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Examining Mindfulness and Its Relation to Self-Differentiation and Alexithymia

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Abstract Research supports the association between mindfulness, emotion regulation, stress reduction, and interpersonal/relational wellness. The present study evaluated the potential effect of mindfulness on some indicators of psychological imbalance such as low self-differentiation and alexithymia. In this cross-sectional study, a sample of 168 undergraduates (72 % women) completed measures of perceived mindfulness (CAMS-R and PHLMS), self-differentiation (S-IPI), and alexithymia (TAS-20). Results revealed positive correlations between the different dimensions of mindfulness and negative correlations between those dimensions, self-differentiation, and alexithymia. The dimensions of quality of mindfulness and acceptance were mediators in the relationship between self-differentiation and alexithymia. A nonsignificant interaction between gender and alexithymia was found. All mindfulness dimensions, but self-differentiation, contributed to explain the allocation of the non-alexithymic group. These results indicate that mindfulness seems to be a construct with great therapeutic and research potential at different levels, suggesting that some aspects of mindfulness seem to promote a better self-differentiation and prevent alexithymia.

Keywords Mindfulness · Alexithymia · Self-differentiation

Introduction

There is a growing interest of psychosocial research in mindfulness and its role in coping with day-to-day stressors (Kabat-Zinn 1990), as well as a treatment for clinical populations (Baer 2003; Segal et al. 2002). However, many aspects of the relationship between mindfulness and emotion regulation still need to be addressed (Hill and Updegraff 2012). Specifically, no study has looked at the direct associations between mindfulness, differentiation of self, and alexithymia. It is well established that poorly differentiated individuals are less flexible and adaptive under stress, since they are less able of modulating the emotional arousal stemming from psychological pressure (Skowron et al. 2004). As a result, these individuals tend to be more emotionally reactive and engage in enmeshed or emotional cutoff relationships in response to stress or overwhelming anxiety (Nichols and Schwartz 2000). Self-differentiation issues are not uncommon in individuals with alexithymic characteristics (Blaustein and Tuber 1998). These individuals suffer a great difficulty on emotional self-expression that might compromise their self-identity (Kets de Vries 2001). Alexithymia generates self and interpersonal problems due to the emotional avoidance of close relationships (Vanheule et al. 2007). On the other hand, low self-differentiated individuals depend on others' approval and acceptance, and they either conform themselves to others, in order to please them, or they attempt to force others to conform to them. They are, as a result, more vulnerable to stress, showing greater difficulties in adjusting/adapting to life changes (Murdock and Gore 2004).

Problems with the activation, experience, and regulation of emotions (negative or positive) are transdiagnostic problems that have been poorly studied (Dillion and Pizzagalli 2010). This type of problems, related to the concepts of self-differentiation and alexithymia, seem to share the common facet of promoting heightened levels of distress, especially at the interpersonal level. In fact, research supports the association between mindfulness, emotion regulation, stress reduction, and interpersonal/relational wellness (Baer 2003; Shapiro et al. 2006). The present study focused on the influence of mindfulness on some indicators of psychological imbalance such as low self-differentiation and alexithymia (Baer et al. 2006).

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Mindfulness, Alexithymia, and Self-Differentiation

The concept of mindfulness was originally inspired by old Buddhist meditation practices. Much of the recent interest in mindfulness and mindfulness-based treatments can be traced to Kabat-Zinn's (1990) mindfulness-based stress reduction program. Mindfulness techniques have been incorporated into several treatments associated with improved health outcomes (Grossman et al. 2004). With this proliferated of findings, researchers have attempted to operationally define mindfulness, including two main components as follows: awareness and attitude (Bishop et al. 2004). However, Cardaciotto et al. (2008) have conceptualized mindfulness as a general tendency towards greater awareness of one's experiences, bringing an attitude of acceptance and non-judgment to these experiences. In fact, an attitude of openness and non-judgment is perceived as a crucial mechanism of change in promoting the positive benefits associated with mindfulness (Shapiro et al. 2006). Although "mindful" individuals may experience negative thoughts, they appear to exhibit a greater ability to "let go" of these thoughts and focus their attention on healthier ways of relating to their experiences (Frewen et al. 2008). The cultivation of mindfulness can create a significant change in the way individuals approach their experiences, allowing the development of greater stability, meaning, flexibility, and less reactivity (Shapiro et al. 2006).

