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Mindful Attention Awareness Scale (MAAS): Psychometric Properties of the French Translation and Exploration of Its Relations With Emotion Regulation Strategies

Françoise Jermann
University of Geneva and Geneva University Hospital

Joël Billieux
University of Geneva

Frank Larøi
University of Liège

Arnaud d'Argembeau
University of Liège

Guido Bondolfi
Geneva University Hospital

Ariane Zermatten
University of Geneva

Martial Van der Linden
University of Geneva and University of Liège

Over the past few years, several questionnaires have been developed to measure mindfulness. The Mindful Attention Awareness Scale (MAAS) was created to specifically capture attention and awareness in daily life (Brown & Ryan, 2003). In this article, we present a French adaptation of the MAAS. In the 1st study, we explored the psychometric properties of this adaptation. In the 2nd study, we investigated its relation to cognitive emotion regulation and depressive symptomatology using path analysis. As in the original version of the MAAS, the French adaptation has a strong 1-factor structure. Moreover, there was a negative relationship between the MAAS and the severity of depressive symptoms, both directly and indirectly. The indirect pathway was mediated by the nonadaptive cognitive emotion regulation strategy of self-blame and the adaptive cognitive emotion regulation strategy of positive reappraisal. In conclusion, this questionnaire represents a valid mindfulness measure for French-speaking clinicians and researchers.

Keywords: mindfulness, MAAS, depressive symptomatology, French translation, emotion regulation

The study of mindfulness within the field of psychological and medical research has increased enormously over the last 20 years. Several definitions of mindfulness have been proposed (Brown, Ryan, & Creswell, 2007). For example, it has been defined as a self-regulatory capacity (Brown & Ryan, 2003), as an acceptance skill (Linehan, 1994), and as a metacognitive skill (Bishop et al., 2004). Authors working on mindfulness-based clinical interventions often describe it as "paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally" (Kabat-Zinn, 1994, p. 4).

Reflecting this multiplicity of definitions, over the past few years, no fewer than five questionnaires have been created to measure mindfulness. These questionnaires vary regarding the dimension(s) they are designed to measure and their factorial structure. Two questionnaires were found to be best explained by a multifactorial structure, whereas the other three were best explained by a one-factor structure. Among the multidimensional questionnaires, the Kentucky Inventory of Mindfulness Skills (Baer, Smith, & Allen, 2004) was developed to assess four distinct abilities: observing, describing, acting with awareness, and accepting without judgment. The Toronto Mindfulness Scale (Lau et al., 2006) was created to measure state curiosity and state decentring. Of the single-factor questionnaires, the Freiburg Mindfulness Inventory (FMI; Buchheld, Grossman, & Walach, 2001; Walach, Buchheld, Buttenmuller, Kleinknecht, & Schmidt, 2006) was developed to assess nonjudgmental present-moment observation and

openness to negative experience. It enables the measurement of mindfulness capacities in people who are experienced in meditation. The Cognitive and Affective Mindfulness Scale (CAMS; Feldman, Hayes, Kumar, & Greeson, 2004) was created to evaluate attention, awareness, present focus, and acceptance/nonjudgment with respect to thoughts and feelings in daily experience in people who have no specific experience with mindfulness. A revised version of the CAMS has also been developed (CAMS-R; Feldman, Hayes, Kumar, Greeson, & Laurenceau, 2007). Finally, the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003) measures the tendency to be attentive and aware of present-moment experience in daily life in people who have no specific experience with mindfulness. It is worth noting that the MAAS was developed to measure a disposition that favors attention and awareness (average levels of mindfulness across several days) and that a state or momentary MAAS was also adapted and validated by Brown and Ryan (2003).

In a recent study, Baer, Smith, Hopkins, Krietemeyer, and Toney (2006) examined the factorial structure of mindfulness using five mindfulness questionnaires within a single sample (FMI, MAAS, CAMS, Kentucky Inventory of Mindfulness Skills, and the Mindfulness Questionnaire, which is an unpublished one-factor instrument that enables one to assess a mindful approach to distressing thoughts and images). The authors showed that collectively the mindfulness questionnaires examine five distinct dimensions: nonreactivity, observing, acting with awareness, nonjudging, and describing. On the basis of the results of confirmatory factory analyses, they concluded that four of these dimensions (nonreactivity, acting with awareness, nonjudging, and describing) are elements of an overarching mindfulness construct, whereas the observing dimension has a different status (this research was conducted in a sample without particular meditation experience). To the best of our knowledge, none of these instruments have been adapted into French.

