were derived. The five facets are *observing, describing, acting with awareness, nonjudging of inner experience,* and *non-reactivity to inner experience* (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006).

Observing includes attending to or noticing experiences, either internal or external. This can be a number of different experiences, like cognitions, emotions or various sensory perceptions (e.g. "I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing"). *Describing* refers to being able to put internal experiences into words (e.g. "I'm good at finding words to describe my feelings"). *Acting with awareness* is the tendency to attend to what you're doing at the moment, as opposed to "going on automatic pilot" and not paying attention to what is happening right now (e.g. "When I do things, my mind wanders off and I'm easily distracted"). *Nonjudging of inner experience* refers to being able to not evaluate thoughts and feelings as good or bad (e.g. "I criticize myself for having irrational or inappropriate emotions"). *Non-reactivity to inner experience* refers to the ability to let thoughts and emotions come and go without being caught up in or reacting to them (e.g. "I watch my feelings without getting lost in them") (Baer et al., 2008).

The facets of FFMQ and how they relate to other constructs has been explored. Baer et al. (2006) showed that *non-judge* and *awareness* were the factors most strongly correlating with psychological symptoms, neuroticism, thought suppression and difficulty regulating emotion, while *observe* and *describe* mostly showed no or weak correlations with these measures. Another study showed that *observe* and *describe* had no correlation to anxiety and depression, while the other three factors showed weak correlations (Bohlmeijer, Prenger, Taal, & Cuijpers, 2010). It has also been found that *non-judge* predicts lower levels of depression, anxiety and stress, while *awareness* predicts lower levels of depression (Cash & Whittingham, 2010). Baer et al. (2006) found *awareness, non-judge* and *non-react* to be significant predictors of psychological symptoms.

Mindfulness can be seen as a state opposite to "mindlessness", which is the same as habitual or automatic processing. Detached mindfulness is a central part within metacognitive theory, and is a concept differing from mindfulness. While detached mindfulness implicate metacognitions and conscious awareness of thoughts, mindfulness does not (Wells, 2011).

Metacognitions and Detached Mindfulness

Detached mindfulness is a concept tightly linked with metacognitions. Metacognitions can simply be put as "thoughts about thoughts", and refers to the way a person evaluates and reacts to his or her own thoughts (Jacobs & Paris, 1987). The study of metacognitions was born in the field of developmental psychology, and it was proposed that metacognitions was something that was developed throughout childhood and adolescence. It was first described as the process of evaluating one's own abilities to do a task (Flavell, 1979). The concept of metacognitions has later been examined as a fundamental basis for many psychological disorders.

Metacognitive knowledge is the beliefs and theories people have about their own thoughts, e.g. "I will go mad if I worry too much". This is an example of a negative metacognitive belief, which are the beliefs concerning the negative aspects of thinking, such as uncontrollability, importance, dangerousness of thoughts and cognitive experiences. On the other hand, positive metacognitive beliefs focus on the positive aspects of thinking. Typical examples might be "worrying helps me plan for unexpected events" or "I need to ruminate to overcome my depressed feelings".

Metacognitive strategies are strategies used to change and control thinking. This is done as a way of self-regulation, and is often used to reduce thoughts or negative emotions. Many people struggle with the feeling that their cognitions are out of control, and thus their strategies aim to control thinking. A typical example of this is the attempt of suppressing thoughts, distracting oneself, or focusing on possible future threats. Such strategies are often counter-productive. For instance, an unsuccessful attempt of suppressing a thought might reinforce the feeling of being out of control, and the focus on threats to avoid them, might just reinforce the anxiety (Wells, 2011).

The metacognitive model explains psychological disorders as maintenance of negative emotional states. These states, such as anxiety and sadness are basic internal signals experienced by everyone, but these states are prolonged with people suffering from psychological difficulties. Most people will use successful coping strategies to control cognition and reduce threat. In the metacognitive model, it is assumed that certain thinking styles and strategies, such as worry, rumination, threat monitoring, unhelpful thought control strategies, and other forms of behavior such as avoidance, maintain these negative emotional states and are the basis of all psychological disorders. These unhelpful thinking styles and strategies are called the Cognitive-Attentional Syndrome (CAS), and they are mediated by the

metacognitive knowledge, such as positive and negative metacognitions (Wells, 2002).