Some individuals have serious difficulties in the understanding and use of emotions and are commonly known as "alexithymic" (Frawley and Smith 2001). Currently, alexithymia refers to a set of interconnected difficulties such as identifying and distinguishing between feelings and bodily sensations of emotional arousal, describing feelings (especially to other people), showing a stimulus-bound externally oriented cognitive style with constricted imaging processes (e.g., lack of fantasies) (Bagby et al. 1994). Hence, people with alexithymia typically think that the causes of their feelings are external rather than internal (e.g., their personal interpretations). The difficulty in understanding emotions particularly considering them incomprehensible or overwhelming and avoiding them is central to a number of recent models of psychopathology (Kring and Sloan 2010). Interestingly, one of the key processes that enable the exploration of emotions is the openness and validation of others, particularly attachment figures, early in life.

According to Bowen's (1976, 1978) family systems theory, healthy adaptation is predicted by family relationships characterized by a balance of both autonomy and connection. This balance is termed "differentiation of self" (Bowen 1978). On an intrapsychic level, differentiation involves one's ability to engage in a thoughtful examination of situations, to maintain full awareness of one's emotions, and to engage in either calm logical reasoning or affective experiencing, depending on situational demands. On an interpersonal level, it involves the capacity to develop an autonomous sense of self while still maintaining close connections with important others, most notably one's family (Bowen 1978; Kerr and Bowen 1988). According to Miller et al. (2004), well-differentiated individuals have the ability to integrate thoughts and emotions and develop intimate contacts, keeping their sense of self, and allowing others to maintain theirs as well. These intimate relationships set an exploratory context for the expression of emotions (Fonagy and Luyton 2009). In the absence of (early) positive attachment and affiliative relationships, emotions may become more dangerous and difficult to explore, think about, or reflect on, even becoming a source of avoidance and alexithymia (Fonagy and Luyton 2009; Fonagy and Target 2006; Liotti and Gilbert 2011; Mikulincer and Shaver 2007).

Mindfulness has been linked to emotional processing (Hayes and Feldman 2004). The concept of mindfulness can be contrasted with alexithymia to the extent that mindfulness encourages open curiosity and attentiveness to inner experiences and becoming familiar with the arising thoughts or feelings, in the body (De la Fuente et al. 2010; Gilbert et al. 2012). The ability to observe inner processes without being overwhelmed, avoidant, suppressant, or acting on them is a core feature of mindfulness. Mindfulness has been found to be negatively linked to alexithymia, difficulties with emotional regulation, and fear of emotions (Lykins and Baer 2009). However, links between mindfulness and self-differentiation are very scarce in the literature (Appel and Kim-Appel 2010).

The Present Study

The first aim of this study was to study gender differences regarding mindfulness, alexithymia, and self-differentiation according to the presence/absence of alexithymia. The second aim focused on the relationships among the variables, expecting mindfulness to be negatively correlated with self-differentiation and alexithymia. The third focus analyzed whether mindfulness (quality of mindfulness, awareness, and acceptance) had mediating effects in the relationship between self-differentiation and alexithymia. Finally, the last aim focused on the contributions of mindfulness and self-differentiation towards alexithymia.

Method

Participants and Procedures

Participants were 168 undergraduates (123 women and 45 men), aged between 18 and 50 years old (M=22, SD=5.94), from a Northern Portugal University. This was a convenience sample with voluntary participation (participants received no compensation). No particular inclusion or exclusion criteria

were defined. Students were enrolled in a variety of programs such as psychology, foreign languages and literature, business, management, sociology, biochemistry, and communication sciences. A cross-sectional design, approved by the ethic committee, was used, in which participants were asked to complete four self-report measures to assess mindfulness, self-differentiation, and alexithymia.

