Validation of the mindful coping scale

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The aim of this research is to develop and validate a self-report measure of mindfulness and coping, the mindful coping scale (MCS). Dimensions of mindful coping were theoretically deduced from mindfulness theory and coping theory. The MCS was empirically evaluated by use of factor analyses, reliability testing and nomological network validation. The study's participants were high school students from two high schools, covering all streams. Further validation was obtained by correlating the MCS-subscales with an appraisal theory-based measure of coping strategies. Results from factor analyses supported the proposed measurement model and Cronbach's alphas indicated good internal consistency for the four sub-scales. Furthermore, correlations with instrument for measuring coping were mainly in accordance with our expectations. The above supports the validation of our instrument.

Keywords: mindfulness; coping; self-report; assessment

Introduction

Findings from a new report, *Helsetilstanden i Norge – Folkehelserapport 2010*: 2 (*The state of public health in Norway – Public health report 2010*: 2), state that chronic diseases have become the major challenge for public health in Norway today. Amongst such diseases are mental health problems, which, according to the World Health Organization, are the foundation for well-being and effective functioning for an individual as well as for a community. This reveals the importance of promoting mental health issues.

Mindfulness originates from Eastern meditation practices but has, in Western medical and psychological literature, emerged as an effective treatment for both psychological and somatic symptoms (Crane et al. 2008; Brown, Ryan, and Creswell 2007; Grossmann et al. 2004; Baer 2003), with the aim of increasing one's well-being. A widely accepted definition of mindfulness is that '[it is] paying attention in a particular way: on purpose, in the present moment, and non-judgementally. . .[nurturing] greater awareness, clarity, and acceptance of present-moment reality' (Kabat-Zinn 1994, 4), and hence is an inner discipline for learning to meet and enter with awareness the challenges inherent in taking care of ourselves and others (Santorelli 1999). Studies suggest that mechanisms of mind-fulness involve both relaxation and important shifts in cognition, emotion, biology and behaviour that work to improve health (Greeson 2008). Mindfulness was initially introduced to secular therapeutic settings through Kabat-Zinn's (1982, 1990) programme of mindfulness-based stress reduction and Linehan's (1993a, 1993b) dialectical behaviour therapy (Shapiro 2009), followed by other western scientists such as Segal, Williams and Teasdale's (2002) programme of mindfulness-based cognitive therapy for depression, and Hayes, Strosahl and

Wilson's (1999) acceptance and commitment therapy. In later years, mindfulness has also been introduced to other areas and to various populations with the aim of promoting mental health, such as to youths with psychological symptoms (Singh et al. 2007; Zylowksa 2008; Biegel et al. 2009) and other groups with mental health problems (Kristeller and Hallett 1999; Singh et al. 2006; Hanstede, Gidron, and Nyklicek 2008).

Regarding work on mindfulness-based interventions for children, this is still in its infancy; however, the methods of acceptance and mindfulness may prevent problems in children if applied to pain, anxiety, or depression (Hayes and Greco 2008). Mindfulness-based interventions for children may also more specifically h ave p ractical applications to assisting children with severe emotional behavioural disorder (SEBD) to regulate their emotions and improve their patterns of thought, by letting the children in a non-judgemental manner experience thoughts as only thoughts, and feelings as just feelings. Mindfulness could additionally be used by staff working with children with severe emotional behavioural disorder, as it teaches them to regulate their own emotions, decrease stress levels and experience ongoing situations in a non-judgemental manner.

Mindfulness may allow us to react more creatively to the present moment, in preference to acting on reactions that start the cycle of rumination (Williams et al. 2007), and mindfulness-based interventions are more specifically suited to enabling those with a recurrent or chronic condition to work differently with their specific vulnerability in addition to gaining skills with the aim of enable effective ongoing management of their condition (Crane et al. 2010). Hence finding ways to measure and monitor mindfulness is highly relevant in general as well as relevant to the SEBD field specifically, and therefore an important area for study.

The concept of mindfulness refers to a process of bringing a certain quality of attention to moment-by-moment experience (Kabat-Zinn 1990). This capacity, among others, is developed using various meditation techniques that originate from spiritual practices as taught in Buddha's time (Hanh 1975). Mindfulness practices can be divided into three main parts; that is, meditation, body scan and yoga (Kroese 2005). Within mindfulness meditation, which is the main method, focus is awareness of one's breath. The method differs from autogenic techniques in that one takes a stance as an observer of the breath in preference to controlling it. This is a relaxation technique in itself, as well as a technique that may help the individual to become capable of interrupting and/or diverting the attention from negative automatic thoughts or ruminating thoughts that otherwise may decrease one's well-being. Mindfulness teaching and practices involves three main elements (Crane et al. 2008): the development of awareness through both formal and informal practices; a framework that is characterised by kindness, curiosity and willingness to be in the present moment; and an embodied understanding of the vulnerable self.