Detached mindfulness is described as a desirable experience, and the metacognitive perspective suggest that the state of detached mindfulness will be helpful when it comes to psychiatric disorders. If the state of detached mindfulness is reached, the person will no longer identify with the beliefs and thoughts, and will see these cognitive events as something outside the self. He or she will also be able to objectively observe his or her own thoughts, without engaging in them. A person practicing detached mindfulness will be able to see the self as an observer, observing the thoughts as events having nothing to do with the self. He or she will have a "do-nothing" strategy in reaction to thoughts and beliefs, which is the exact opposite of the CAS. In this context, "mindfulness" refers to the state of being objectively aware of one's own thoughts or beliefs. This is a metacognitive awareness of thoughts and beliefs. "Detached" refers to both the state of being disengaged from the coping responses in response of a thought or a belief, and being able to separate the conscious experience of the self from the thoughts (Wells, 2002).

The Metacognitions Questionnaire 30 (MCQ-30) was developed to measure metacognitive beliefs, judgments and monitoring tendencies (Wells & Cartwright-Hatton, 2004). Five correlated, but distinct factors which describe the construct of metacognitions has been derived. The five subscales are 1) cognitive confidence, 2) positive beliefs, 3) cognitive self-consciousness, 4) uncontrollability and danger, and 5) need to control thoughts.

The factor of *cognitive confidence* contains items related to lack of confidence or trust in one's own memory (e.g. "My memory can mislead me at times"). *Positive beliefs* refer to beliefs about worrying as a positive way of thinking. People may believe that worrying helps their planning and problem solving. Positive beliefs maintain worrying (e.g. "Worrying helps me to get things sorted out in my mind"). *Cognitive self-consciousness* is the tendency to be preoccupied with one's own thought processes (e.g. "I am constantly aware of my thinking"). *Uncontrollability and danger* is comprised of beliefs about being unable to control worrying, and the negative consequences of the uncontrollability of worrying (e.g. "My worrying is dangerous for me" and "When I start worrying I cannot stop"). *Need to control thoughts* refer to the beliefs about being able to control one's own thoughts (e.g. "Not being able to control my thoughts is a sign of weakness") (Cartwright-Hatton & Wells, 1997). A low score on the MCQ-30 should theoretically indicate a higher degree of detached mindfulness.

All of the factors of the MCQ-30 have been shown to have positive relationships with obsessive-compulsive symptoms, pathological worry, and trait-anxiety. Relationships between *uncontrollability and danger* and depression and trait-anxiety has been shown to be

particularly strong, while the four other factors had weak to moderate relationships with these measures (Spada, Nikčević, Moneta, & Wells, 2008; Wells & Cartwright-Hatton, 2004). The MCQ factors *uncontrollability and danger* and *need to control thoughts* have been shown to be strongly correlated to symptoms of OCD (Myers & Wells, 2005). Out of the five MCQ factors, *uncontrollability and danger* has been shown to predict anxiety, as measured by Hospital Anxiety and Depression Scale (HADS), while depression has been shown to be predicted by *uncontrollability/danger, cognitive confidence, need to control thoughts* and cognitive *self-consciousness,* also measured by the HADS. *Uncontrollability/danger* has been shown to be the main predictor for both constructs (Spada, Mohiyeddini, & Wells, 2008). *Need to control thoughts* and *cognitive confidence* has been shown to predict obsessive-compulsive symptoms (Gwilliam, Wells, & Cartwright-Hatton, 2004).

A metacognitive perspective on mindfulness

Adrian Wells, the originator of MCT, has discussed the similarities and differences between mindfulness and detached mindfulness. He compared detached mindfulness with a proposed operational definition of mindfulness that has two components: 1) the focus on immediate experience, controlled by attention. This component also includes the recognition of mental events in the present, and 2) to be curious, open and accepting of the present experience (Bishop et al., 2004). Wells argue that the first component of this definition is a part of detached mindfulness, but while detached mindfulness include the separation of the sense of self from inner events, this definition does not. The second part of the definition will most likely include active engagement with thoughts, a mismatch to detached mindfulness (Wells, 2011).