In this study, we present a French adaptation of the MAAS. We chose to validate a French version of the MAAS for two main reasons. First, this self-report instrument is the only one that specifically measures one particular dimension of mindfulness, namely mindful awareness in common daily experiences (acting with awareness dimension). Brown and Ryan (2003) focused on the present-centered attention/awareness aspect of mindfulness, postulating that attention/awareness to the present is a central aspect of empirical work regarding mindfulness. Moreover, according to Brown and Ryan, as well as to Bishop et al. (2004), it is important to distinguish between elements of the mindfulness construct (such as present attention) and outcomes of practicing mindfulness, such as nonreactivity, compassion, or acceptance. In this context, the MAAS is a questionnaire that has the advantage of focusing on a "pure" facet of mindfulness. As well, the MAAS has been shown to be appropriate for exploring the role of present attention and awareness in mindfulness-based interventions such as Mindfulness-Based Stress Reduction (Kabat-Zinn, 1990; also see Brown & Ryan, 2003; L. E. Carlson & Brown, 2005). Correlational and experimental studies have also shown that the MAAS is a reliable, valid instrument for capturing individual differences in the frequency of present-moment attention/awareness over time (Brown & Ryan, 2003). Regarding its factorial structure, a strong single-factor solution was identified as best explaining the data collected in a student sample (17–28 years) and a general adult sample (18–77 years). Confirmatory factor analyses were satisfactory, and the internal reliability of the MAAS was good in both samples. The results also showed good stability over 4 weeks. Moreover, the authors demonstrated that the MAAS measures a dimension that is distinct from self-awareness (weak or nonexistent correlation with self-awareness scales).

Brown and Ryan (2003) also found that mindfulness as evaluated by the MAAS can be enhanced by meditation (Zen) training. Indeed, Zen practitioners have higher MAAS scores (more present attention and awareness) than matched controls who do not meditate. The psychometric validation of the MAAS was further explored by L. E. Carlson and Brown (2005) and MacKillop and Anderson (2007). Both studies confirmed the one-factor structure—the first in a cancer outpatient sample and the second in a university sample. Moreover, MacKillop and Anderson found no gender difference and no difference between people reporting experience with meditation and those who had never meditated. In their view, the latter lack of difference could be related to the characteristics of the sample they studied, which was composed of university students who were characterized as novice meditators and who were not very experienced with or committed to meditative practice.

In the present article, we describe two separate studies. The aim of Study 1 was to validate the French version of the MAAS and to confirm its factorial structure in a sample of adults. Interestingly, Brown and Ryan (2003) showed that present attention and awareness was related to psychological health. Indeed, they found negative correlations between the MAAS and emotional disturbance measures and positive correlations between the MAAS and a variety of indicators of well-being, even though no item in the MAAS directly assesses well-being. In Study 1, the relations between present attention and awareness and psychological health were further examined by measuring dysfunctional attitudes, namely negative, rigid, and extreme assumptions and beliefs about self-worth (Weissman & Beck, 1978) and depressive symptoms.

In Study 2, we extended the investigation of the role of dispositional mindfulness in depressive symptomatology. More specifically, we were interested in determining whether mindfulness has a direct relationship with depressive symptomatology or whether this relationship is mediated (totally or partly) by the effectiveness of emotion regulation strategies. Indeed, it has been shown on one hand that dispositional mindfulness plays a key role in self-regulation (e.g., Baumeister, Heatherton, & Tice, 1994)—defined as the tendency to modulate one's behaviors, thoughts, or emotions (see Ruff & Rothbart, 1996)—and on the other hand that emotion regulation is related to the occurrence of depressive symptoms (Jermann, Van der Linden, d'Acremont, & Zermatten, 2006). To this end, we chose to analyze the links between mindfulness, emotion regulation, and depressive symptomatology by computing distinct models with path analysis.

Study 1: Psychometric Properties of the French Version of the MAAS

The MAAS is composed of 15 items formulated in an indirect way (e.g., "I rush through activities without being really attentive to them") that address cognitive, emotional, physical, interpersonal, and general domains. High scores reflect more present-moment awareness states. The results of Brown and Ryan (2003)

and MacKillop and Anderson (2007) suggest that the MAAS is a good tool for assessing awareness of the present moment, even in people who are not particularly well trained in meditation. In Study 1, we aimed to evaluate the psychometric properties of the French version of the MAAS by investigating its factorial structure. In recent years, mindfulness has been studied in relation to mood disorders, in particular through the development of mindfulness-based cognitive therapy (MBCT; Segal, Williams, & Teasdale, 2002). Segal et al. (2006) showed that, in the context of sad mood provocation, dysfunctional attitudes constitute an important aspect of cognitive vulnerability to depression. MBCT could therefore be a way to deal with the activation of dysfunctional attitudes during heightened sad moods (Segal et al., 2002). For this reason, the links between the MAAS and dysfunctional attitudes (Dysfunctional Attitude Scale [DAS]; Weissman & Beck, 1978) were explored in Study 1. Moreover, we also explored the relationships between the MAAS and measures of depressive symptomatology (Beck Depression Inventory–II [BDI-II]; Beck, Steer, & Brown, 1996).

