Mindfulness, Stress, and Coping Among University Students

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ABSTRACT

A sample of 135 first-year university students living in residence completed questionnaires that measured individual differences in mindfulness, coping styles, and perceived stress. Findings revealed significant positive relationships between mindfulness and rational coping, and significant negative relationships with emotional and avoidant coping and perceived stress. Regression analyses revealed that avoidant coping and perceived stress predicted 38.2% of the variance of mindfulness scores. Findings from this study improve our understanding of how mindfulness relates to coping styles, thereby suggesting potential ways to enhance counselling services and programming for first-year university students during the often difficult transition to university.

RÉSUMÉ

Un échantillon de 135 étudiants de première année d'université vivant en résidence ont rempli des questionnaires mesurant des différences individuelles d'attention, de styles d'adaptation et de stress perçu. Les résultats ont révélé d'importantes relations positives entre l'attention et l'adaptation rationnelle, et d'importantes relations négatives entre l'adaptation émotionnelle évitante et le stress perçu. Des analyses de régression ont révélé que l'adaptation évitante et le stress perçu prédisaient 38,2 % de la variance des scores relatifs à l'attention. Les résultats de cette étude améliorent notre compréhension de la façon dont l'attention est liée aux styles d'adaptation, ce qui suggère des moyens d'améliorer le service de counseling et les programmes ciblant les étudiants de première année d'université au cours du passage souvent difficile vers l'université.

Recent publications in the domain of mind-body medicine have pointed to a growing interest in mindfulness and its role in coping with day-to-day stressors (Kabat-Zinn, 1990) as well as a basis for treatment with clinical populations (Baer, 2003; Kristeller & Hallett, 1999; Segal, Williams, & Teasdale, 2002). Contributing to the literature, this article describes a study of mindfulness, perceived stress, and coping styles among undergraduate university students. First, however, to provide a basis for this research, clarification of mindfulness and its conceptual framework will be presented, followed by a discussion of the relevance of this topic to a university student population.

Although research on the topic of mindfulness is burgeoning, researchers have yet to reach consensus on a single definition of mindfulness. A frequently cited definition is "an awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience

moment by moment" (Kabat-Zinn, 2003, p. 145). Rooted in the Theravada tradition of Buddhism (Hanh, 1976), mindfulness is a 2,500-year-old Eastern practice of meditation known as Vipassana, or insight meditation (Goldstein, 1976), designed to cultivate increased awareness. Formal mindfulness meditation includes sitting, walking, and movement meditation, but mindfulness can also be practiced through activities of daily life, such as washing the dishes or eating a meal (Kabat-Zinn, 1990; Hanh).

Approaching life mindfully has been shown to have positive psychological effects (Baer, 2003; Brown & Ryan, 2003). As a form of "psychological freedom" (Martin, 1997), mindfulness entails approaching situations without attachment to any particular perspective, and paying attention to one's mental thoughts, emotions, and physical sensations, thus allowing a space where one's "habits of meaning, thought, behavior, or emotion are suspended, reconsidered" (p. 292). The danger of not being mindful and living on "automatic pilot" lies in being unaware of when old habits such as thoughts, emotions, and body sensations are activated. When or if circumstances do come into one's awareness, it may be too late to respond skillfully (Williams & Swales, 2004). For example, automatic reactions following daily stressors (e.g., traffic) might entail directing irritation toward one's partner or family upon returning home, or other coping methods that fail to best meet one's needs in the circumstance.

Through mindfulness, observation of internal experiences and the external situation enables one to notice the connection between making too-quick interpretations and subsequent experiencing of distress (Williams & Swales, 2004). In this "space," one is thus better able to *choose* a response, rather than react reflexively (Bishop, 2002; Kabat-Zinn, 1990). Shapiro, Carlson, Astin, and Freedman (2006) refer to this "space" of disidentification from one's thoughts, feelings, and external contents as a process of "reperceiving" (p. 2). A "meta-mechanism of action," reperceiving is said to overarch other mechanisms, such as self-regulation, values clarification, cognitive, emotional, and behavioural flexibility, and exposure that in turn lead to positive well-being.