Mindfulness is often linked to meditation, and in this perspective, the features of mindfulness seem to conflict with with the features of detached mindfulness, which does not involve meditation, extensive and continuous practice, or increasing present-moment awareness. While mindfulness meditation often use body-anchors, such as the focus on breath, detached mindfulness does not. Detached mindfulness is specific about the sense of self as separate from mental phenomena, while mindfulness is not. Detached mindfulness is concerned about meta-awareness, rather than the focus on the present moment (Wells, 2011).

Research question and hypotheses

The metacognitive model predicts that the higher score on the metacognitions questionnaire, the higher the risk for psychiatric disorders. The mindfulness model predicts that a high score on the FFMQ means that a person is mindful, and that this will lead to lower risk for psychiatric disorders. As seen in the introduction, these models may share similar aspects, and differ in others. The concepts of metacognition and mindfulness have already been theoretically related to each other (Teasdale, 1999; Teasdale et al., 2000; Wells, 2002), but this has mainly been in a clinical context. The current study is the first to compare these two models empirically. The research questions are as follows:

1) What are the similarities and differences between mindfulness and metacognitions?

2) How do mindfulness and metacognitions relate to symptoms of major depressive disorder, generalized anxiety disorder, and obsessive-compulsive disorder?

From a metacognitive perspective, we hypothesize that *non-judge* and *awareness* will be the mindfulness factors most correlating with the metacognitive factors. Based on metacognitive theory we hypothesize that metacognitions should be most important in explaining symptoms of psychiatric disorders.

Method

Participants and Procedure

The sample were 224 Norwegian-speaking subjects between the age of 18 and 67, with a mean age of 31.8 years (SD = 13.0). The sample consisted of 75 (33.5%) men and 149 (66.5%) women. In this sample, 39.8 % were working either part time or full time, 45.1% were full time students. 1.8% were part time students, while 13.7% were receiving disability benefits or disability insurance, were retired or unemployed. In this sample, 34.4% was single, 21.4% was in a relationship, 38.8% was married or cohabiting, while 5.4% was divorced or separated.

Replies to five Norwegian versions of questionnaires measuring mindfulness, metacognitions, depression, generalized anxiety and obsessive-compulsive symptoms were anonymously collected online through posts on social media and on public online discussion forums where people were encouraged to answer and to share a link to the questionnaires.

Anyone over the age of 18 could participate, and 224 people completed all five. The three symptom questionnaires were to be answered first, followed by the mindfulness and metacognitions questionnaires. All items had to be answered. The incomplete questionnaires were not included in the analyses.

This study was approved by the Norwegian Social Science Data Services (NSD).

Measurements

Five Facet Mindfulness Questionnaire (FFMQ). Baer et al., (2006) argue that using a total score of FFMQ to measure mindfulness will provide a distorted view of the relationships between mindfulness and other concepts. If this was to be measured with the total score, the correlations would be distorted or not as strong as they could have been if they were measured by themselves. Thus, no total score of FFMQ is reported in this study. The FFMQ uses a 5-point Likert response scale (1 = never or very rarely true, 5 = very often or always true). It contains 39 items, where each facet is represented with seven or eight items each (Baer et al., 2008). The Norwegian FFMQ has been validated for use in Norway (Dundas, Vøllestad, Binder, & Sivertsen, 2013). In the current study, FFMQ showed adequate psychometric characteristics with Cronbach's alpha on the five facets of 0.80, 0.88, 0.86, 0.92 and 0.80, respectively.

Metacognitions Questionnaire 30 (MCQ-30). The MCQ is divided into five subscales, and a total score is also provided. The MCQ-30 uses a 4-point Likert response scale (1 = do not agree, 2 = agree slightly, 3 = agree moderately, 4 = agree very much) and contains 30 items (Cartwright-Hatton & Wells, 1997). The MCQ-30 has earlier been shown to have strong positive correlations with the Penn State Worry Questionnaire (PSWQ) (Wells & Cartwright-Hatton, 2004), both the anxiety and the depression scale of the Hopkins Symptom Checklist 25 (HSCL-25) (Hjemdal, Stiles, & Wells, 2013), and OCD (Solem, Håland, Vogel, Hansen, & Wells, 2009). In the current study, MCQ-30 showed adequate psychometric characteristics with Cronbach's alpha on the five factors of 0.80, 0.85, 0.80, 0.88 and 0.85, respectively.