In recent years, scale measurements have been developed with the aim of measuring mindfulness. These include the Freiburg mindfulness inventory (FMI) (Bucheld, Grossman, and Walach 2001), the mindful attention awareness scale (MAAS) (Brown and Ryan 2003), the Kentucky inventory of mindfulness skills (KIMS) (Baer, Smith, and Allen 2004), the cognitive and affective mindfulness scale (CAMS) (Feldman et al. 2004), the cognitive and affective mindfulness scale-revised (CAMS-R) (Feldman et al. 2007), the Southampton mindfulness questionnaire (SMQ) (Chadwick et al. 2008), the Toronto mind-fulness scale (TMS) (Lau et al. 2006) and the Philadelphia mindfulness scale (PHLMS)(Cardaciotto et al. 2008).

The majority of these measure a general level of mindfulness and treat mindfulness as more trait-like (such as the FMI, the MAAS and the CAMS). Some are designed for and/or developed with participants practising meditation (such as the FMI and the TMS), some consider mindfulness a uni-dimensional construct (such as the FMI, the MAAS and the SMQ) while others regard mindfulness as a bi- or multifaceted construct (such as the KIMS, the CAMS, the TMS and the PHLMS). Only one scale aims to assess the attainment of the mindfulness state (the TMS). None of the mentioned scales approach mindfulness as a way of coping or as a part of the coping process explicitly; that is, linking the general level of mindfulness explicitly to other well-known coping skills. For instance, the SMQ (Chadwick et al. 2008) was developed with the aim of measuring degree of mindfulness when experiencing distressing thoughts and images. It does not, however, present other adequate coping options than that of being mindful regarding the distress; that is, other coping options that may become available to the individual through being mindful. Thus, as mindfulness makes the individual capable of being in the present moment as it is, in preference to reacting habitually to it (Brown, Ryan, and Creswell 2007), it can be viewed as an effective means to cope with various challenges. In latter years, mindfulness has become increasingly emphasised within therapeutic contexts (Kabat-Zinn 1990; Linehan 1993a, 1993b; Hayes, Strosahl, and Wilson 1999; Segal, Williams, and Teasdale 2002). One of these interventions, dialectical behavioural therapy (DBT), integrates mindfulness with coping skills from behavioural therapy (Linehan 1993a, 1993b). We thus argue that mindfulness could be viewed as a part of a coping process and that there is a need for measurements of coping by mindfulness. The aim of this article is, therefore, to document the development of a mindful coping scale based upon the theoretical approach of DBT.

A conceptual framework of mindful coping

Most definitions of mindfulness highlight two key constructs: behaviour that is conducted and how the behaviour is conducted (Cardaciotto et al. 2008). More specifically, common to the definitions of mindfulness are these four components: the ability to regulate attention, an orientation to present experience, awareness of the experience, and attitude of acceptance (non-judgement) towards the experience (Feldman et al. 2007). Despite discrepancies in its content, the two-component definition by Bishop et al. (2004) of mind-fulness has been acknowledged as an important contribution. The first component focuses on the self-regulation of attention so that it is maintained on immediate experience. This involves sustained attention, skills in switching back to the experience if the mind wanders, and non-elaborative awareness of thoughts, feelings and sensations. Furthermore, all mindfulness-based approaches have in common that they can lead the individual to re-evaluate and hence facilitate a shift in the goals of self-regulation, which again can result in the abandonment of problematic goals in favour of more functional and/or realistic goals (Crane et al. 2008). The second component involves approaching one's experience with an orientation of curiosity and acceptance, regardless of the valence and desirability of the experience. In all, mindfulness meditation provides a context of de-centred perspective from which a person may experience a broader range of events that again may help regulate and inform behaviour in ways that was earlier unavailable (Williams 2008).

Dialectical behaviour therapy (DBT) is a variant of cognitive behavioural therapy that adopts mindfulness-based coping skills (Linehan 1993a, 1993b). In short, 'dialectical' refers to the specific world view upon which DBT is based, comprising main characteristics such as interrelatedness and wholeness (i.e., a holistic system perspective of reality implying that analyses of parts have limited value unless related to a whole), polarity (i.e.,

reality is complex and processual as it is comprised of internal opposing forces that, when integrated, bring forward a new set of opposing forces), and continuous change (i.e., tension between the polarities within each system produces change) (Linehan 1993a).[1] Skills within DBT that are taught to cope with different forms of tension are control of attention, interpersonal effectiveness skills (i.e., effectiveness in interpersonal conflicts) and emotion modulation skills (i.e., regulation of emotions), as well as distress tolerance skills (i.e., toleration of emotional distress) (Linehan 1993a, 1993b). DBT emphasises mindfulness as psychological and behavioural versions of meditation skills taught in Eastern spiritual training practised by the quality of awareness one brings to activities in the current moment, and at the same time emphasise mindfulness as core skills for the intervention in its entirety (Linehan 1993a, 1993b). Hence, the DBT-approach to mindfulness and coping constitutes the foundation upon which mindful coping is operationalised in the following development and validation of the mindful coping scale (MCS).