Measures

Quality of Mindfulness The Cognitive and Affective Mindfulness Scale–Revised (CAMS-R; Feldman et al. 2007; Teixeira and Pereira submitted) is a 12-item scale to measure everyday mindfulness. It focuses on the degree to which individuals experience their thoughts and feelings, not requiring meditation training. The instrument assesses mindfulness acquired through life experiences, religious practices, and therapies that do not directly teach mindfulness skills. Items are rated on a 4-point Likert scale from 1 (not at all) to 4 (almost always). Higher scores indicate greater mindfulness qualities that are associated with less experiential avoidance, thought suppression, rumination, worry, and overgeneralization (i.e., spread of activation from a negative event to a negative sense of self) (Feldman et al. 2007). The CAMS-R has been shown to present acceptable levels of internal consistency: α=.81 (Greeson et al. 2011) and α=.77 (Feldman et al. 2007). In the present sample, the Cronbach's alpha was .76.

Present Moment Awareness and Acceptance The Philadelphia Mindfulness Scale (PHLMS; Cardaciotto et al. 2008; Teixeira and Pereira submitted) is a 20-item self-report questionnaire employed to measure two central components of mindfulness: awareness and acceptance. Items are rated on a 5-point Likert scale from 0 (never) to 4 (always). Higher scores in each subscale indicate greater present moment mindfulness capacities. The original alphas were .75 for the awareness subscale and .82 for the acceptance subscale (Cardaciotto et al. 2008). In the present sample, the Cronbach's alphas were .77 and .85 for the awareness and acceptance subscales, respectively.

Alexithymia The Portuguese version of the Toronto Alexithymia Scale (TAS-20; Bagby et al. 1994; Veríssimo 2001) was used. This is a 20-item self-reporting questionnaire that assesses three dimensions of the alexithymia construct. The first dimension reflects the ability to identify feelings. The second reflects the ability to communicate/describe feelings to other people. The third deals with externally oriented thinking. Items are rated on a 5-point Likert scale, from 1 (strongly disagree) to 5 (strongly agree). Higher scores indicate greater alexithymia. A cutoff point of 61 was used to discriminate the presence of alexithymia (Bagby et al. 1994). In the present sample, the subscales "difficulty in identifying feelings" and "difficulty in describing feelings" showed Cronbach's alphas of .82 and .72, respectively. The subscale "externally oriented thinking" showed an alpha of .55 and was excluded from the analysis. The alpha for the total scale was .84.

Differentiation of Self The Separation/Individuation Process Inventory (S-IPI; Christenson and Wilson 1985) is a 39-item scale used to assess disturbances in the separation/individuation process. Items are rated on a 10-point Likert scale, where 1 represents "not at all characteristic" and 10 represent "very characteristic". Higher scores on the inventory indicate problematic, or less resolved, separation–individuation processes. The Portuguese version (Pereira and Machado 2007) includes only 25 items, organized in two main dimensions, "what I think about me" and "what I think about others". In the present sample, the first and second subscales presented alphas of .85 and .56, respectively. Therefore, the last subscale was not taken in consideration in the hypothesis testing. The alpha for the total scale was .83.

Data Analysis

Gender differences were assessed using *t* tests and qui-square. Pearson's correlation coefficients (two-tailed) were used to study associations between mindfulness (quality of mindfulness, awareness, and acceptance), self-differentiation, and alexithymia. In order to test the mediating effects of mindfulness, a multiple regression analysis was performed, according to the causal steps methodology (Baron and Kenny 1986; Preacher et al. 2007). A two-step process was used. First, the direct effect of each of the independent variables was regressed on the outcome variable (step 1). If this relationship was significant (path *c*), then the second and third equations were analyzed (step 2). In the second equation, the mediator was regressed on the predictor variable (path *a*). The third equation involved regressing the outcome variable simultaneously on the predictor (path *c*') and mediator (path *b*) variables. Paths *a*, *b*, and *c* need to be significant. In turn, path *c*' must become zero (full mediating effect) or significantly decrease compared to path *c* (partial mediating effects) (Lindley and Walker 1993). The power analysis for the mediating effects was conducted according to Fritz and MacKinnon's (2007). Therefore, for moderate effects (M=0.39) of a partial mediation (in which the direct effect is also moderate) using the BK test, N=75 was required. However, for a reduction of the direct effect, and consequently a higher mediating effect (M=0.14), N=118 was required. Since our total sample size is 168, the proposed mediation models are adequate. Additionally, a mediation for each subsample (female and male) was performed, and the significant mediating effects were maintained, indicating that the number

of participants according to gender did not have an impact on the results. Finally, a logistic regression was used to test whether mindfulness and self-differentiation allowed a distinction of participants based on the cutoff for presence/absence of alexithymia.