Many studies to date have demonstrated the benefits of mindfulness-based treatments for a range of clinical disorders (e.g., Kabat-Zinn, 1982; Kristeller & Hallett, 1999; Marlatt, 2002; Roemer & Orsillo, 2002; Segal et al., 2002). Fewer studies have been conducted with community populations; the benefits of this are, therefore, less known.

A second methodological concern is that the lack of operationalization makes it challenging to empirically test the construct of mindfulness (Bishop, 2002). A number of researchers have attempted to operationalize mindfulness and provide direction in future methods of inquiry (Bishop et al., 2004; Shapiro, Astin, Bishop, & Cordova, 2005). Brown and Ryan (2003) developed the *Mindful Attention Awareness Scale* (MAAS), a 15-item scale that focuses on one's presence or absence of attention to, and awareness of, what is happening in the present moment. The MAAS is a brief and reliable measure with construct validity that can be used in studies with non-meditators. Initial studies of the MAAS revealed individual dif-

ferences in mindfulness as well as significant group differences when comparing beginner meditators with skilled Zen meditators, suggesting that mindfulness skills can be greatly enhanced with practice (Brown & Ryan, 2003). Additional evaluations of the intersections of mindfulness and other factors (e.g., personality traits) accounted for in Brown and Ryan's research is beyond the scope of this article.

Notwithstanding methodological challenges, mindfulness meditation has been shown to enhance one's ability to cope with life's stressors (e.g., Astin, 1997; Chang et al., 2004; Goleman, 1988; Shapiro, Brown, & Biegel, 2007; Shapiro, Schwartz, & Bonner, 1998; Walach et al., 2007) through facilitating self-regulation, values clarification, cognitive, emotional and behavioural flexibility, and exposure (Shapiro et al., 2005). Awareness of arousal from a stressor is heightened through mindfulness practice, which facilitates a quicker return to a state of equilibrium (Hayes & Feldman, 2004; Kabat-Zinn, 1990). If, however, over time one reacts to circumstances automatically and without awareness, as in "automatic-pilot" (Hanh, 1976; Martin, 1997), one may be at risk of experiencing the negative impacts of stress.

Mindfulness, then, can be conceptualized as a feature of self-regulation, which is defined as "the process by which a system regulates itself to achieve specific goals" (Shapiro & Schwartz, 2000, p. 254). To a large extent, self-regulatory skills inform the ways in which individuals anticipate stressful events, thereby increasing the opportunity to avoid or minimize the impact of potential stressors (Aspinwall & Taylor, 1997). This awareness, or mindfulness, a key feature in Brown and Ryan's (2003) Self-Determination Theory (SDT), is thought to enhance self-regulation and, consequently, well-being, in that "the more fully an individual is apprised of what is occurring internally and in the environment, the more healthy, adaptive, and value-consistent his or her behaviour is likely to be" (Brown & Ryan, 2004, p. 114).

In light of the definition of coping as "changing thoughts and acts an individual uses to manage the external and/or internal demands of a specific person-environment transaction that is appraised as stressful" (Lazarus & Folkman, 1984, p. 34), mindfulness can be viewed as a type of self-control strategy (Marlatt & Marques, 1977) to stimuli that may be negatively stress provoking.

A potentially stressful time is the transition undergraduate students experience entering university (Arthur & Hiebert, 1996). Here, students face changes that will have both short- and long-term impacts on their lives (Evans, Forney, & Guido-DiBrito, 1998), for example in the areas of interpersonal relations, particularly with parents, religious views, and sexuality (Lefkowitz, 2005). It is thus perhaps not surprising that many students new to university use alcohol, illicit drugs, and cigarettes to cope with this stress (Adlaf, Demers, & Gliksman, 2005).