The MCS consists of four aspects. Firstly, as mindfulness is a quality of our awareness that provides an adequate point of departure for meeting with challenges through acceptance, 'awareness' is a central aspect of the MCS. Implicit in mindful awareness are qualities such as observing and describing the present in a non-judgemental manner, emphasising acceptance of what is. This may reveal new coping options otherwise unconsidered. In the MCS, mindfulness qualities are tentatively revealed through a focus on awareness-training, e.g., observing, describing and well-known qualities of the mindful state, e.g., non-judgement, acceptance, as these qualities decrease disturbed cognition (Lieb et al. 2004).

Secondly, another sector of mental ill-health, impulsivity, can be reduced by learning distress tolerance such as distraction. When done mindfully and over a short time period, distraction can provide a necessary break from a stressor so that one can tolerate emotional distress when change is slow or unlikely (Lieb et al. 2004). Such distraction is thought to increase the individual's ability to bear pain skilfully (Linehan 1993a), e.g., distracting one self from the present to avoid impulsive and potential destructive thoughts and/or actions. Distracting oneself from a current situation experienced as a crisis is a first step towards acceptance and awareness as it improves our ability to tolerate distress in preference to act impulsively on it. Furthermore, distraction may be useful when affect is overwhelming and there is no immediate task at hand (Beck 1995), and those who engage in activities allowing for distraction from rumination and sad feelings are more likely to experience more short-lived depressive moods (Segal, Williams and Teasdale 2002). That distraction may be a superior preliminary strategy has also been stated elsewhere (Nolen-Hoeksema, Morrow, and Fredrickson 1993) although studies have indicated that these should be active and engaging in preference to passive and non-engaging (Abela, Brozina, and Haigh 2002). Hence the MCS view the second aspect, 'distraction' through mindful distractions, either mentally or physically, as representing a prolonging of the preceding mindful approach making distraction an adequate coping strategy. Thirdly, in DBT mindfulness is also emphasised as important regarding emotion regulation (Linehan 1993a). The latter may decrease the occurrence of affective disturbance, as all people are susceptible to emotional reactivity when under stress (Linehan 1993a). DBT emphasises several categories of emotion regulation; however, as several of them are either very similar to mindfulness qualities or context-specific, mainly those focusing on building coping resources by reducing vulnerability to emotional reactivity are included here. Hence 'preventing negative emotions' is a third aspect of the MCS, containing qualities that may increase positive feelings as well as activities limiting vulnerability to negative emotions. Examples are activities to increase positive feelings in daily life as a means to enhance the

experience of positive feelings in addition to effective physical coping such as engaging in a physical activity. Finally, relational aspects of mindfulness have been emphasised in different manners (e.g., Kramer 2007). Within DBT, mindfulness is emphasised regarding communication (Linehan 1993a), and coping skills are related to increasing stable relationship and avoiding unstable ones as well as to effective ways of achieving one's objectives while simultaneously maintaining relationships and self-esteem.

Following this, the MCS identify methods for establishing and/or maintaining stable relations through efficient verbal communication, and 'constructive self-assertion' is therefore the fourth aspect of the MCS. It contains qualities of preparation and being aware of either an upcoming or an ongoing interpersonal situation where it is necessary to stay focused on one's objectives while attending to one's self-esteem and the quality of the relationship at hand. When done mindfully, such conversation is effective both prior to as preparation and when in situations where it is necessary.

Following from the above, we argue that the four aspects – awareness, distraction, preventing negative emotions and constructive self-assertion – are important to increase our understanding of the coping process embedded in the mindful coping concept. By relating the concepts of mindfulness and coping further through theories of appraisal in the following discussion, the actual coping facet of mindfulness is tentatively shown theoretically. As the MCS is based upon theories from which DBT has been developed as well as the intervention's implications, the following approach towards the mindful coping concept seems appropriate.

Nomological network validation: implementing a conceptualisation of coping based on appraisal theory

A main objective regarding construct validity is to investigate the relationship between the theoretical and empirical realm. One means to prove that a measure has construct validity is by developing a nomological network (Cronbach and Meehl 1955). A nomological network consists of interlocking 'laws' that constitute a theory, and includes both theoretical and empirical frameworks as well as showing how these frameworks are linked (Cronbach and Meehl 1955). As such, construct validation cannot be claimed unless the network makes contact with observations (Cronbach and Meehl 1955). In short, validation by nomological network may be performed by estimating correlations of a measure of interest with other already validated measures expected to contain either synonymous or antonymous constructs. Positive correlations with the synonymous constructs, and negative correlations with the antonymous constructs, indicate a valid measurement model. As part of the validation of the proposed measure of mindful coping, associations with an established measurement of coping strategies based on appraisal theory will be conducted.

Coping strategies can be divided into three main categories: problem-focused, emotion-focused and avoidance coping (Lazarus and Folkman 1984). Both problem-focused and emotion-focused strategies are adequate efforts to manage demands appraised as taxing one's resources. While the first type involves direct efforts to modify the problem at hand, the latter type involves regulating emotion surrounding the stressful event (Lazarus and Folkman 1984). Hence, problem-focused coping is an active strategy, while emotion-focused is passive. The avoidant coping strategy is specifically used in relation to problems experienced as either inaccessible to change or of importance (Folkman et al. 1986). We argue that mindfulness can aid coping not only by allowing more adaptive responses but also by making several adequate coping responses available to the individual. This has also been argued elsewhere (Crane et al. 2008; Shapiro et al. 2006; Foster 2007).