Method

Participants

A sample of 190 (94 men, 96 women) participants was included in Study 1. The volunteers were recruited by word of mouth among high school students (58% of the sample) and community participants. The participants were 18–34 years of age (mean age = 24.46 years, SD = 3.46), and they had a mean number of 15.09 years of education (SD = 2.19). Ethnic information was not collected, but the sample was predominantly Caucasian.

Materials

MAAS. The MAAS is a 15-item scale introduced by the following sentences: "Below is a collection of statements about your everyday experience. Please answer according to what really reflects your experience rather than what you think your experience should be." People must rate the statements on a 6-point Likert scale ranging from 1 (*almost always*) to 6 (*almost never*). The French version of the MAAS was translated with a back-translation procedure (see, e.g., E. D. Carlson, 2000). One bilingual English–French speaker translated the English version into French. Another bilingual English–French speaker then translated that translation back into English. Discrepancies emerging from this back-translation were discussed, and adjustments to the translation were made.

BDI-II. The BDI-II is a widely used tool for assessing the severity of depressive symptomatology. The 21 items must be rated on a 4-point Likert scale (0–3 points). Scores range from 0 to 63. The French version that was used in this study (Beck, Steer, & Brown, 1998) has shown strong reliability and validity in both clinical (depressed) and nonclinical samples.

DAS. The DAS enables one to measure the dysfunctional beliefs that are often related to depression. The 40 items must be rated on a 7-point Likert scale (1–7 points). Scores range from 40 to 280. The 40-item French version (Form A) was established by Bouvard et al. (1994).

Procedure

Participants were tested individually after they gave their informed consent in writing. The MAAS, BDI-II, and DAS were completed in a single session. The questionnaires were completed anonymously, and no compensation was given for participation.

Results and Discussion

Factorial Structure of the French Version of the MAAS

The number of factors to extract was determined by a Velicer's minimum average partial (MAP) test performed on the correlation matrix (O'Connor, 2000; Velicer, 1976). The covariance matrix was then analyzed with exploratory and confirmatory factor analyses computed with Mplus (Muthén & Muthén, 2006).

Of the 190 participants, one had a missing value and was excluded. The MAP test recommended extracting only one factor. A factor analysis was then performed. The sum of the squared loadings was 4.99, and the factor explained 33.3% of the total variance. The maximum loading for each item was greater than .30, apart from Item 2, which had a loading of .20.

The 15 items of the MAAS then underwent a confirmatory factor analysis (CFA) with maximum likelihood estimation with robust standard errors and a mean-adjusted chi-square statistic test (MLM; Muthén & Muthén, 2006). For the latter analysis, goodness of fit was tested with the chi-square to degree of freedom (χ^2/df) ratio. A model can be considered to fit the data well if its χ^2/df ratio is inferior to 2. In addition to the χ^2/df, we also reported another index that depends on a conventional cutoff (Hu & Bentler, 1999): the root-mean-square error of approximation (RMSEA). An RMSEA between 0 and .05 indicates a good fit, and one between .05 and .08 indicates an acceptable fit. Many authors have used the comparative fit index (CFI) in CFA, and we also report this index. A CFI > .90 is generally interpreted as indicating an acceptable fit. A one-factor model was constructed in which the 15 items of the MAAS were hypothesized to constitute a single latent factor representing the frequency of mindful states over time. The chi-square statistic of the model was significant, $\chi^2(90) = 145.03$, $p < .001$. However, the power of the chi-square is known to increase with sample size, and it has been emphasized (Byrne, 1994) that it is unusual to obtain a nonsignificant chi-square when performing CFA on self-report questionnaires. The χ^2/df ratio is equal to 1.61. For the other fit indices, we obtained an RMSEA of .057 and a CFI of .92. Their combination indicated an acceptable fit. Standardized factor loadings for the 15 items are reported in Table 1. The reliability coefficient (Cronbach's alpha) of the scale is equal to .84, which confirms the good internal reliability of the questionnaire.

Mean MAAS Score and Pearson's Correlations Between the MAAS and the Other Measures

The mean (and standard deviation) for the MAAS was 63.96 (SD = 10.29). There was no difference between men (n = 93) and women (n = 96); men = 63.78 ($\pm$9.63), women = 64.13 ($\pm$10.94); $t(187)$ = −0.23, p = .82.