The potential for mindfulness practice to help buffer some of the negative stressors associated with university has been shown in a number of studies with university-student-aged populations (Astin, 1997; Shapiro et al., 1998). In their study that assessed the effects of a mindfulness-stress-reduction program with medical and premedical students, for example, Shapiro et al. (1998) concluded

that participation in mindfulness training can aid in reducing students' state and trait anxiety and reducing overall symptoms of psychological distress, including depression, while increasing empathy and experiences of spirituality. Findings from this study show promise for mindfulness training for students in nonmedical disciplines who also experience stress, anxiety, and depression at the transitional phase of university.

In light of the theorization of mindfulness as a feature of self-regulation, in the present study it was hypothesized that individuals who score high on mindfulness will report less perceived stress. A second hypothesis stated that individuals who score high on mindfulness will use more rational and detached coping strategies, and less emotional and avoidant styles (e.g., Roger, Jarvis, & Najarian, 1993).

METHOD

Participants

With the cooperation of the Division of Housing and Ancillary Services at the University of Western Ontario, London, 1,200 first-year students (from a possible 4,346) living in residence were randomly selected to receive a questionnaire package that included a letter of information explaining the purpose and objectives of the study, a survey of demographical information, the *Perceived Stress Scale* (Cohen, Kamarck, & Mermelstein, 1983), the *Coping Style Questionnaire* (Roger et al., 1993), and the *Mindfulness Attention Awareness Scale* (Brown & Ryan, 2003). Of the subject pool, 2,445 were female and 1,901 were male, and the majority of students were geographically located in the Greater Toronto area and Southwestern Ontario. Of the 1,200 packages distributed, 137 were returned, yielding a return rate of 13.5%, with 135 packages completed and included in the study. Though small, this return rate is sufficient to meet the standards of thorough statistical analyses (Rosnow & Rosenthal, 2006).

Instruments

GENERAL DEMOGRAPHIC QUESTIONNAIRE

A one-page survey designed by the authors of the present study was used to solicit information regarding participants' age, gender, ethnicity, and previous experience with mindfulness. As no further details on the types of experiences were elicited, the authors cannot make any inferences about the effect of such experiences; it is presented here as contextual information.

PERCEIVED STRESS SCALE (PSS)

The 14-item PSS (Cohen et al., 1983) assesses participants' current level of stress and the extent to which they find their lives uncontrollable, unpredictable, and overwhelming. Participants indicated how often they felt or thought a particular way in the last month on a Likert-type scale (0 = *never*, 1 = *almost never*, 2 = *sometimes*, 3 = *fairly often*, 4 = *very often*). Sample items include "In the last

month, how often have you felt that you were unable to control the important things in your life?" and "In the last month, how often have you felt that things were going your way?" PSS scores are obtained by reverse scoring (e.g., 0 = 4, 1 = 3, etc.) on the positive items (items 4, 5, 6, 7, 9, 10, and 13) and summing across all 14 items. A high score indicates a high level of perceived control, hence a lower level of current stress, while a low score indicates a low level of perceived control and a higher degree of perceived stress.

Coefficient alpha reliability for the PSS has been reported at .84 and .85 (Cohen et al., 1983). Evaluated for concurrent and predictive validity, the PSS correlated in the expected manner on measures of life-events, stress measures with depressive symptomatology, and scores of health centre utilization (Cohen et al.). The PSS was revealed to be more closely related to a life-event impact score, which is based on one's appraisal of an event, and was shown to be a better predictor of health and health-related outcomes than the two life-event scales. Though highly correlated with depressive symptomology, the PSS was found to measure an independent predictive construct.

COPING STYLE QUESTIONNAIRE (CSQ)

The CSQ (Roger et al., 1993) is a 60-item scale that measures coping styles in four factors: Rational Coping (RATCOP), Detached Coping (DETCOP), Emotional Coping (EMCOP), and Avoidance Coping (AVCOP). Participants are instructed to describe how they typically react to stress by circling "Always" (A), "Often" (O), "Sometimes" (S), or "Never" (N) for each item (where Always = 4 points, and Never = 1 point). Participants' scores are summed to create a score for each of the four subscales.