Furthermore, mindfulness can be helpful in terms of initial coping by providing the individual with increased emotional insight. The latter involves distress both about one's awareness of a previously hidden unconscious conflict and about one's willingness to apply such an insight effectively (Lazarus 1999). As awareness is one key principle of mindfulness, the relationship is obvious. The same goes for the will to apply the emotional insight, as this can be related to acceptance, another key mindfulness principle. Mindfulness can also aid in the appraisal process itself. Following Lazarus (1999), appraisal comes either by deliberate and conscious effort or in other more automatic and unconscious ways. Mindfulness can be seen as an initial coping effort as one enters a mindful state or mode, with the aim to more constructively choose further functions of coping. In other words, mindfulness is a state that can be entered with an objective of making a secondary appraisal as adaptable to the demands as possible.

This implies that mindful coping stimulates problem-focused and/or emotion-focused coping. As such, awareness can both provide a foundation for problem-focused coping and constitute a conceptual link with problem-focused coping. To some degree it may also correlate positively with emotion-focused strategies, as it is thought to entail qualities such as acceptance and opening for reappraisal, the latter indicating changing appraisal and coping in both behaviour and cognitive coping (Lazarus 1999). Furthermore, as awareness can create an inner distance providing a buffer before acting, there seems to be a causal relation between awareness and appraisal. This indicates that awareness may correlate higher with the other aspects of the MCS than what is the case between the latter three aspects. Distraction can additionally provide a basis for problem-focused coping; however, it may contain elements of both emotion-focused coping and avoidance. The reason for that is that some emotion-focused strategies facilitate approach towards the stressor, whereas others promote avoidance (Stanton and Franz 1999). As part of a mindful coping process, distraction is expected to create mental distance from a stressor and, therefore, mainly correlates positively with emotion-focused strategies.

Preventing negative emotions is overall related to emotion-focused coping, as its focus is on emotions and one's handling of them. It can, however, provide a foundation for problem-focused coping in terms of doing something actively to prevent and prepare for future negative affect. Finally, constructive self-assertion is primarily a problem-focused coping strategy, as it entails an active strategy of focusing on effective communication with others by being aware of useful verbal skills for achieving one's objectives and for maintaining good relationships with others.

Methods

Operationalisation of mindful coping

The initial phase of the operationalisation of the mindful coping construct was to use this theoretical framework to develop a measure for coping with challenges, thus creating an item pool. The main objective of creating an item pool is to systematically sample all content potentially relevant to the target construct (Clark and Watson 1995); that is, the mindful coping construct. In this phase two expert groups were consulted. To create an initial item pool by brainstorming, four therapists familiar with DBT and similar interventions that integrate mindfulness and coping were asked to write down questions and/or statements they believed could measure the construct. This expert group consisted of psychiatric nurses, a specialist in psychiatry and a social worker who all worked in the same psychiatric clinic.

They were all highly motivated to participate in the process of item generation. Their common experience was based on working individually with patients attending interventions containing elements of mindfulness and cognitive psychology, and they had all worked within psychiatric institutions no fewer than 15 and no more than 30 years respectively. None of them were trained in DBT, but they were all familiar with the intervention through seminars. Their backgrounds differed in respect to work areas within psychiatry. Some had more focus on work with outpatients, another had experience from institu-tions for youths, and yet another had experience also from working with inpatients. No limitations were placed on either number of items or content.

All items were introduced to a second expert group comprising seven academics. Their educational background varied from psychology, change management, nursing and social science. However, they were all trained in, and had firsthand experience with, instrument development. This expert group met twice. Its first meeting led to a discussion about the legitimacy of using the four aspects mentioned above as dimensions or subscales for a measurement for mindful coping, as well as which items the measurement could consist of and their wording. The four dimensions were accepted, and the items were placed within each dimension. The suggested items were then revised, with the aim of reintroducing them to the same group. Items considered to be irrelevant or ambiguous to our theoretical approach, were excluded and/or revised during the second meeting. One suggestion was to give short examples on some items to clarify their formulation for the respondents. The list of items was further reduced after a discussion regarding which items best represented the domain of the components from our theoretical approach.

A decision was made to use a five-point Likert-scale (1 = never/hardly ever, 5 = always). The group decisions were based on a general consensus. The item pool of 30 items, based on theoretical arguments as well as results from the expert groups, was expected to provide a basis for developing a measurement that primarily measures the four aspects of the mindful coping construct as theoretically developed from DBT.

The next step was to pilot test the proposed instrument. It was tested both within a group of psychiatric outpatients and a class of high school students. The respondents in the pilot tests were specifically asked to comment on the formulation of items to check for risks of misunderstandings. Some minor adjustments were made in response to their feedback.