Patient Health Questionnaire 9-item (PHQ-9). The PHQ-9 is based on the Patient Health Questionnaire (PHQ), which is a diagnostic tool used in primary care. The PHQ contains criteria for depressive and other common mental disorders (Spitzer, Kroenke, & Williams, 1999). The name PHQ-9 refers to the nine items in the questionnaire, and is based

on the nine criteria for diagnosing depression in DSM-IV. Each item is reported on a four-point Likert scale (0 = not at all, 1 = some days, 2 = more than half the days, 3 = almost every day), and the answers refer to the past two weeks. The PHQ-9 total score is used as a severity measure, and can range from 0 to 27. The PHQ-9 has been shown to have good internal reliability and test-retest reliability, as well as criterion validity, construct validity and external validity. (Kroenke, Spitzer, & Williams, 2001). In the current study, the PHQ-9 showed adequate psychometric characteristics with a Cronbach's alpha of 0.88.

Generalized Anxiety Disorder 7-item (GAD-7). GAD-7 is based on the DSM-criteria for generalized anxiety disorder. Each item is reported on a four-point Likert scale (0 = not at all, 1 = some days, 2 = more than half the days, 3 = almost every day), and the answers refer to the past two weeks. The total score ranges between 0 – 21, and the questionnaire is a severity measure. The GAD-7 has been shown to have good reliability, as well as good criterion, construct, factorial and procedural validity (Spitzer, Kroenke, Williams, & Löwe, 2006). In the current study, the questionnaire showed adequate psychometric characteristics with a Cronbach's alpha of 0.89.

Obsessive-Compulsive Inventory Revised (OCI-R). The OCI-R is an 18-item self-report questionnaire (Foa et al., 2002). OCI-R was developed to examine the presence and severity of obsessive-compulsive symptoms. Each item is rated on a 5-point Likert scale (0 = not at all, 4 = extremely). The total score of the OCI-R provides information about the OCD severity, but there are also sub-scores which addresses the severity of the different types of obsessions and compulsions. There are six subscales included in the OCI-R: Washing, checking, obsessions, neutralizing, ordering and hoarding. The score of OCI-R ranges between 0 – 72. The OCI-R has earlier been shown to be a valid and reliable diagnostic tool (Foa et al., 2002). The Norwegian version has been validated (Solem, Hjemdal, Vogel, & Stiles, 2010). In the current study, the OCI-R showed adequate psychometric characteristics with a Cronbach's alpha of 0.90 for the total score.

Data analyses

Correlation coefficients were applied to investigate the relationships between the single factors in the MCQ and the FFMQ, and the symptom scores in PHQ-9, GAD-7 and OCI-R. Three forward multiple regressions were conducted to determine the relative importance of the factors of FFMQ and MCQ in predicting obsessive-compulsive symptoms and symptoms

of depression and anxiety. Stage one of the analyses were used to control for age and gender. The five factors of the MCQ (metacognitions) and the five factors of FFMQ were entered at stage two.

Results

Levels of depression, anxiety and obsessive-compulsive symptoms in the sample

The mean score of PHQ-9 was 6.56 (SD = 5.61). The optimal cut-off score when using PHQ-9 is recommended to be between 8 − 11, and is often at 10 (Manea, Gilbody, & McMillan, 2012). In this study, we chose a cut-off point of 10 and above, and 20.5% scored above this cut-off, and could likely be diagnosed with MDD. Of the people checking off any problems, 10.2% reported that their problems with depression made doing their work, taking care of things at home, or getting along with other people as being "very difficult", while 2.3% reported this as being "extremely difficult".

In this sample, the mean score of GAD-7 was 5.32 (SD = 4.61). The recommended cut-off point is a score of 10. In this sample, 14.8% scored above cut-off and could likely be diagnosed with GAD/panic disorder/social anxiety disorder/PTSD. Of the people checking off any problems, 11.1% reported that their anxiety problems made doing their work, taking care of things at home, or getting along with other people as being "very difficult", while 2.8% reported this as being "extremely difficult".