Results

Descriptive and Correlational Analysis

A series of *t* tests revealed only one significant difference between males (N=45) and females (N=123). Males scored higher than females on acceptance subscale from PHLMS ($t(166)=3.06$, $p<.01$). However, these results must be carefully interpreted, as the male sample in this study is considerably smaller. Considering the cutoff point for alexithymia, a significant interaction between gender and alexithymia was not found ($\chi^2(1)=1.010$, $p=.315$).

The means, standard deviations, and associations among the variables studied are shown in Table 1. Pearson's correlation coefficients for mindfulness, self-differentiation, and alexithymia showed that quality of mindfulness was positively correlated with awareness and acceptance and negatively correlated with self-differentiation and alexithymia. Interestingly, awareness was not significantly correlated with acceptance but was negatively correlated with the S-IPI subscale "what I think about me" and only marginally correlated with global self-differentiation. Awareness showed significant negative correlations with alexithymia. As expected, acceptance was negatively correlated with self-differentiation and alexithymia, and these last two variables showed significant positive correlations between them.

Mediating Effects of Mindfulness

The present study analyzed whether mindfulness (quality of mindfulness, awareness, and acceptance) was a mediator in the relationship between self-differentiation and alexithymia (cf. Fig. 1). The direct effects (step 1) of self-differentiation and mindfulness, on alexithymia, were all significant at .001 level. Because each of these regressions was significant, mindfulness was controlled, and the independent variable (self-differentiation) was again regressed on alexithymia (step 2). Mediating effects of quality of mindfulness and acceptance were identified but not awareness ($Z=1.764$, $p=.07$).

For quality of mindfulness as the mediating variable, the relationship had statistically significant results on both the direct effects and after controlling the mediator. The beta value decreased from the direct-effect analysis (.396) to the findings after quality of mindfulness was controlled (.208), indicating that the quality of mindfulness had a mediating effect in the relationship between self-differentiation and alexithymia. As the beta value was significant in both steps of the process, the effects were considered to be partially mediating. The Sobel's test indicated that the indirect effect accounted for a meaningful portion of variance ($Z=4.401$, $p<.001$), and the calculation of the strength of mediation (Baron and Kenny 1986) showed that the relationship between self-differentiation and alexithymia was 56 % mediated by the quality of mindfulness.

For acceptance, as the mediating variable, the relationship also yielded statistically significant results on both the direct effects and after controlling the mediator. The beta between self-differentiation and alexithymia decreased when acceptance was controlled (.396 to .245). Sobel's test indicated that acceptance was a partial mediator of the relationship between

Table 1 Means, standard deviations, and correlations between variables

	M (SD)	1	2	3	4	5	6	7
1. Quality of mindfulness[a]	25.51 (4.45)	–						
2. Awareness[a]	36.78 (5.22)	.332***	–					
3. Acceptance[b]	27.36 (6.17)	.394***	.022	–				
4. What I think about me[c]	47.74 (19.48)	−.439***	−.171*	−.336***	–			
5. Total differentiation of self[c]	89.85 (25.56)	−.399***	−.145+	−.358***	.922***	–		
6. Difficulty in identifying feelings[d]	19.03 (5.62)	−.482***	−.257***	−.529***	.425***	408***	–	
7. Difficulty in describing feelings[d]	14.44 (4.03)	−.546***	−.371***	−.371***	.309***	.293***	.650***	–
8. Total alexithymia[d]	52.20 (11.08)	−.553***	−.399***	−.509***	.411***	.396***	.885***	.833***

+$p<.06$; *$p<.05$; **$p<.01$; ***$p<.001$

[a] CAMS-R (Cognitive and Affective Mindfulness Scale-Revised)

[b] PHLMS (Philadelphia Mindfulness Scale)

[c] S-IPI (Separation–Individuation Process Inventory)

[d] TAS-20 (Toronto Alexithymia Scale)