Sample

A sample of students from two high schools was recruited to empirically test the measurement model for mindful coping. Both schools have approximately the same number of students, and students from all streams were represented. One school was located in a non-urban area, and the other was close to one of the bigger cities in the region. Both schools recruit students from a variety of social strata and cover all courses of study. Moreover, differences in student samples between schools in Norway are relatively moder-ate (Marks 2006). The current sample is therefore considered to be relatively representative of Norwegian youth in general.

The students' ages ranged from 16 to 20 years. The questionnaire was returned by 750 respondents, which give a response rate of 85%. The data set was reviewed for the quality of responses. Some respondents indicated by written statements in the questionnaire that they had been poorly motivated for filling out the questionnaire in a serious manner. These respondents were removed from the dataset. In addition, respondents with more than 25% of missing items on the MCS-subscales were removed from analyses involving MCS-items,

resulting in a sample of 690 respondents for these analyses. Further, 13 respondents with missing responses to both items on the brief COPE-subscales were removed from analyses involving this scale. The majority of students with low quality responses attended vocational courses of study (84%) and were males (77%). The final sample comprised 51.2% males, 48.8% females, 47.9% vocational course students and 52.1% general educational course students.

Procedure

The school administered the survey in accordance with written instructions from the researcher and the questionnaire was completed during school hours. Statistical analyses included Cronbach's alpha, Pearson product moment correlations and descriptive analyses performed using the SPSS 15 programme (Norusis 2008), as well as confirmatory factor analysis (CFA) using Amos 16 (Arbuckle 2007). The relationship between the MCS and an inventory measuring coping was investigated using Pearson product-moment correlation coefficient.

Percentage of missing data varied between 3.0% and 5.8% for MCS-items and between 0.1% and 2.0% for the brief COPE items. Missing data were replaced by the series mean scores.

Criteria for the confirmatory factor analysis

Goodness of fit of the model is based on criteria regarding the parsimony goodness-of-fit index (PGFI) as introduced by James, Mulaik and Brett (1982). When assessing the overall model fit, the PGFI includes the complexity of the hypothesised model representing the goodness-of-fit of the model (GFI) and the model's parsimony in a single index (Byrne 2001). It has been argued that the PGFI provides a more realistic evaluation of the hypothe-sised model (Mulaik et al. 1989). As parsimony-based indexes have lower values than what is traditionally held to be acceptable for other indices of fit (Byrne 2001), it has been sug-gested that GFI indexes in the .90s and parsimonious-fit indices in the .50s can be expected (Mulaik et al. 1989).

One of the most informative criterions in covariance structure modelling is the root mean square error of approximation (RMSEA) (Byrne 2001). RMSEA values less than .05 indicate a good fit, while values of .08 represent reasonable errors of approximation in the population (Browne and Cudeck 1993). It has been argued that with large sample size, a value of .06 or less indicates a good fit (Hu and Bentler 1999). Values ranging from .08 to .10 indicate mediocre fit, while values grater than .10 indicate poor fit (Byrne 2001). Another index used in the present research is the Tucker–Lewis index (TLI) (Tucker and Lewis 1973), which shows values close to .95 are indicators of a good fit (Hu and Bentler 1999). Finally, the comparative fit index (CFI) is a goodness-of-fit statistic taking sample size into account. A value greater than .90 has been considered to represent a well-fitting model (Bentler and Yuan 1992); however, this value has been revised closer to .95 (Hu and Bentler 1999). A value in between can, therefore, be considered acceptable.

Nomological network validation

The construct validity will also be investigated by correlating the MCS with an inventory that measures coping on the basis of appraisal theory. The brief COPE (Carver 1997) was chosen for this purpose, as it assesses several coping responses known to be relevant to

adequate and inadequate coping strategies and makes minimal time demands on participants. The brief COPE (BC), a measurement modified from the COPE inventory (Carver, Scheier and Weintraub 1989), is an inventory of 14 subscales, each with two items. Coping scales include problem-focused strategies (e.g., active coping), emotion-focused strategies (e.g., emotional support) and avoidant strategies (e.g., substance use). Reported reliability values in terms of alpha values range from .50 to .90 (Carver 1997). In the current study coefficients of reliability ranged from .44 to .86. If the MCS and the BC are variants of the same construct, the instruments are expected to correlate positively on problem-focused coping. For the same reasons, negative correlations are expected to be found with avoidant coping. Correlations with BC's emotion-focused coping strategies are expected to be of varying degrees as such strategies have both adequate and inadequate qualities (Stanton and Franz 1999).

Results

Factor analyses

The mindful coping scale (MCS) was constructed with four subscales to assess four different aspects of mindful coping: awareness, distraction, preventing negative emotions and constructive self-assertion. In order to evaluate the uni-dimensionality or homogeneity of the four subscales we conducted exploratory factor analysis (EFA) of the items constituting each component. The four factors accounted for 56% of the total variance in items with eigenvalues ranging from 1.73 to 6.44. Explained variance ranged from 5 to 26%. However, some items showed less than desirable factor loadings, and based on evaluation of the loadings and theoretical considerations, seven items were deleted from the scale, leaving a total of 23 items.