In this sample, the mean OCI-R score was 10.06 (SD = 9.78). The recommended cut-off point is 21, with scores at or above this level indicating the likely presence of OCD. (Foa et al., 2002). In this sample, 11.6% scored above this point. A summary of these scores are given in Table 1.

Table 1. *Levels of mindfulness, metacognitions and symptoms*

	Range	Mean	SD
MCQ			
Positive beliefs about worry	6 - 24	9.16	3.28
Uncontrollability and danger	6 - 24	11.04	4.66
Cognitive confidence	6 - 24	10.82	4.21
Need to control thoughts	6 - 24	9.50	3.88
Cognitive self-consciousness	6 - 24	12.59	3.87
Total	30 - 120	53.11	14.83
FFMQ			
Observe	8 - 40	24.25	6.07
Describe	8 - 40	25.07	5.83
Awareness	8 - 40	23.66	5.15
Non-judge	8 - 40	29.33	7.57
Non-react	7 - 35	19.93	5.12
PHQ-9	0 - 27	6.56	5.61
GAD-7	0 - 21	5.32	4.61
OCI-R	0 - 72	10.06	9.78

Relationships between the symptoms, metacognitions and mindfulness

All of the five factors in MCQ correlated positively and significantly with the symptom measures. The two factors correlating the most with the three symptom measures were *uncontrollability and danger* and *need to control thoughts.*

Four of the factors in FFMQ correlated negatively and significantly with symptoms of psychological disorders. The two facets with the strongest correlations were *awareness* and *non-judge*. *Observe* did not correlate with any symptoms.

When comparing mindfulness and metacognitions, we found that *awareness* and *non-judge* were the two facets of FFMQ most correlating with MCQ. The strongest correlations found were the ones between *uncontrollability and danger* and *non-judge* and between *need to control thoughts* and *non-judge*. *Observe* and *non-react* had the weakest correlations with the MCQ, and most correlation coefficients were not significant. A summary of the correlation analyses is given in Table 2.

Table 2. Correlations between metacognitive factors, mindfulness factors and symptom measures.

	GAD-7	PHQ-9	OCI-R	MCQ-30					
				Positive beliefs about worry	Beliefs about uncontrollability and danger	Cognitive confidence	Need to control thoughts	Cognitive self-consciousness	Total MCQ-30
GAD-7				.31**	.71**	.38**	.58**	.47**	.68**
PHQ-9	.73**			.23**	.62**	.45**	.59**	.34**	.62**
OCI-R	.61**	.60**		.28**	.62**	.43**	.63**	.36**	.64**
FFMQ									
Observe	.10	.04	.04	.15*	.07	.07	.08	.38**	.20**
Describe	-.18**	-.28**	-.24**	-.04	-.27**	-.29**	-.27**	.09	-.23**
Awareness	-.49**	-.58**	-.45**	-.22**	-.44**	-.44**	-.43**	-.27**	-.49**
Non-judge	-.65**	-.55**	-.46**	-.37**	-.67**	-.30**	-.63**	-.52**	-.69**
Non-react	-.36**	-.34**	-.24**	.05	-.35**	-.12	-.22**	.09	-.17*

Note. *p < 0.05, **p < 0.01

Depressive symptoms. With PHQ-9 (depression) as the dependent variable, the forward regression analysis revealed that at stage one, age and gender explained 2.4% of the variance, but did not significantly contribute to the regression model. Four out of the ten metacognitive and mindfulness factors were significant. *MCQ Beliefs about uncontrollability and danger* explained 37.1% of the model. *FFMQ Awareness* explained an additional 11.2%. *MCQ Need to control thoughts* explained another 2.4%. In addition, *FFMQ Non-react* also explained 2.2%. Together, these variables accounted for 55.3% of the variance in PHQ-9. A summary of the regression analysis is given in Table 3.