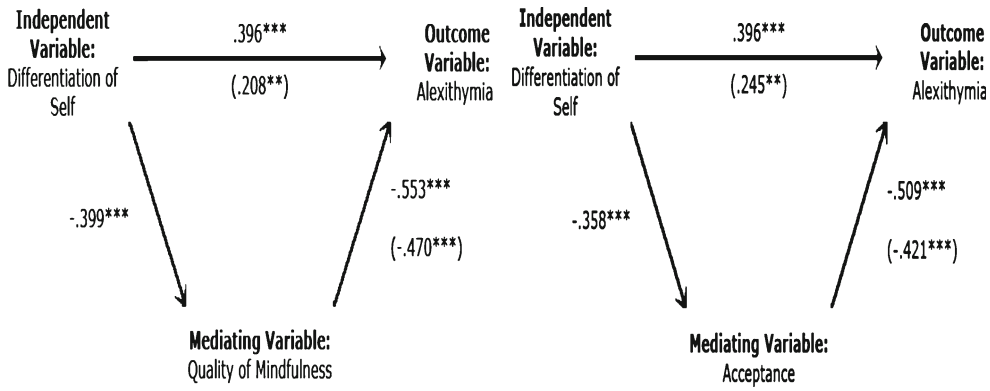

Fig. 1 Mediating effects of quality of mindfulness and acceptance in the relationships between differentiation of self and alexithymia

self-differentiation and alexithymia (Z=3.789, p<.001); when the strength of mediation was calculated, acceptance mediated the relationship between self-differentiation and alexithymia by 46 %.

Predictors of Alexithymia

The logistic regression model ($\chi^2(8)$=4.56, p=.803, Nagelkerke R^2=.389) indicated that mindfulness (quality of mindfulness, awareness, and acceptance), but not self-differentiation, had a significant contribution to explain the allocation of the non-alexithymic group (alexithymic, N=34, 20 %; non-alexithymic, N=134, 80 %), therefore correctly classifying 78 % of the cases (Table 2).

Discussion

The main aim of this study was to explore the relationships between mindfulness, alexithymia, and self-differentiation. With the present sample, there were nonsignificant gender differences in alexithymia (total and subscales). Some previous works have questioned whether there is a detectable gender difference in alexithymia (Heesacker et al. 1999; Levant et al. 2009; Wester et al. 2002), but they have not comprehended or empirically cumulated results across studies. So, considering our first aim, we cannot assert that there are gender differences in terms of global alexithymia or even when considering alexithymia grouping. Bowen (1976, 1978) asserted that there are no significant gender differences in level of self-differentiation. In the present study, this assertion was also true, since there were nonsignificant gender differences in terms of self-differentiation. Using the S-IPI, similar results were found in previous studies (Allen and Stoltenberg 1995; Pereira and Machado 2007; Shiah et al. 1997). Even though, literature on the separation–individuation process further suggests that there could be differences between male and females in terms of how they view the importance of relationships with parents, proposing that relationship factors may play a more important role for women (Lapsley et al. 1989). In fact, in a study with American university students, males reported to have greater

Table 2 Results of the logistic regression for the psychological predictors of alexithymia (final model)

	Alexithymia[a]		
	B (SE)	*OR*	*CI 95 %*
Constant	11.297*** (3.092)		
Quality of mindfulness[b]	−.102* (.052)	.903	[.816 , 1.000]
Awareness[c]	−.129** (.047)	.879	[.801 , .963]
Acceptance[c]	−.196*** (.048)	.822	[.749 , .903]
Differentiation of self (total)[d]	.007 (.009)	1.007	[.990 , 1.025]
R^2 Nagelkerke	.382		
− 2 log	147.412		

N=168. *p<.05.**p<.01.***p<.001

[a] Alexithymic=1, Non-alexithymic=0. CI=Confidence Interval. OR=Odds Ratio

[b] CAMS-R (Cognitive and Affective Mindfulness Scale - Revised)

[c] PHLMS (Philadelphia Mindfulness Scale)