Regarding the BDI-II and the DAS measures, the data for one and two participants, respectively, were discarded because of missing values. The mean BDI-II score was 7.14 ($\pm$7.07), and the mean DAS

Table 1
Standardized Factor Loadings of the Confirmatory Factor Analysis (N = 190)

No.	Items	Loadings
1	*Il m'arrive d'éprouver une émotion et de ne pas en prendre conscience avant un certain temps.*	.47
2	*Je casse ou renverse des choses parce que je suis inattentif(ve) ou parce que je pense à autre chose.*	.20
3	*J'ai des difficultés à rester concentré(e) sur ce qui se passe dans le présent.*	.60
4	*J'ai tendance à marcher rapidement pour me rendre là où je veux aller, sans prêter attention à ce qui se passe durant le trajet.*	.36
5	*J'ai tendance à ne pas remarquer des sensations de tension physique ou d'inconfort jusqu'à ce qu'elles captent vraiment mon attention.*	.33
6	*J'oublie le nom d'une personne presque immédiatement après l'avoir entendu pour la première fois.*	.33
7	*Il me semble que je fonctionne « en mode automatique » sans être très conscient(e) de ce que je fais.*	.69
8	*Je fais les choses très rapidement sans y prêter vraiment attention.*	.78
9	*Je suis tellement focalisé(e) sur le but que je veux atteindre que je perds de vue ce que je suis en train de faire pour y parvenir.*	.60
10	*Je fais des travaux ou des tâches de manière automatique, sans me rendre compte de ce que je suis en train de faire.*	.76
11	*Je me surprends à écouter quelqu'un d'une oreille tout en faisant autre chose.*	.48
12	*Je me déplace en voiture « en pilotage automatique » et il m'arrive d'être étonné(e) de me retrouver là où je suis.*	.42
13	*Je me surprends à être préoccupé(e) par l'avenir ou le passé.*	.37
14	*Je me surprends à effectuer des choses sans y prêter attention.*	.79
15	*Je grignote sans réaliser que je suis en train de manger.*	.48

score was 116.52 (±28.01), corresponding to usual community sample scores (Beck et al., 1996; Bouvard et al., 1994). Pearson's correlations between the MAAS score and the BDI-II and the DAS were computed. Both were significant—$r_{\text{MAAS, BDI-II}}(188) = -.52, p < .001$; $r_{\text{MAAS, DAS}}(187) = -.52, p < .001$—indicating that the MAAS score was negatively related to indices of poor psychological health.

Study 2: Mindfulness, Emotion Regulation, and Depressive Symptomatology

The results of Study 1 and those from Brown and Ryan (2003) indicate that poor present attention and awareness are related to poor psychological health (e.g., rumination, dysfunctional attitudes, depressive symptomatology). On a conceptual level, Brown et al. (2007) proposed that mindfulness could impact psychological health either directly or indirectly through self-regulation. The direct route refers to the idea that consciously experiencing life moment by moment at a *prereflective* level (i.e., without the intervention of elaborate conceptual processing) is associated with positive affect. Indeed, LeBel and Dubé (2001), for example, showed that people who are attentive while eating chocolate report more pleasure than individuals who are distracted while eating chocolate. The indirect route supposes that mindfulness could enhance well-being through self-regulation processes. Self-regulation corresponds to all cognitive and behavioral processes that are engaged to reduce the discrepancy between what is and what is desired (Carver & Scheier, 1998). Brown and Ryan postulated that mindfulness could allow one to distance oneself from automatic functioning (e.g., automatic thoughts) and in this way could give one the space to more adequately self-regulate.

The aim of Study 2 was to explore how mindfulness is related to depressive symptomatology. The direct and indirect pathways proposed by Brown and Ryan (2003) were explored through path analysis. In Study 2, one specific aspect of self-regulation was addressed, namely emotion regulation. Emotion regulation encom-passes a wide range of conscious and unconscious/automatic physiological, behavioral, and cognitive processes (Gross, 2001). In this study, we focused on cognitive emotion regulation. Moreover, Study 2 also allowed us to investigate the factor structure of the MAAS within a second sample.

Method

Participants

A sample of 240 (113 women, 127 men) participants was included in Study 2. The volunteers were recruited by word of mouth among high school students (36% of the sample) and community participants. The participants were 20–50 years of age (mean age = 29.63 years, $SD = 6.47$) and had a mean number of 15.11 years of education ($SD = 2.61$). Ethnic information was not collected, but the general impression was that the sample was predominantly Caucasian.

Materials

The MAAS and BDI-II are described in Study 1.

Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977). The CES-D is a 20-item scale that assesses the frequency and duration of symptoms associated with depression. The scale was translated into French by Fuhrer and Rouillon (1989). The 20 items must be rated on a 4-point Likert scale (0–3 points). The total score ranges from 0 to 60. Results with the French version of the CES-D indicate that participants scoring at or over a threshold score of 17 for men and 23 for women are considered to have depressive symptomatology. The sensitivity and specificity of the French CES-D with these thresholds were .76 and .71, respectively. O'Rourke (2003) showed that the factor structure of the English and French language versions is comparable (a higher order structure with four separate factors). The

internal reliability score calculated on the data collected in the present study was .87.