Table 3. *PHQ-9 as Dependent Variable*

	F cha	R^2 cha	Sig. F cha	β	t
Step 1	2.69	.024	.070		
Gender				.04	.55
Age				-.15	-2.26*
Step 2	135.02**	.371	.000		
Gender				.00	.08
Age				-.08	-1.5
MCQ Uncontrollability and danger				.61	11.62**
Step 3	49.78**	.112	.000		
Gender				-.01	-.16
Age				-.04	-.81
MCQ Uncontrollability and danger				.46	8.64**
FFMQ Awareness				-.38	-7.06**
Step 4	11.23**	.024	.001		
Gender				.02	.43
Age				-.02	-.44
MCQ Uncontrollability and danger				.32	4.88**
FFMQ Awareness				-.34	-6.42**
MCQ Need to control thoughts				.22	3.35**
Step 5	10.65**	.022	.001		
Gender				.03	.58
Age				-.02	-.42
MCQ Uncontrollability and danger				.26	3.88**
FFMQ Awareness				-.34	-6.6**
MCQ Need to control thoughts				.23	3.52**
FFMQ Non-react				-.16	-3.26**

* $p < 0.05$, ** $p < 0.01$

Anxiety. The regression analysis with GAD-7 (anxiety) as the dependent variable showed that at stage one, age and gender did significantly contribute to the regression model by explaining 3.2%. At stage two, five of the metacognitive and mindfulness factors significantly contributed to the model, *MCQ Beliefs about uncontrollability and danger* explained 48.3% of the model. *FFMQ Non-judge* explained an additional 5.2%. *FFMQ Non-react* explained 1.5%. *FFMQ Awareness* explained another 1.4%, and in addition *FFMQ Describe* explained 1.1%. Together, these variables accounted for 60.7% of the variance in GAD-7. A summary of the regression analysis is given in Table 4.

Table 4. *GAD-7 as dependent variable.*

	F cha	R^2 cha	Sig. F cha	β	t
Step 1	3.61*	.032	.029		
Gender				.05	.67
Age				-.17	-2.62**
Step 2	218.18**	.483	.000		
Gender				.01	.24
Age				-.10	-2.14*
MCQ Uncontrollability and danger				.70	14.77**
Step 3	26.33**	.052	.000		
Gender				-.00	-.08
Age				-.08	-1.87
MCQ Uncontrollability and danger				.50	8.28**
FFMQ Non-judge				-.31	-5.13**
Step 4	7.98**	.015	.005		
Gender				-.00	-.04
Age				-.08	-1.77
MCQ Uncontrollability and danger				.44	6.99**
FFMQ Non-judge				-.32	-5.45**
FFMQ Non-react				-.13	-2.82**
Step 5	7.36**	.014	.007		
Gender				-.00	-.04
Age				-.07	-1.57
MCQ Uncontrollability and danger				.42	6.81**
FFMQ Non-judge				-.26	-4.12**
FFMQ Non-react				-.13	-2.77**
FFMQ Awareness				-.14	-2.71**
Step 6	6.02*	.011	.015		
Gender				-.03	-.65
Age				-.08	-1.88
MCQ Uncontrollability and danger				.44	7.08**
FFMQ Non-judge				-.26	-4.21**
FFMQ Non-react				-.16	-3.36**
FFMQ Awareness				-.16	-3.06**
FFMQ Describe				.12	2.45*

* p < 0.05, ** p < 0.01

Obsessive-compulsive symptoms. Age and gender explained 1.3% of the regression model, but did not significantly contribute. *MCQ Need to control thoughts* explained 38.7% of the model. The next contributing variable in the model was *MCQ Beliefs about uncontrollability and danger* which explained an additional 6.4%. *MCQ Cognitive confidence* explained another 2.1%, and *FFMQ Awareness* contributed 1.1% to the model. Together, these variables accounted for 49.5% of the variance in OCI-R. A summary of the regression analysis is given in Table 5.