RATCOP. A 16-item scale that assesses active, problem-solving type of coping (e.g., "Try to find out more information to help make a decision about things").

DETCOP. A 15-item scale that assesses participants' detached coping style (e.g., "Feel independent of circumstances"). High scores on RATCOP and DETCOP are conceptualized as an adaptive style of coping (Roger et al., 1993).

EMCOP. A 16-item scale that denotes an emotion-oriented style of coping (e.g., "Feel worthless and unimportant" and "Feel overpowered and at the mercy of the situation").

AVCOP. A 13-item scale that deals with avoidant-type coping behaviour (e.g., "Daydream about times in the past when things were better"). According to Roger et al. (1993), high scores on EMCOP and AVCOP are conceptualized as maladaptive.

Alpha levels of internal consistency for Rational Coping are .81 (Elklit, 1996) and .85 (Roger et al., 1993), .79 (Elklit) and .73 (Roger et al.) for Emotional Coping, .66 (Elklit) and .69 (Roger et al.) for Avoidant Coping, and .77 (Elklit) and .90 (Roger et al.) for Detached Coping, which are within an acceptable range (Briggs & Cheek, 1986).

Concurrent validity for the CSQ was assessed using the *Emotion Control Questionnaire* (ECG; Roger & Najarian, 1989), a measure that evaluates delayed

recovery from stress. The analyses indicated a consistent pattern of results, namely, the ECQ Rehearsal Scale (i.e., tendency to ruminate on upsetting events) was significantly positively correlated with both of the maladaptive scales of the CSQ (EMCOP and AVCOP) and significantly negatively correlated with the adaptive scales of the CSQ (RATCOP and DETCOP). Emotion Inhibition (ECQ) was significantly positively correlated with AVCOP, and Benign Control correlated significantly with RATCOP, DETCOP, and EMCOP, but in the opposite direction to Rehearsal, thus indicating that impulsives tend to use more emotional, and less rational and detached, coping styles. Finally, no significant correlations were found between aggression control and the CSQ factors. Taken together, these results provide evidence for construct validity of the measure.

MINDFULNESS ATTENTION AWARENESS SCALE (MAAS)

The MAAS is a 15-item, 6-point Likert scale (1 = *almost always* to 6 = *almost never*) designed to assess participants' frequency of mindfulness over time, specifically the presence or absence of attention to and awareness of what is happening in the present moment (Brown & Ryan, 2003). Participants' responses on each item are summed to create a total score. Sample items include "I rush through activities without being really attentive to them" and "I find myself doing things without paying much attention." A high score indicates a high degree of mindfulness. Cronbach alphas for the MAAS range from .80 to .87 across samples (Brown & Ryan, 2003). On analyses of convergent and discriminant validity, the MAAS was found to be appropriately both positively and negatively related to other measures of well-being consistently in the expected directions (Brown & Ryan, 2003).

RESULTS

Participants

Descriptive data and measures of central tendency indicated that of the final sample of 135 participants, 91 (67.4%) were women and 44 (32.6%) were men, with a mean age of 17.9 years (*SD* = 1.24, age range = 6–21 years). Participants identified as the following: 88 Euro-Canadians (65.2%), 27 Asians (20%), 2 Indo-Canadians (1.5%), 2 First Nations (1.5%), 1 Inuit (1%), and 14 as "Other" (10.4%). Seven participants (5.2%) reported having previous mindfulness experience and 128 (94.8%) reported having none.