Cognitive Emotion Regulation Questionnaire (CERQ; Garnefski, Kraaij, & Spinhoven, 2001). The CERQ is a 36-item scale designed to evaluate the conscious cognitive aspects of emotion regulation. The items must be rated on a 5-point Likert scale (1–5 points). Nine conceptually separate emotion regulation strategies were identified. These can be grouped into adaptive (acceptance, positive refocusing, refocus on planning, positive reappraisal, and putting into perspective) and less adaptive (self-blame, rumination, catastrophizing, and blaming others) strategies. The French version was developed by Jermann et al. (2006) and showed the same factorial structure (nine-factor structure) as the original version. Moreover, the internal reliability indices for adaptive and less adaptive strategies were very good (.89 and .82, respectively). The internal reliability of the subscales ranged from .68 (Acceptance and Catastrophizing) to .87 (Positive Reappraisal).

Procedure

Participants were tested individually after they gave their written informed consent. The MAAS, the BDI-II, the CES-D, and the CERQ were completed in a single session. The questionnaires were completed anonymously, and no compensation was given for participation.

Results and Discussion

Before investigating the relationships between mindful attention and emotion regulation, a CFA was conducted on the MAAS in the Study 2 sample. The procedure was the same as in Study 1. The chi-square statistic of the model was significant, $\chi^2(90) = 154.80$, $p < .001$, and the χ^2/df ratio was equal to 1.72. We obtained an *RMSEA* = .055 and a *CFI* = .92. The combination of the various indices indicated an acceptable fit. Taken together, the results of the CFA of Studies 1 and 2 show identical psychometric properties of the French MAAS in two independent samples.

Data for two participants were missing from each of the CES-D, the MAAS, and the CERQ. Consequently, descriptive and correlation analyses were conducted without these participants' data for these questionnaires. The mean (and standard deviation) for the MAAS was 62.39 ($\pm$10.26). The mean BDI-II score was 8.40 ($\pm$8.31), the mean CES-D was 15.70 ($\pm$8.64), the mean CERQ adaptive strategies score was 64.64 ($\pm$12.32), and the mean CERQ less adaptive strategies score was 34.62 ($\pm$8.07)—all corresponding to usual community sample scores (Beck et al., 1996; Bouvard et al., 1994; Jermann et al., 2006). Pearson's correlations between the MAAS score and scores on the CES-D, the BDI-II, and the CERQ—as well as internal reliability (Cronbach's alpha)—are presented in Table 2.

Correlation analysis showed that present-moment awareness was related to both depressive symptomatology and emotion regulation. Moreover, emotion regulation was also related to depression (see Table 2). Thus, we chose to further investigate the relationship between mindfulness, emotion regulation strategies, and depressive symptoms. In particular, we were interested in determining whether emotion regulation mediates the relationship between mindfulness and depression. To this end, we chose to use path analysis. We computed models with Mplus using the robust

Table 2

Internal Reliability (Cronbach's Alpha) and Pearson's Correlations Between the MAAS, BDI-II, CES-D, and CERQ (N = 240)

Questionnaire	α	Correlations		
		MAAS	BDI-II	CES-D
BDI-II	.92	−.41***		
CES-D	.85	−.43***	.71***	
CERQ				
Acceptance	.71	.01	−.09	−.10
Positive refocusing	.85	.14*	−.21**	−.26***
Refocus on planning	.79	.22**	−.25***	−.24***
Positive reappraisal	.85	.19**	−.30***	−.33***
Putting into perspective	.77	.08	−.14*	−.14*
Adaptive strategies	.88	.19**	−.29***	−.31***
Self-blame	.80	−.29***	.37**	.39***
Rumination	.74	−.12	.35***	.40***
Catastrophizing	.69	−.14*	.35***	.33***
Blaming others	.79	−.12	.25***	.23***
Less adaptive strategies	.83	−.23***	.48***	.49***

Note. MAAS = Mindful Attention Awareness Scale; BDI-II = Beck Depression Inventory–II; CES-D = Center for Epidemiologic Studies Depression Scale; CERQ = Cognitive Emotion Regulation Questionnaire.
* $p < .05$. ** $p < .01$. *** $p < .001$.