[d] S-IPI (Separation-Individuation Process Inventory)

difficulties in the separation–individuation process when compared to females (Lapsley et al. 2001). The studies that included an analysis based on gender differences in mindfulness qualities, using the CAMS-R, have reported a nonsignificant effect of gender (Brown and Ryan 2003; Catak 2012a; b; Feldman et al. 2007). In the present study, a similar pattern was identified. However, Neff (2003) found that men had higher levels of self-compassion, specifically more mindfulness, than women. In the present sample, gender differences were only significant on the PHLMS acceptance subscale, with men showing higher acceptance (mindfulness component) levels than women. Baer et al. (2004) also observed this same trend when assessing mindfulness skills. Several studies report that women are both less likely to be mindful and more subject to the negative effects of acute stress (Kelly et al. 2008; Merikangas and Pollock 2000). Hence, if mindfulness can protect against negative stress responses, it will be important, in further studies, to determine whether mindfulness does so in a gender-specific manner.

The correlation analysis revealed that, as expected, mindfulness qualities (CAMS-R) were significantly associated with awareness and acceptance (PHLMS), thus indicating the convergent validity of these scales. As in the original study of Cardaciotto et al. (2008), the PHLMS subscales were not correlated (r=.022), suggesting that acceptance and awareness can be conceptualized as separate dimensions of mindfulness and can be independently examined. The fact that almost all the mindfulness components assessed in this study showed strong negative correlations (p<.001) with self-differentiation (total and subscale) and alexithymia (total and subscales) is indicative of the discriminant validity of these components. However, it is noteworthy that the awareness subscale showed some weaker negative correlations, namely with the self-differentiation scale (total and subscale). As expected (Baer et al. 2004), alexithymia showed significant negative correlations with mindfulness scores. The strongest relationships were noted with the CAMS-R (r=-553). This is not surprising, as emotional awareness, attention, present-focus, and nonjudgmental aspects of mindfulness are counterproductive to alexithymia. Some correlational studies support the association between the practice of mindfulness skills and improved emotional regulation (Baer et al. 2006; Hayes and Feldman 2004). So, it is conceivable that awareness and acceptance should be negatively correlated with difficulties in identifying and describing feelings. In other words, these associations suggest that the ability to concentrate fully, with undivided attention, on the activity of the present moment (awareness) and the ability to be more accepting of emotions (acceptance) is less prevalent in those who have more trouble identifying and describing their feelings. Finally, alexithymia and self-differentiation showed strong positive correlations. Alexithymia encompasses issues of interpersonal problems because there is a tendency to avoid emotionally close relationships. If these individuals have more or less close relationships with others, they tend to position themselves as either dependent, dominant, or impersonal, such that the relationship remains superficial (Vanheule et al. 2007). As mentioned previously, inadequate differentiation between self and others, in alexithymic individuals, has also been observed (Blaustein and Tuber 1998).

Mindfulness and well-being have been found to be associated (Brown and Ryan 2003; Rosenzweig et al. 2003). Several psychological processes have been proposed as potential mediators of the beneficial effects of mindfulness interventions, including increases in mindful awareness, reperceiving (also known as decentering, metacognitive awareness, or defusion), exposure, acceptance, attentional control, memory, values clarification, and behavioral self-regulation (Keng et al. 2011). Some studies found that mindfulness could be an important mediator between health-related variables. For example, Richards et al. (2010) found that mindfulness is a significant mediator of self-care importance and well-being in mental health professionals. Coffey and Hartman (2008) found that mindfulness had a significant indirect effect on psychological distress through emotion regulation ability. The authors offer the interpretation that mindfulness leads to increased awareness of negative affective states, alerting the individual to the need to implement coping strategies as a means of dealing with the stressful event. However, some intervention studies (Nyklíček and Kuijpers 2008) reported that increased mindfulness may, at least partially, mediate the positive effects of a mindfulness-based stress reduction intervention.