Table 5. *OCI-R as dependent variable.*

	F cha	R^2 cha	Sig. F cha	β	*t*
Step 1	1.45	.013	.237		
Gender				-.03	-.414
Age				-.11	-1.65
Step 2	141.67**	.387	.000		
Gender				.03	.50
Age				.00	.02
MCQ Need to control thoughts				.63	11.90**
Step 3	25.96**	.064	.000		
Gender				-.01	-.26
Age				-.00	-.04
MCQ Need to control thoughts				.39	5.64**
MCQ Uncontrollability and danger				.35	5.10**
Step 4	8.69**	.021	.004		
Gender				.02	-.30
Age				.01	.12
MCQ Need to control thoughts				.37	5.46**
MCQ Uncontrollability and danger				.29	4.11**
MCQ Cognitive confidence				.16	2.95**
Step 5	4.83*	.011	.029		
Gender				-.02	-.45
Age				.02	.31
MCQ Need to control thoughts				.35	5.03**
MCQ Uncontrollability and danger				.27	3.85**
MCQ Cognitive confidence				.13	2.21*
FFMQ Awareness				-.13	-2.20*

* p < 0.05, ** p < 0.01

<center>**Discussion**</center>

This study set out to explore the similarities and differences between mindfulness and metacognitions, and to find out how these two relate to major depressive disorder, generalized anxiety disorder, and obsessive-compulsive disorder.

Similarities and differences between mindfulness and metacognitions

Our main finding when it comes to similarities and differences between mindfulness and metacognitions was that the factors *awareness* and *non-judge*, which are central components to mindfulness, were the factors most strongly related to metacognitions. This confirmed our first hypothesis. We also found that the factor of *observe* was not related to metacognitions, and that *non-react* had a negligible relationship with metacognitions. *Describe* showed weak correlations with four of the factors in MCQ, and no relationship to the factor of *cognitive self-consciousness.*

Non-judge was the factor correlating the most with MCQ factors, especially with *uncontrollability/danger* and *need to control thoughts.* From a metacognitive perspective, *non-judge* measures rumination, self-punishment, uncontrollability/danger, and positive and negative beliefs about worry, all constructs closely related to metacognitions, which could explain the strong correlation. The results indicated that people with a low score on negative metacognitive beliefs practice a non-judging attitude towards their thoughts.

FFMQ Awareness correlated moderately with metacognitions. From a metacognitive perspective some of the items in *awareness* can be interpreted as tapping metacognitive constructs such as worry and distractibility, which could be related to detached mindfulness.

The only MCQ factor that correlated with *FFMQ Observe* was *cognitive self-consciousness.* The metacognitive factors all focus only on cognitions, while *observe* focuses on the noticing of one's own sensory experiences of external events. *Cognitive self-consciousness* and *observe* are both about noticing internal events, and this might be the reason why they were related. From a metacognitive perspective, *observe* is not considered important or helpful in relation to psychological disorders.

FFMQ non-react showed a moderate correlation with *uncontrollability and danger,* but weak or no relationship with the other MCQ factors. From a metacognitive perspective, *non-react* measures different constructs. Some of the items are similar to detached mindfulness, while others measure executive control, reactivity and metacognitive awareness.

All of the correlations with MCQ factors were either non-existing or weak regarding *FFMQ Describe.* This factor concerns the ability to put feelings and thoughts into words. None of the items in MCQ explores this ability, as the ability to describe feelings and thoughts are not considered important in metacognitive theory.

Relationships between mindfulness, metacognitions and symptoms

Both metacognitions and mindfulness correlated with symptoms of psychiatric disorders. Of the FFMQ factors, *awareness* and *non-judge* were the factors with the strongest correlations to the psychiatric disorders. These results were consistent with Baer et al. (2006) and Cash and Whittingham (2010) who also found these two factors to be the ones correlating the most with psychological symptoms.

Of the MCQ factors, the factors measuring negative metacognitions (*uncontrollability/danger* and *need to control* thoughts) were the ones with the strongest relationships with psychiatric symptoms. These four FFMQ and MCQ factors also correlated strongly with each other.

Uncontrollability/danger was important to all of the psychiatric disorders measured, while *need to control thoughts* was important to depressive and obsessive-compulsive symptoms, but not to symptoms of anxiety. This is in line with Spada et al.'s (2008) regression model of anxiety and depression. *Need to control thoughts* was the strongest predictor of obsessive-compulsive symptoms, which is in line with previous findings from Gwilliam et al. (2004). It also explained significant variance in depressive symptoms.