Scores

The mean score on the PSS for the current sample was 23.38 (*SD* = 8.76), an almost equal score with those reported in previous literature (e.g., 23.45; Cohen et al., 1983). Scores on the CSQ were separated by gender to identify possible differences in coping, as previous research has cited divergent coping styles between females and males (Porter & Stone, 1995). Mean items scores for RATCOP were 25.12 (*SD* = 7.2) for females and 27.36 (*SD* = 6.85) for males; for DETCOP, 15.9 (*SD* = 5.71) for females and 21.9 (*SD* = 7.11) for males; for EMCOP 16.48 (*SD*

= 7.79) for females and 15.04 (*SD* = 9.55) for males; and for AVCOP, 16.51 (*SD* = 5.23) for females and 15.73 (*SD* = 4.98) for males. These scores are comparable to mean scores from the original study of the CSQ (Roger et al., 1993). On the MAAS, the mean item score for females in the present study was 3.99 (*SD* = .875) and 3.86 (*SD* = .842) for males, which are similar to those found in Brown and Ryan's (2003) university student sample (e.g., 3.72, *SD* = 1.25).

Correlations

Pearson's product-moment correlation formula was used to measure the relationships among perceived stress, coping styles, and mindfulness. Correlations among the major variables within the present study are detailed in Table 1. Of note is the significant negative correlation found between mindfulness and perceived stress, thus showing some support for the hypothesis that individuals who are more mindful will experience less perceived stress. The hypothesis that individuals who are more mindful will use rational and detached styles of coping, and less mindful individuals will use emotional coping and avoidant coping was also supported, with the exception of detached coping. Incongruent with our hypothesis, there was no correlation found between mindfulness and detached coping.

Table 1
Correlation Matrix for Hypotheses Variables (N = 135)

	PSS	MAAS	RATCOP	DETCOP	EMCOP	AVCOP
PSS	1.00	-.222*	.186*	-.101	.151	-.014
MAAS		1.00	.239*	.162	-.486**	-.508**
RATCOP			1.00	.683**	-.513**	-.224**
DETCOP				1.00	-.449**	.033
EMCOP					1.00	.487**
AVCOP						1.00

Note. PSS = Perceived Stress Score (Cohen et al., 1983), MAAS = Mindfulness Attention Awareness Scale (Brown & Ryan, 2003), RATCOP = Rational Coping, DETCOP = Detached Coping, EMCOP = Emotional Coping, AVCOP = Avoidant Coping, RATCOP, DETCOP, EMCOP, AVCOP = Coping Styles Questionnaire (Roger et al., 1993).
*$p < .05$. **$p < .01$.

Multivariate and Univariate Analysis of Variance

A MANOVA was conducted with sex as the independent variable on the group of outcome variables, mindfulness, perceived stress, and coping styles (RATCOP, DETCOP, EMCOP, and AVCOP). Using Pillai's trace as a testing method, as it is a more robust measure (Olson, 1976), a multivariate effect was detected, $F(1, 128) = 7.8$, $p < .01$, $\eta^2 = .31$. That is, 31% of the variance in the collection of the 5 dependent variables is accounted for by sex. Results of univariate analyses conducted to identify the particular variables contributing to this significant effect

revealed significant effects for sex for both RATCOP, $F(1, 128) = 4.01$, $p < .05$, $\eta^2 = .03$, and DETCOP, $F(1, 128) = 27.49$, $p < .01$, $\eta^2 = .18$.

Three groups were formed according to their mindfulness scores so we could conduct a MANOVA with mindfulness as the independent variable. Forty-four participants met the criterion for low mindfulness (group 1), with a cut-off score of 3.67 at the 33rd percentile. Forty-four participants, who had scores between 3.38 and 4.39 and were between the 34th and 65th percentile, made up the medium mindfulness group (group 2), while the high mindfulness (group 3) consisted of the 42 individuals who obtained a score of 4.40 or higher, and scored at or above the 66th percentile.

Using these three levels of mindfulness as the independent variable with the group of all other dependent variables (PSS, RATCOP, DETCOP, EMCOP, and AVCOP), we conducted a second MANOVA that revealed a significant effect, $F(2, 127) = 6.34$, $p < .01$, $\eta^2 = .24$. Univariate analyses conducted to identify which of the dependent variables were influenced by level of mindfulness showed significant effects with all variables (PSS, $\eta^2 = .20$, RATCOP, $\eta^2 = .13$, DETCOP, $\eta^2 = .07$, EMCOP, $\eta^2 = .23$, and AVCOP, $\eta^2 = .25$). Results of univariate analyses (seen in Table 2) thus indicate that level of mindfulness is, as predicted, associated with levels of perceived stress and to various styles of coping, such as rational, detached, emotional, and avoidant.