standard errors and a mean-adjusted chi-square statistic test (MLM; Muthén & Muthén, 2006). The two participants with missing data were excluded from the analysis. Two models were computed. The first model (Model A) only tested the mediating role of emotion regulation strategies between mindfulness and depression, whereas the second model (Model B) also tested the direct path between mindfulness and depressive symptoms. The models were built with the emotion regulation strategies that significantly correlate with the MAAS, namely positive refocusing, refocus on planning, positive reappraisal, self-blame, catastrophizing, and blaming others. We considered depressive symptoms by using both the BDI-II and the CES-D. Scores on these two scales were Z-transformed and then averaged to obtain a single observed score of depressive symptomatology. The three adaptive emotion regulation strategies (positive refocusing, refocus on planning, positive reappraisal) were allowed to correlate together, which was also the case for the three nonadaptive emotion regulation strategies (self-blame, catastrophizing, blaming others). The indirect effects were computed via the product of coefficient strategy (see, e.g., Preacher, Rucker, & Hayes, 2007) provided by Mplus. To test single parameters, we adopted the 5% significance criterion (i.e., t value of parameters of 1.96). The results show that Model A had a poor fit, $\chi^2(10) = 43.10$, $p < .001$, whereas model B had a good fit, $\chi^2(9) = 14.10$, $p = .12$. Standardized regression weights (b) for the structural model retained (Model B) are illustrated in Figure 1.

As can be seen in Figure 1, the MAAS significantly predicted four of the six emotion regulation strategies entered in the model, namely positive refocusing ($b = 0.14$), refocus on planning ($b = 0.22$), positive reappraisal ($b = 0.19$), and self-blame ($b = -0.29$). In addition, the direct path between present-moment awareness and depressive symptoms is also significant ($b = -0.30$). Moreover, four of the six emotion regulation strategies significantly
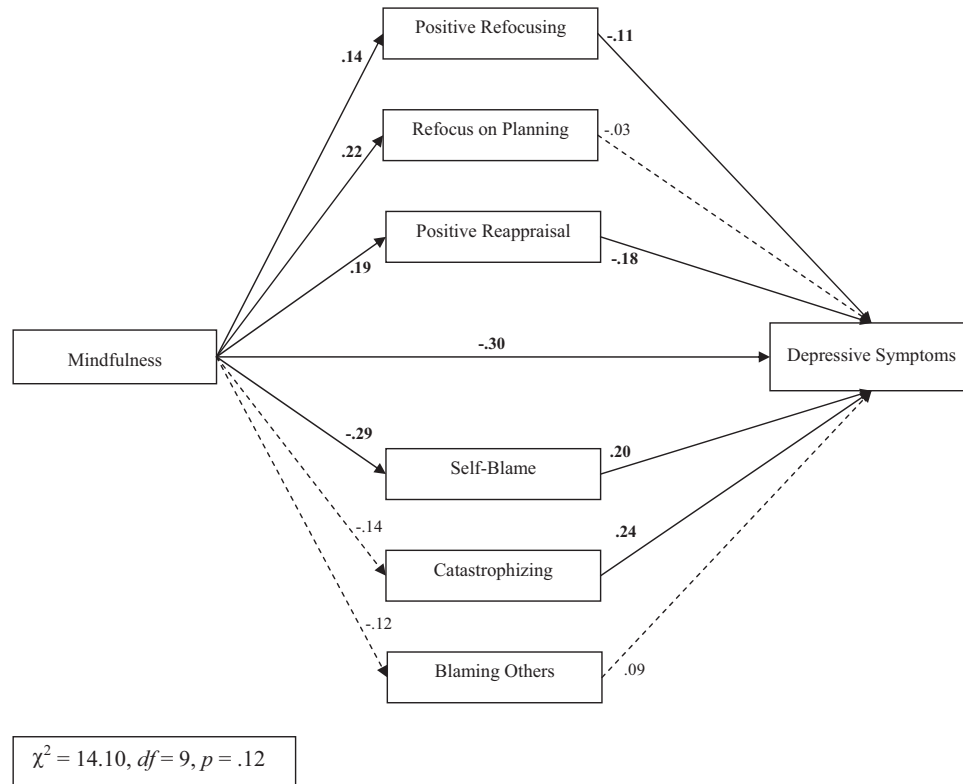
Figure 1. The structural equation model testing the relationship between mindfulness, emotion regulation, and depression (Model B). Values of the single-headed arrows reflect standardized regression weights (bold arrows are significant at the .05 level; dashed arrows represent nonsignificant relations).