Confirmatory factor analysis

Confirmatory factor analysis with four latent variables represented by observed variables, shown in Table 1, yielded a fair fit (RMSEA = 0.07; 90% CI 0.063–0.072). Modification indices suggested that the error terms for the observed variables (items) 'Create inner distance to observe the situation' and 'Create inner distance to describe the situation', as well as 'Request (ask) in a manner which maintains a good relation' and 'Request (ask) in a manner which maintain focus on my objectives' should be correlated. When the model was modified as suggested, the results indicated a close fit (PGFI = 0.74, GFI = 0.93, TLI = 0.92, CFI = 0.93, RMSEA = 0.05; 90% CI 0.047–0.057). The coefficient of cor-relation between the error terms was 0.58 and 0.41, respectively. The 23-item, four-factor model provided an acceptable level of goodness of fit (*Chi-square* = 632.2, *df* = 222). To further investigate the discriminant validity of the scale we conducted a confirmatory factor analysis comparing a one-factor solution to the four-factor solution. The results of the alternate one-factor solution clearly indicated a poor fit (PGFI = 0.53, GFI = 0.64, TLI = 0.47, CFI = 0.52, RMSEA = 0.13; 90% CI 0.05–0.06) and hence an unacceptable level of goodness of fit (*Chi-square* = 3063.4, *df* = 230).

Internal consistency for the four subscales was tested using the Cronbach's alpha approach, which indicates the reliability of the subscales. The coefficient alphas of the four subscales ranged from 0.76 to 0.85, all meeting the criterion of an alpha level of minimum 0.7 (Nunnally and Bernstein 1994). The relationship between the subscale scores was investigated using Pearson product-moment correlation coefficient. The coefficients

Table 1. Loadings of each item on the latent variables from confirmatory factor analysis ($n = 690$).

Dimensions and items	Factor 1	Factor 2	Factor 3	Factor 4
Awareness *('When faced with difficult choices, I try to:')*				
Find a balance between reason and emotion	.70			
Consider what is actually going on, not how I wish it should be	.69			
Take a non-judgemental stance	.68			
Create inner distance to observe the situation	.65			
Focus on one thing at a time	.62			
Create inner distance to describe the situation	.60			
Distraction *('To get through difficult moments, I:')*				
Use my touching (touch something comfortable)		.75		
Use my vision (look at something beautiful)		.74		
Use my smelling (smell a scent I like)		.69		
Use my tasting (eat something I like)		.69		
Use my hearing (listen to something I enjoy)		.67		
Affect my emotions (by creating another emotion)		.58		
Use inner pictures (imagine calming scenes)		.54		
Preventing negative emotions *('To prevent negative feelings to arise, I:')*				
Increase my sense of mastery (do something I am good at)			.66	
Stay active			.67	
Work out (get enough exercise)			.64	
Eat right (not too much or too little; food that is good for me)			.62	
Sleep right (not too much or too little)			.51	
Constructive self-assertion *('When making requests or rejections, I try to:')*				
Reject (say no) in a manner which maintains a good relation				.83
Reject (say no) in a manner which maintains my self-respect				.78
Reject (say no) in a manner which maintains my objective				.65
Request (ask) in a manner which maintains a good relation				.65
Request (ask) in a manner which maintains focus on my objectives				.61

Table 2. Mean values, standard deviation, Cronbach's alpha, and correlations of MCS-subscales ($n = 690$).

	Awareness	Distraction	Preventing negative emotions	Constructive self-assertion
Number of items	6	7	5	5
Mean	2.69	2.36	2.69	2.95
SD	0.77	0.82	0.82	0.84
Cronbach's alpha for factors	.83	.85	.76	.84
Correlations with *awareness*		.38**	.38**	.43**
Correlations with *distraction*			.25**	.23**
Correlations with *constructive self-assertion*				.34**

Notes: ** $p < .001$. Scoring range: 1–5.

of correlations ranged from 0.43 for the correlation of awareness with constructive self-assertion, through 0.23 for the correlation of distraction with constructive self-assertion. The MCS-subscale awareness correlates more strongly with distraction, preventing negative emotions, and constructive self-assertion than any of the correlations between the latter three subscales. Results are shown in Table 2.

Mean scores ranged from 2.36 (distraction) to 2.95 (constructive self-assertion). There was a significant tendency for females to report more use than males of both awareness (females: 2.82 (0.67); males: 2.56 (0.85); $p < 0.001$) and of distraction (females 2.63 (0.75); males: 2.08 (0.79); $p < 0.001$). For the other two MCS-subscales, no significant differences in mean scores were found.

Correlation between the mindful coping scale (MCS) and the brief COPE (BC)

The MCS-subscale awareness correlated mainly with problem-focused and emotion-focused coping from the BC-inventory. Distraction correlated strongest with emotion-focused coping and somewhat with avoidant coping. Correlations with problem-focused coping were weak. The MCS-subscale preventing negative emotions correlated mainly with problem-focused coping from the BC-inventory, as well as with some strategies from emotion-focused coping. Correlations with avoidant coping were weaker. Regarding constructive self-assertion, its strongest correlations with the BC-inventory were with problem-focused coping and somewhat with emotion-focused coping. Correlations with avoidant coping were weaker. Correlations are shown in Table 3.