Table 2
Results of Univariate Analyses using MAAS as the Independent Variable and Other Major Variables as Dependent Variables

MAAS	*df*	F	*p*
PSS	2, 127	15.92	.000**
RATCOP	2, 127	9.47	.000**
DETCOP	2, 127	4.86	.009**
EMCOP	2, 127	19.16	.000**
AVCOP	2, 127	21.19	.000**

Note. PSS = Perceived Stress Score (Cohen et al., 1983); MAAS = Mindfulness Attention Awareness Scale (Brown & Ryan, 2003); RATCOP = Rational Coping, DETCOP = Detached Coping; EMCOP = Emotional Coping; AVCOP = Avoidant Coping; RATCOP, DETCOP, EMCOP, AVCOP = Coping Styles Questionnaire (Roger et al., 1993).
*$p < .05$. **$p < .01$.

To identify specific differences in comparing the three levels of mindfulness on the dependent variables, Tukey's post hoc comparison tests were conducted with perceived stress, RATCOP, DETCOP, EMCOP, and AVCOP (see Table 3). The results suggest that levels of mindfulness are associated with levels of perceived stress scores and coping styles scores. As predicted, there is a significant difference between individuals with low mindfulness and high mindfulness on perceived stress. With rational and detached coping, significant differences were found

between the low mindfulness and high mindfulness groups and the medium and high mindfulness. The high mindfulness group is a significant factor compared with emotional coping when comparing low versus high mindfulness and medium versus high, however not so with the low versus medium group. All levels of mindfulness were significant when compared with avoidant coping.

Table 3
Results of Post hoc Tests of Mindfulness Groups with Dependent Variables

MAAS	Mean	Group Comparison	*p*
PSS			
1	2.05	2	.001**
2	1.59	3	.196
3	1.38	1	.000**
RATCOP			
1	1.52	2	.935
2	1.49	3	.000**
3	1.85	1	.001**
DETCOP			
1	1.12	2	.955
2	1.09	3	.014*
3	1.36	1	.031*
EMCOP			
1	1.24	2	.143
2	1.06	3	.000**
3	.65	1	.000**
AVCOP			
1	1.47	2	.029*
2	1.28	3	.000**
3	.99	1	.000**

Note. 1 = Low Mindfulness (n = 44); 2 = Medium Mindfulness (n = 44); 3 = High Mindfulness (n = 42); RATCOP = Rational Coping; DETCOP = Detached Coping; EMCOP = Emotional Coping; AVCOP = Avoidant Coping; RATCOP, DETCOP, EMCOP, AVCOP = Coping Styles Questionnaire (Roger et al., 1993).
*$p < .05$. **$p < .01$.

Regression

Having found some evidence to support the important role of mindfulness in relation to perceived stress and coping styles using the multivariate and univariate analyses, we completed regression analyses using mindfulness as the independent variable in order to ascertain whether knowledge of levels of perceived stress and particular styles of coping (RATCOP, DETCOP, EMCOP, and AVCOP) can predict level of mindfulness. Using a Stepwise method, as it incorporates only variables

that have a significant contribution to the regression equation, we obtained results showing that AVCOP alone explains 24.3% of the variance of mindfulness scores, and was significant, $F(1, 128) = 42.42$, $p < .001$. Adding PSS scores to AVCOP showed a significant increase in R^2, with an additional 13.9% of the variance of mindfulness scores explained, $F(2, 127) = 40.83$, $p < .001$.