predicted the occurrence of depressive symptoms, namely positive refocusing ($b = -0.11$), positive reappraisal ($b = -0.18$), self-blame ($b = 0.20$), and catastrophizing ($b = 0.24$). Tests of indirect effects revealed that two kinds of emotion regulation strategies significantly mediated the relationship between mindfulness and depression (total indirect effect: $b = -0.16$; indirect effect through self-blame: $b = -0.06$; indirect effect through positive reappraisal: $b = -0.03$). This mediation should be considered to be partial (see Preacher & Hayes, 2004) because the direct path between present-moment awareness and depression was also significant ($b = -0.30$). The strong direct path between mindfulness and depressive symptoms remains independent of emotion regulation, which could possibly be due to construct contamination between the two scales used (i.e., certain items of the scales used to measure mindfulness and depression may be semantically very similar). Thus, we conducted an item-by-item analysis of the three scales (MAAS, BDI-II, and CES-D), and one item of each scale was identified as potentially problematic (Item 5 of the CES-D: "I had trouble keeping my mind on what I was doing"; Item 19 of the BDI-II: "Concentration difficulty"; and Item 3 of the MAAS: "I find it difficult to stay focused on what's happening in the present"). Indeed, these three items all refer to attentional difficulties. We reanalyzed the data after removing these three items, and the direct path between mindfulness and depressive symptoms remained quite similar ($b = -0.29$ instead of $b = -0.30$). To sum up, mindfulness (attention and awareness in daily life) is related to

depressive symptoms, both directly and through two kinds of emotion regulation strategies: self-blame (nonadaptive regulation strategy) and positive reappraisal (adaptive regulation strategy).

General Discussion

The aims of the studies described here were (a) to explore the factorial structure of the French adaptation of the MAAS in an adult sample and (b) to examine whether dispositional mindfulness per se is linked to the occurrence of depressive symptoms or whether this relationship is mediated (totally or partly) by the effectiveness of emotion regulation strategies. Studies 1 and 2 showed that a single-factor model was appropriate to explain the data. The internal reliability score of the MAAS was high. Moreover, it was shown that a low level of present attention and awareness is linked to poorer psychological health (depressive symptoms and dysfunctional attitudes). The results of Study 2 indicate that mindfulness was both directly and indirectly related to emotional disturbance (depressive symptomatology). The indirect pathway was mediated by the nonadaptive cognitive emotion regulation strategy of self-blame and the adaptive cognitive emotion regulation strategy of positive reappraisal.

The psychometric properties of the French adaptation of the MAAS are thus similar to those reported by Brown and Ryan (2003) and MacKillop and Anderson (2007) for the original English version. More specifically, a one-factor structure was con-

firmed, meaning that a single score measures individual differences in attention and awareness of what is occurring in the present moment. Furthermore, we found significant relationships between the MAAS and dysfunctional attitudes and depressive symptomatology. This result is also in keeping with Brown and Ryan's findings that mindfulness is negatively related to a range of emotion disturbance measures (e.g., symptoms of depression and anxiety, negative and positive affect) and is positively related to well-being measures (e.g., life satisfaction). Two supplementary correlations should be discussed. First, in the present study it was shown that there was no significant correlation between the MAAS and the Acceptance subscale of the CERQ, even though mindfulness has often been associated with the concept of acceptance (e.g., Baer et al., 2006; Segal et al., 2002). However, as the developers of the MAAS have stated, "items containing attitudinal components (e.g., patience, trust, acceptance) were excluded" to specifically capture present attention and awareness (Brown & Ryan, 2003, p. 825). Brown and Ryan indicated that they assume that acceptance is inherent in attention to/awareness of the present moment. Consequently, the absence of correlation between the MAAS score and the CERQ Acceptance subscale can be better understood. Second, the result showing that there was no significant correlation between the MAAS and the Rumination subscale of the CERQ seems to contradict the significant correlation evidenced by Brown and Ryan (2003) between the MAAS and the Rumination subscale of the Rumination–Reflection Questionnaire (RRQ; Trapnell & Campbell, 1999). As the instruments used to assess rumination were not the same in the two studies, it is important to consider which aspects of rumination these two questionnaires capture. The RRQ was developed in the research area of private self-consciousness and measures rumination as a neurotic, self-attentive thinking style characterized by negative recurrent thoughts about the self (sample items: "My attention is often focused on aspects of myself I wish I'd stop thinking about"; "I often reflect on episodes in my life that I should no longer concern myself with"). The CERQ measures an emotion regulation strategy that consists of thinking about one's feelings and thoughts in reaction to a negative event (sample items: "I often think about how I feel about what I have experienced"; "I want to understand why I feel the way I do about what I have experienced"). However, the RRQ is more attention driven (self-attentiveness) than the CERQ (emotion regulation strategy in reaction to negative experiences), which might explain why the rumination dimension of the RRQ is associated with present attention and awareness on the MAAS, but the rumination dimension of the CERQ is not. Moreover, it should also be mentioned that the RRQ assesses the degree of agreement with the statements, whereas the CERQ measures the frequency of using the rumination strategy to cope with a negative event.