Discussion

The main objective of this research was to develop and validate a scale measuring coping facets of mindfulness. The rationale for a four-factor model was based on the theoretical fundament of dialectical behaviour therapy (DBT); that is, the four aspects of affect, cognition, impulsivity and relationships, as well as the skills for regulating them. It follows

Table 3. Correlations between subscales of the mindful coping scale and the brief COPE ($n = 677$).

	Mindful coping subscale			
Brief COPE subscale	Awareness	Distraction	Preventing negative emotions	Constructive self-assertion
Problem-focused coping				
Active coping	.48**	.14**	.31**	.29**
Planning	.47**	.27**	.28**	.34**
Instrumental support	.38**	.29**	.26**	.24**
Emotion-focused coping				
Emotional support	.39**	.36**	.23**	.22**
Acceptance	.41**	.13**	.23**	.30**
Reframing	.43**	.23**	.31**	.25**
Venting	.36**	.35**	.15**	.29**
Religion	.19**	.18**	.06	.06
Humour	.22**	.15**	.12**	.25**
Self-blame	.25**	.35**	.06	.17**
Avoidance coping				
Self-distraction	.27**	.37**	.11**	.21**
Disengagement	.03	.26**	−.07	.05
Denial	.09*	.32**	.02	.02
Substance use	−.08*	.08*	−.09*	−.06

Notes: * $p < .05$; ** $p < .001$.

from this that the approach to mindful coping is not necessarily completed, as there may be other angles of incidences to this construct. However, here it is argued that the statistical analyses support the initial four-factor model. The dimensionality of the measurement of mindful coping was investigated using both exploratory and confirmatory factor analysis. After already mentioned modifications of the measurement model, confirmatory factor analysis indicated close fit of the hypothesised measurement model of mindful coping. This finding supports the validity of the MCS. Moreover, Cronbach's alphas ranged from 0.76 through 0.85 for the different MCS-subscales, indicating good internal consistencies of the subscales.

Results also showed that the mindful coping dimension awareness yielded the strongest associations with the other aspects of MCS. As awareness (mindfulness) is argued to be initial secondary appraisal, thus stimulating problem-focused coping by constituting the fundamental latent variable in the MCS, awareness not only explained most of the variance but also had the highest correlation with distraction, preventing negative emotions, and constructive self-assertion. As the correlations and the explained variance supported our expectations, this finding also supports the validity of the MCS as awareness opens for coping strategies within distraction, preventing negative emotions, and constructive self-assertion.

A further validation entailed an investigation of associations between the MCS and coping strategies as assessed by the brief COPE (BC). The BC inventory entails subscales of three main categories of both adequate and inadequate coping strategies (problem-focused, emotion-focused and avoidant coping). In line with our theoretical assumptions, the results showed that the MCS-aspect awareness was associated with problem-focused coping. We assumed that taking a step back and becoming more aware of the situation at hand could

be conceptually overlapping with or constitute a basis for problem-focused coping, such as active, planned action or the seeking of instrumental support. On the other hand, this aspect of mindful coping showed mainly low or even negative associations with avoidance coping and some positive correlations with emotion-focused coping. Correlations with emotion-focused coping were expected as awareness entails qualities of both acceptance and appraisal, as mentioned earlier. All in all, it seems that awareness entails a basis for good coping, thus supporting the validity of the subscale awareness.

The subscale distraction was expected to correlate moderately with problem-focused and emotion-focused coping strategies. The subscale correlated somewhat weaker than expected with problem-focused strategies, whereas correlations with emotion-focused strategies were in line with expectations. The weak and positive correlation with acceptance was expected, as one has to accept the situation at hand to use distraction adequately as a coping strategy. A mindful distraction can be used to wind oneself down in a situation causing stressful feelings; for example, by discussing the situation with other people or expressing emotions. On the other hand, the relatively strong correlations with behavioural disengagement or denial were unexpected.

These correlations could be a consequence of a confusion of ideas. In some cases avoiding a stressor, when done mindfully and over a short period of time, may give a person a distance to the problem and necessary room for thought before acting, in this case making distraction an emotion-focused coping strategy. Engaging in distraction in this manner is different from avoidant coping and has been distinguished from such by being labelled 'healthy distraction' (Salovey et al. 1999), referring to appropriate distracting behaviour with functional value. Distraction as denying the experienced stress is avoidance, but the strategies seem to be difficult to distinguish empirically. The same argument can explain the weak correlation with similar strategies within the same scale.

One inference that can be drawn from this is that distraction is not a one-dimensional concept, but it may contain either partially avoidance or healthy distractions that are difficult to distinguish from avoidance coping. The above may point to a further need for investigation and discussion of distraction as adequate coping and for its qualities.