Given that sex was a significant factor in the MANOVA analyses, linear regressions were executed for females and males separately in order to identify any differences in patterns between sexes in predicting mindfulness scores. Using a Stepwise method, with mindfulness as the dependent variable and examining only females' scores, EMCOP, AVCOP, and PSS explained 38.4% of the variance of mindfulness scores, and was significant, $F(3, 84) = 19.08$, $p < .01$. Using males' scores on mindfulness, a Stepwise method was conducted for a regression and revealed AVCOP as predicting 32.5% of the variance in mindfulness scores, a significant result, $F(1, 41) = 21.24$, $p < .01$. A significant increase in R^2 was found with the inclusion of PSS scores, with an additional 9.9% of variance of mindfulness scores, $F(2, 40) = 16.45$, $p < .01$. These separate analyses by sex suggest differences in the prediction path of mindfulness scores where EMCOP is a significant predictor only for females.

DISCUSSION

The statistical analyses presented here revealed significant relationships between mindfulness and rational coping, and significant negative relationships with emotional and avoidant coping, and perceived stress. The results of this study thus show support for the hypothesis that mindfulness may increase one's ability to cope with stress, given the finding that participants with a high level of mindfulness scored significantly lower on the PSS. The results are therefore consistent with previous research that has shown a relationship between mindfulness meditation and stress reduction (e.g., Astin, 1997; Chang et al., 2004; Goleman, 1988; Shapiro et al., 2007; Walach et al., 2007).

That individuals who scored high in mindfulness also scored lower in perceived stress may show support for Brown and Ryan's (2003) contention that enhanced mindfulness may allow individuals to experience less stress through acting more congruently in their environments, and hence be better able to meet their needs and act consistently with their values. Further, the finding that mindfulness was significantly positively related with an adaptive coping style (RATCOP) and significantly negatively related with maladaptive coping styles (EMCOP and AVCOP) may strengthen support for Shapiro et al.'s (2005) theory of reperceiving as a core component of mindfulness, a concept that speaks to cognitive, emotional, and behavioural flexibility, which are certainly pertinent to positive coping skills.

Although Roger et al. (1993) proposed rational and detached coping as adaptive and emotional and avoidant coping as maladaptive, the present findings did not find show support for this conceptualization, with rational coping significantly

positively related to perceived stress, and slightly negatively related to avoidant coping. Moreover, the high shared variance of the coping scales found in the present analysis suggests a lack of clear distinction and a definitive prediction based on individual coping styles. For instance, maladaptive coping styles may not necessarily be consistently negative depending on the circumstances; this is also the case for adaptive coping styles. Further research is therefore needed to elucidate the relationship between perceived stress and coping styles identified by Roger et al. (e.g., rational, detached, emotional, and avoidant coping).

Levels of Mindfulness

Results of the post hoc analyses were helpful in identifying differences between individuals based on their level of mindfulness (e.g., grouped in either low, medium, or high mindfulness). With regard to perceived stress, significant differences were found only between the low mindfulness group and both medium and high mindfulness groups, but not between medium and high, suggesting that perhaps there is little difference between medium and high mindfulness with respect to one's level of perceived personal control and the extent to which one experiences stress. This finding points to the possibility that low mindfulness is a potential indicator of risk for perceived stress.

With regard to rational, detached, and emotional coping, significant results were found between medium and high mindfulness groups as well as low and high mindfulness groups, but not between low and medium mindfulness groups. Post hoc results with avoidant coping were all in the expected direction, with individuals who are more mindful reporting that they engage in less avoidant coping, which is congruent with the conceptualization of mindfulness as being in opposition to avoiding one's experiences (Brown & Ryan, 2003; Kabat-Zinn, 1990).

Implications for Professional Practice

The findings from the current study convey several practical implications for student development. Providing support for adaptive qualities of mindfulness, the current findings imply that the ability to remain aware of one's present moment experiencing is an adaptive approach to coping with stress, which may be particularly relevant during the transition to university.

Adjusting to university can be a particularly stressful time, as moving from adolescence to the demands and responsibilities of university can be challenging. High rates of illicit drug, nicotine, and alcohol use among university students (Adlaf et al., 2005) may reflect students' reliance on these substances to cope during this difficult stage.