Of the FFMQ factors, *awareness* was the strongest predictor for both anxiety and depression, and was also a significant predictor of obsessive-compulsive symptoms. *Non-react* was also a predictive factor in both depression and anxiety. These findings are in line with Baer et al. (2006) who found *awareness, non-judge* and *non-react* to be predictive factors in psychological symptoms.

As mentioned earlier, *awareness,* from a metacognitive perspective, might be seen as measuring symptoms of worry and distractibility, which are constructs related to metacognitions and detached mindfulness. *Non-react* also includes several traits, and some items are similar to detached mindfulness. This might be why these factors are important in the regression models from a metacognitive perspective.

Non-judge was omitted in the analyses of depression and obsessive-compulsive disorder, but was included in the analysis for GAD. *Need to control thoughts* and *non-judge*

did not turn out as significant simultaneously in any of the three models. It might seem that *non-judge* and *need to control thoughts* cancel each other out in the regression analyses. The likelihood of that is supported by strong correlations observed between these two constructs.

Strengths and limitations

This study used questionnaires with good psychometric qualities, as well as having a decent sample size with variation in the levels of symptoms. To our knowledge, this was the first empirical study exploring the relationship between mindfulness and metacognitions.

The first limitation to this study is that it was a cross-sectional study, which means that inferences about causality cannot be made. The data used in this study was self-reported, which means that it may have been biased by selective memory, exaggeration and social desirability. The sample used in this study was a convenience sample, and therefore the conclusions of this study cannot be generalized to the population. There were no control group, nor clinical group, thus it is difficult to draw inferences for specific groups from our findings.

This sample had a higher than normal occurrence of people with symptoms of psychiatric disorders, as well as a high occurrence of people receiving disability benefits. The prevalence of anxiety and depression was higher in our study than in a study of the Swedish general population. In our sample, 14.8% scored above cut-off of 10 on GAD-7, compared to 14.7% with a cut-off of 8 in the Swedish sample. Both studies used a cut-off of 10 with PHQ-9. While 20.5% scored above cut-off in our study, 10.8% did so in the Swedish study (Johansson, Carlbring, Heedman, Paxling, & Andersson, 2013). The mean scores of OCI-R matched a student sample from a Norwegian study ($d = -.04$) (Solem et al., 2010). The mean scores of the MCQ-30 matched a community control sample in a Norwegian study ($d = .03$) (Solem et al., 2009), while the mean score of the FFMQ was slightly lower than in another Norwegian study ($d = -.36$) (standard deviations were not reported in the latter study, thus Cohen's d is calculated with the assumption that their SD is the same as ours) (Dundas et al., 2013). The high occurrence of people receiving disability benefits might be explained by the method of posting the study in online forums, such as forums for general discussion in news sites.

Because of the use of electronic questionnaires, only computer literate people were able to participate. Less than half of the people who started filling out the questionnaire, completed it. This might indicate that the questionnaires were either too long or too difficult for many people to complete them. This might lead to a bias in the sample, where people in

need of some assistance did not complete the questionnaires. The five questionnaires were not given in random order because of the software program used, which means that the results might be affected due to order effects.

Future research could explore the differences between patient- and control groups when it comes to metacognitions and mindfulness. Detached Mindfulness Questionnaire (DMQ) is a new questionnaire measuring detached mindfulness, and is recommended for use in future research. With a bigger sample, a factor analysis could be conducted for further investigation of the similarities and differences between mindfulness and metacognitions, and their relationships with symptoms of psychiatric disorders.

Conclusion

To our knowledge, this has been the first study to empirically compare mindfulness with metacognitions. The mindfulness factors *non-judge* and *awareness* showed a strong relationship to metacognitions. O*bserve, describe* and *non-react* were shown to have varying relationships with metacognitions. Negative metacognitions, as measured by *need to control thoughts* and *uncontrollability and danger* was shown to be important factors for predicting symptoms of psychiatric disorders. The mindfulness factors of *awareness* and *non-react* were also important in explaining symptoms. *Cognitive confidence, non-judge* and *describe* were important for one psychiatric disorder each, but has not been shown to be important for all three psychiatric disorders. These findings supported both metacognitive theory and parts of the concept of mindfulness.

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