The current research supported the two other factors, that is, preventing negative emotions and constructive self-assertion. As expected, both correlated more strongly with problem-focused coping strategies than with emotion-focused strategies. The majority of correlations with emotion-focused strategies regarding the subscale preventing negative emotions were weaker. This can be explained by the implicit time aspect regarding this form of coping and that preventing negative emotions measures other forms of coping than the BC. Preventing negative emotions refers to what can be done to prevent future stressors to become overwhelming, such as making sure to get enough sleep, eat right and work out. Strategies presented in BC refer mainly to coping strategies used after the stress has occurred, indicating that the BC does not cover coping-building strategies sufficiently, such as what people do to increase coping resources as preparation for future situations. Still, stronger positive correlations were as expected; that is, with problem-focused coping strate-gies. The subscale constructive self-assertion also had fewer positive correlations with the BC, which may be because the first subscale refer to strategies used prior to, or when in, a potential stressing situation with another person. In contrast, the BC refers to what people do either for themselves or towards others with the aim of releasing an already-experienced stressor.

However, positive correlations were as expected, that is, strongest with problem-focused coping. Other positive correlations with emotion-focused strategies varied as expected, as those representing interpersonal strategies correlated stronger than others.

Overall, the subscale showed weaker correlations with avoidant coping strategies from the BC.

In sum, the authors argue that correlations between the MCS scale and the BC scale are concept-related and as expected, indicating that they support the validity of the MCS. Furthermore, the MCS seems to add important coping strategies regarding planned action (secondary appraisal) not present in BC, such as reducing vulnerability to negative feelings (preventing negative emotions) and constructive communication (constructive self-assertion). Therefore, the authors argue that the current research not only supports already established strategies for coping, but also gives rise to a new dimension of coping, that is, mindful coping. An intriguing result from the analysis concerns distraction as coping strategy and whether it can function as good coping or if it indicates avoidant coping. It seems that the line between distraction as healthy and avoidant coping is a fine one. The authors believe that distraction, when done mindfully and over a short period of time, in fact is a healthy coping strategy. However, when done unmindfully and over a longer period of time, it shifts into avoidance (Linehan 1993a; Stanton and Franz 1999). From this, further investigations are needed, considering whether or not this double-edged coping strategy can be measured at all.

Descriptive statistics indicate that constructive self-assertion was the most used mindful coping strategy in this student sample, whereas distraction was the least commonly used. Results also suggest that females more commonly than males use distraction and awareness as coping strategies. More frequent use of awareness may indicate that females to a higher degree focus on the stressor. The tendency for females to report more use of distraction may indicate that an increased use of awareness opens for more use of distraction. This is in line with results that indicated that awareness yielded stronger associations with other aspects of MCS, including distraction. Regardless, the presence of gender differences contributes to the MCS's validity. For the other two MCS-subscales, no significant differences in mean scores were found.

Conclusion

The development of the MCS was theoretically driven from a theory of mindful coping based on a DBT-perspective, and the scale was constructed with four subscales to assess four different aspects of mindful coping: awareness, distraction, preventing negative emotions, and constructive self-assertion. Results from factor analyses supported the proposed measurement model and Cronbach's alphas indicated good internal consistency for the four subscales. Furthermore, correlations with the instrument for measuring coping were mainly in accordance with our expectations. The above supports the validation of our instrument. There were indications, however, that a more thorough investigation of the subscale distraction is necessary. Correlations showed potential ambiguity regarding the use of distraction as a coping strategy.

The authors are hopeful that future studies will contribute to the discussion of distraction as healthy or unhealthy coping. Furthermore, that mindfulness meditation can lead to a re-evaluation and hence facilitation of a shift in the goals of self-regulation, which again can result in the abandonment of problematic goals in favour of more functional and/or realistic goals, shows the potential helpfulness of mindfulness. In addition, as mindfulness also could be used by staff[2] working with young children and/or children with SEBD, ways of measuring the concept through the development of scales for populations of children under the age of the current sample as well as for young people with (S)EBD are important areas for future studies.

Methodological considerations

The use of a student sample may limit the generalisability of our findings. However, several authors have argued that mindfulness is a naturally occurring characteristic likely to show meaningful variations in populations both with and without meditation experience (Brown and Ryan 2003; Kabat-Zinn 2003). Others have also used student populations when developing mindfulness measures (Baer, Smith, and Allen 2004; Cardaciotto et al. 2008). It has additionally been argued that the use of nonclinical populations provides evidence for the theoretical model presented (Cardaciotto et al. 2008), which is also emphasised here. The same argument legitimises the age-range and the various streams to which the student sample belongs, which can strengthen the study's emphasis of mindful coping being a construct with differential roles in psychological functioning as well as not being limited to mental illness. It is hoped that future studies that apply the MCS to other populations will contribute to the instrument's generalisability as well as strengthen the representativeness of the sample in the current study.

Notes

1. 'Dialectics' refers not only to a philosophical world view but also to a treatment approach or strategies used by therapists to effect change (Linehan 1993a); however, as DBT treatment is not the main topic here per se the definition of the term is not further elaborated on.
2. See Crane et al. (2010) for a further discussion on teacher training for the delivering of mindfulness-based interventions.

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