The findings clearly support a partial mediating effect of mindfulness. This is the first study to show that mindfulness has a mediating effect in the relationship between self-differentiation and alexithymia. According to Bowen (1976), poorly differentiated individuals with a less coherent sense of self are less able to tolerate the experience of strong affect and are unable to distinguish thoughts from feelings. It would make sense, then, that less differentiated individuals would report greater levels of alexithymia. The results of the current study confirm this assumption, with significant positive relationships between the I-SI and the TAS-20, as reported above. Thus, poorly differentiated individuals are more likely to have difficulty labeling and expressing their emotional experiences. Only few previous studies have examined a mediating effect of mindfulness. While several studies reported correlations between change in mindfulness skills and decrease in feelings of distress (Carmody and Baer 2008), a mediating effect of mindfulness has not been found. The fact that awareness was not a significant mediator in our study can be due to the fact that only through acceptance and other qualities of mindfulness (namely, less experiential avoidance, thought suppression, rumination, worry, and overgeneralization) is that difficulties in self-differentiation does not relate to greater alexithymia. The skills of mindfulness suggest that one would be more accepting of the present

moment (about emotions, relationships, as well as self-motivations). Actually, mindfulness could be very connected to differentiation of self, or the ability to relate with others without losing one's healthy sense of self or becoming too emotionally overwhelmed by others (Appel and Kim-Appel 2010) playing, therefore, a prominent role in empathy, a better sense of self, and a decrease in alexithymic characteristics.

In terms of predictors of alexithymia, 20 % of the participants obtained scores above the cutoff on the TAS-20, denoting clinically significant levels of alexithymia. Poorer mindfulness abilities (namely quality of mindfulness, awareness, and acceptance) predicted greater clinical alexithymia. Differentiation of self was not a significant predictor. In fact, studies have shown that mindfulness and stress tolerance are intimately related (Farb et al. 2012; Kabat-Zinn 1990). Individuals high in alexithymia not only lack the ability to use emotions to guide their behavior, but they are also intolerant to stress, showing limited coping resources in the presence of stressful situations (Parker et al. 2001). For example, patients with stress-related disorders show increased prevalence of alexithymic characteristics, compared with normal controls (Martínez-Sánchez et al. 2001), and in turn, individuals with low alexithymia and high optimism have greater resistance to stress and show more indicators of mental and physical health (Mikolajczak et al. 2006). Mindfulness stress reduction effects promote improvements regarding alexithymic characteristics. De la Fuente et al. (2010), with the implementation of a mindfulness stress reduction program, found significant differential effects, in alexithymia and social skills, between subjects before and after the intervention. These results are in accordance with previous correlational studies that support the association between the practice of mindfulness skills and improved emotional regulation skills (Baer et al. 2006; Hayes and Feldman 2004).

Some limitations of this study must be acknowledged. Participants' prior experience in mindfulness practices (or more generally, meditation) has not been assessed. Hence, the possible influence of previous mindfulness experience, in the results, cannot be determined. The exclusive use of self-report measures and the fact that stress variables have not been controlled for are also limitations. Since there were three times more women than men, and due to the fact that the sample was very homogeneous, the present results should be interpreted cautiously.

Future research may benefit from exploring individual differences before and after a mindfulness stress reduction program, not only in alexithymia or social skills (De la Fuente et al. 2010) but also including self-differentiation dimensions. In order to examine the relationships between mindfulness and related measures of psychopathology, replication of these findings with clinical samples is recommended. Since gender differences were found only for the "acceptance" dimension of mindfulness, future research might want to explore with deeper interest gender differences in the separation–individuation process, in mindfulness skills as well as in alexithymia reports.

The present study joins growing evidence regarding mindfulness as an important skill, with important effects on emotional regulation (Nyklíček 2011). While causal links may not be inferred, it is possible that individuals with poor self-differentiation may not allow themselves time or space to stand back and reflect, since they may be anxious about what they would feel if they did stop to reflect (Bowen 1976, 1978). Even though the present results demonstrate that the relationship between self-differentiation and alexithymia is mediated by mindfulness, it is still unknown how helping people to heighten self-differentiation might impact on alexithymic traits, since self-differentiation was not a relevant predictor of clinical alexithymia in the present sample. However, the findings in the present study may have clinical implications. In fact, among low emotional-regulated individuals, reactions to difficult experiences can be filled with frustration, self-criticism, and hostility, increasing the vulnerability to psychopathology, and this trend is actually a current major focus of interest (Dillion and Pizzagalli 2010; Gilbert 2010; Gilbert et al. 2011). These difficulties can be targeted through mindfulness training, as time and space to slow down and reflect on experiences and emotions is a pertinent feature of mindfulness skills.

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