The results of Study 2 also demonstrate that present attention and awareness have both a direct and an indirect link to depressive symptoms. The direct pathway suggests that not living in the present moment (mindlessness) is related to depressive symptomatology. Indeed, our findings indicate that there is a negative relationship between the degree to which one is attentive and aware in daily life and the severity of depressive symptoms. The authors of the MAAS also found evidence of such a relationship (Brown & Ryan, 2003). Regarding the indirect pathway, the findings of Study 2 suggest that a high level of attention to and awareness of the present moment is a predictive factor of a low level of depressive symptomatology through positive reappraisal. Positive reappraisal is an adaptive cognitive emotion regulation strategy thanks to which one can give a positive meaning to negative content. Several therapeutic approaches that are based on or incorporate mindfulness elements suggest that being aware of the present moment enables people to disengage from automatic habits and distance themselves from distressing thoughts or feelings (e.g., Hayes, Follette, & Linehan, 2004; Segal et al., 2002). The present data suggest that being mindful could give people enough space to reappraise negative events in a positive manner, which could help them regulate their mood. In this regard, it has been shown that depressive symptoms are negatively associated with positive reappraisal (Jermann et al., 2006). Moreover, the results of Study 2 suggest that a low level of mindfulness is related to the use of self-blame, a less adaptive emotion regulation strategy. This strategy corresponds to an automatic over-engagement with internal experiences and has been positively linked to depressive symptoms (Jermann et al., 2006).

In summary, it seems that being aware of and attentive to how one is functioning may allow one to adopt more adaptive responses to internal and external experiences and, as a result, may have an impact on depressive symptomatology. However, this hypothesis must be further explored experimentally and clinically.

On a clinical level, two studies indicate that depressive relapses can be prevented with MBCT (Ma & Teasdale, 2004; Teasdale et al., 2002). MBCT has an impact on the occurrence of depressive symptomatology, probably through the two pathways identified in Study 2. For example, mindfulness may affect the occurrence of depressive symptoms through the direct route by means of exercises that require people to be aware of their daily experiences (e.g., when walking or eating). This increases their capacity to be aware and to notice what happens as they have experiences and should give them a way to identify early warnings of a relapse (e.g., negative ruminative thoughts). The indirect route is, for example, targeted by training in a short meditation practice called the *3-minute breathing space*. Such practices are included in the program as a first step when confronted with stressful situations. This meditation enables people to notice what exists in the present, distance themselves from the situation, and gain space to engage in an appropriate response. As they abandon their automatic habits, they can adopt adaptive emotion regulation strategies (e.g., positive reappraisal) more easily. Similarly, other treatments—such as acceptance and commitment therapy (Hayes et al., 2004) or dialectical behavior therapy (Linehan, 1993)—that integrate aspects of mindfulness also aim to decrease experiential avoidance (which means less avoidance of emotions, thoughts, images, memories, and physical sensations) and to decrease overengagement with emotions and thereby increase well-being (Hayes et al., 2004).

Some limitations should also be acknowledged. First, this study is based on nonclinical samples with low levels of depression symptomatology, which generally represent dysphoria rather than depression per se. Further studies in clinically depressed patients are warranted. This seems particularly important as mindfulness-based interventions have been specially developed for patients suffering from mood disorders. Second, as the results are based on cross-sectional designs, the causality of the relationships can only be postulated. From this perspective, a future longitudinal study could validate the hypothesis that low present-moment attention

and awareness may lead to depressive symptoms. Third, it must be acknowledged that Study 2 focuses on cognitive emotion regulation strategies but that other emotion regulation strategies (e.g., behavioral) may also play an important role and should be investigated. Moreover, it should be kept in mind that, in most instruments assessing coping strategies, a majority of items designed to tap emotion-focused coping also contain expressions of emotional distress or self-depreciation (Stanton, Kirk, Cameron, & Danoff-Burg, 2000). In the present study, such confounds could have increased the relationships between certain emotion regulation strategies (e.g., self-blame or rumination) and depressive symptomatology. Thus, further research could benefit from a scale that minimizes this shortcoming, such as the Emotional Approach Coping Scale (Stanton et al., 2000), which explores emotional processing and expression as potentially adaptive strategies for individuals in distress.

In conclusion, the French adaptation of the MAAS offers French-speaking clinicians and researchers an instrument that adequately measures individual differences in attention to and awareness of the present moment. This questionnaire could be a useful tool for investigating the impact of clinical interventions on the basis of the enhancement of mindfulness as well as for exploring the dimension of attention and awareness to the present moment. Moreover, given that mindfulness is a multifaceted construct, it would be useful to develop other validated French translations of scales in the future. In particular, a translation of the Five Factor Mindfulness Questionnaire (Baer et al., 2006), which results from a synthesis of the most recently developed mindfulness questionnaires and measures several facets of mindfulness (nonreactivity, observing, acting with awareness, nonjudging, and describing), would be particularly valuable.

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