The significant negative relationship shown in the present study between mindfulness and perceived stress supports the potential for mindfulness to ameliorate individuals' physiological difficulties (Kabat-Zinn, 1990) and enhance one's psychological well-being (Baer, 2003). Finding these results in a university student population adjusting to the transition to university (students completed the measures within the first three months of university)complements previous

studies that have shown that the practice of mindfulness can decrease stress in university students (Astin, 1997; Shapiro et al., 1998).

Moreover, the finding that individuals low in mindfulness tend to experience a higher degree of perceived stress points to possible areas of risk assessment of students' coping abilities and levels of emotional and psychological functioning. For instance, including the MAAS in the intake or assessment processes with students seeking services in university counselling centres may help clarify students' coping abilities. Clinicians who find students scoring low in mindfulness may then consider further assessment of students' stress and coping styles as well as incorporate mindfulness-oriented interventions as part of treatment.

The integration of mindfulness-based skills in counselling is certainly plausible, as we know from previous research that mindfulness can be taught and enhanced through practice (Brown & Ryan, 2003; Kabat-Zinn, 1990). Identifying mindfulness as an adaptive approach to coping with stress, therefore, holds important implications for counselling students who experience the transition to university as particularly stressful.

The findings from this study may also serve to bolster support for Brown and Ryan's (2004) SDT model that proposes health-enhancing and stress-buffering features of mindfulness. For instance, the finding that students who scored high in mindfulness experienced less perceived stress and tended to engage in a rational, adaptive, coping is consistent with the notion in SDT that individuals with a high level of mindfulness, or awareness of their internal and external experiencing, are more likely to behave in ways that are consistent with their values. As such, they are more likely to adapt to stressors in their environment, regulate their emotions, and meet their needs (Brown & Ryan, 2004). This knowledge implies that helping students who seek counselling services develop self-regulatory skills, such as mindfulness techniques and practices, may assist them in meeting the demands of their environment while healthily adapting to the stress associated with the transition to university.

Given the high rates of perceived stress in the current study, and in light of participants' completion of the measures in the first term of university, implications of the present findings point to the potential that mindfulness courses and instruction may best aid students earlier rather than later in their first year of university. Future studies assessing differences in perceived stress and coping styles in the second university term compared with the first term may shed light on students' adaptation to the transition to university, and hence the best time to offer instruction in mindfulness practice.

Strengths and Limitations

Strengths of the present study include the use of standardized measures and randomized selection of the sample, which allows for a level of rigor necessary to confidently draw conclusions about the relationships between the variables. Another benefit of the current study is that its results can be compared with other university samples, and with Canadian populations in particular.

While the number of participants included in the final sample was sufficient, a larger number of participants may have expanded conclusions. An additional limitation of the current study is that attention to mindfulness, perceived stress, and coping styles may have entailed the omission of other factors that influenced the results. Finally, the distinctiveness of the sample in the current study results in an inability to generalize the findings outside of a university student population, and a resident student population in particular.

Directions for Future Research

Although the analyses provided useful information, future studies are needed to fill in the gaps that remain in the present findings. Continued research may uncover important factors in regard to mindfulness and development. For instance, there was little variation in age in the current sample; thus future studies may seek to include samples that vary based on age and perhaps year in university. This design would perhaps elucidate differences in adjustment to university between students based on developmental stage and course. Moreover, comparison of samples of students who live in residence versus off-campus in regard to coping, development, and mindfulness may further our understanding of these relationships.

While pointing to the need for continued research to strengthen our understanding of mindfulness among university students, the findings from the current study nonetheless illuminate important positive relationships between mindfulness and rational coping styles, and negative relationships with emotional and avoidant coping styles. These findings additionally bolster support for mindfulness as a state that may foster resilience against the negative impacts of stress, in particular as it relates to the transition to university. The current study is, therefore, a positive contribution to the burgeoning research that conceptualizes mindfulness as a state and practice that may lead to improved health and psychological well-being.

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