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On being aware and accepting: A one-year longitudinal study into adolescent well-being

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A B S T R A C T

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The nature and potential benefit of awareness and experiential acceptance in adolescence remains neglected and understudied. To address this gap in the literature, 776 students (50% female) in Grade 10 completed measures of mindfulness, emotional awareness, and experiential acceptance, as well as measures of major personality traits. To study prospective changes, assessments of emotional well-being were completed across a 1-year interval. Analyses revealed that “Acting with Awareness” (engaging fully in one’s current activity with undivided attention), emotional awareness, and experiential acceptance were all linked to prosocial tendencies and uniquely predicted increases in well-being across the year. Observing experience (noticing, observing, and attending to a variety of stimuli) was correlated with positive and negative aspects of personality and did not predict changes in well-being. We discuss the implications for understanding awareness and acceptance in youth.

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The last several decades have seen an explosion of scientific research on the benefits of mindfulness and acceptance for adult mental health, physical health, and social relationships (Baer, Smith, & Allen, 2004; Brown, Ryan, & Creswell, 2007; Kabat-Zin, 1990; Segal, Williams, & Teasdale, 2002). Relatively little research has been conducted with children and adolescents. The present study sought to assess the predictive and discriminant utility of emotional awareness, experiential acceptance, and two elements of adolescent mindfulness, “observing” and “acting with awareness” (Greco, Dew, & Baer, 2005). These related constructs were focused on because the adult literature suggests they are important (e.g., Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006) and because they are relatively unstudied in adolescents.

This study had several purposes. First, it evaluated the extent that mindful awareness, emotional awareness and experiential acceptance acted as an antecedent to longitudinal changes in emotional well-being, rather than mere correlates or concomitants. Second, it evaluated whether the awareness and acceptance variables are distinctive, that is, whether they predict changes in well-being over and above the other variables. Third, we examined the nomological network in which awareness and acceptance is located, focusing on the extent of correlation between these variables and personality constructs. Such examination is important in that it allows one to situate variables within a well-established personality framework and suggest how these variables relate to previously developed constructs.

Mindful awareness

Mindfulness can be defined as focusing one’s attention on present moment experience with an attitude of openness and curiosity (Bishop et al., 2004; Kashdan, 2009). Mindfulness has been shown to consist of a number of dimensions, including

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non-reactivity to inner experience, observing experiences, acting with awareness, describing/labelling with words, and non-judging of experience (Baer et al., 2004). A number of interrelated theories have been offered for why mindfulness is linked to higher well-being. First, mindfulness may undermine the dominance of unhelpful verbal networks (Fletcher & Hayes, 2005; Hayes & Plumb, 2007). In the mindful state, thoughts may be more likely to be experienced for what they are, events that come and go, rather than what they often seem to be, “things” that act as barriers to effective action. For example, a self-critical thought such as “I am useless” can be viewed as a passing event and a product of one’s brain rather than something that is a literal reflection of reality. When negative thoughts are viewed as valid reflections of reality, the thought “I am useless” leads to decrements in self-esteem and defensive, impulsive reactions such as avoidance and aggression.

Second, mindfulness may help people respond flexibly to changing environmental opportunities and demands (Brown et al., 2007; Miller, Wyman, Huppert, Glassman, & Rathus, 2000). Mindful adolescents are less likely to be caught up with thoughts about the past (rumination) or future (worry). Rather, they are expected to be better at noticing appetitive and aversive external stimuli and to regulate their behaviour in order to maximize reinforcement.

A number of intervention studies have examined the benefits of mindfulness training among adolescents (Biegel, Brown, Shapiro, & Schubert, 2009; Burke, 2009; Miller et al., 2000; Singh et al., 2007). For example, Biegel et al. (2009) assessed the effectiveness of mindfulness-based stress reduction in a randomized-control design amongst adolescents (aged 14–19) and found that the program significantly improved mental health and self-esteem. In another study, Miller and colleagues examined the impact of Dialectical Behavior Therapy (DBT) in adolescents (aged 14–19; Miller et al., 2000). The DBT intervention was shown to reduce symptoms such as confusion about the self and interpersonal problems. Of the nineteen skills taught in the intervention, three of the four most highly rated skills involved mindfulness (“do what works”, “observe”, and “stay focused”).

These studies provide indirect evidence that mindfulness is an antecedent to well-being in adolescence, a key hypothesis in the present paper. The evidence is only “indirect” because the interventions did not directly assess changes in mindfulness as a result of the intervention.

It is important to note that research into the active components of mindfulness in both child and adult populations is still ongoing. Different researchers from different backgrounds suggest different components, but neither theory nor data have yet concluded which are necessary or sufficient components (Baer et al., 2006, 2004). For example, some measures assess four dimensions of mindfulness (Baer et al., 2004), whereas others assess only one (Brown & Ryan, 2003). We examined two core components in the present study, acting with awareness and observing experience. We focused on these constructs because they seemed most likely to complement and be distinguishable from our other constructs, namely, emotional awareness and experiential acceptance.

Emotional awareness

Two adolescent constructs are particularly relevant to mindfulness, namely, emotional awareness and experiential acceptance. Emotional awareness refers to an adolescent’s awareness of feelings and the ability to label those feelings (Ciarrochi, Heaven, & Supavadeeprasit, 2008). This construct tends to correlate with mindfulness and indeed has been listed as a dimension of mindfulness in the adult literature (Baer et al., 2006, 2004). Past research suggests that emotional awareness skill can be reliably measured in adolescents and acts as an antecedent to increasing emotional and social well-being (Ciarrochi et al., 2008).

Adolescents are expected to be less able than adults to use words to describe their feelings. Penza-Clyve and Zeman (2002) suggest that adolescents low in emotional awareness may not know precisely what they are feeling, but do know that they are experiencing general emotional distress. Research in our lab suggests that most 10-year-old children (5 years younger than the present sample) are aware of basic affective states and can label them (Bajgar, Ciarrochi, Lane, & Deane, 2005). Lane and Schwartz (1987) and Saarni’s (2000) theories suggest that there are more advanced levels of emotional awareness that include identification of multiple, conflicting emotions, identification of emotional blends, identification of emotions about emotions, and identification of conflicting emotions in the self and other. Like Penza-Clyve and Zeman (2002), we would hypothesize that adolescents low in emotional awareness are generally able to identify their affective states in simple terms, but are not able to perform the more sophisticated emotional awareness tasks.

Experiential acceptance

Low experiential acceptance (also termed psychological inflexibility) is defined as the inability to be in contact with the present moment fully as a conscious human being and to change or persist in behaviour when doing so serves valued ends (Greco, Lambert, & Baer, 2008b; Hayes, Strosahl, & Wilson, 1999). As this definition indicates, mindfulness is considered to be a key part of psychological flexibility. However, it is important to note that experiential acceptance and mindfulness come from different traditions, with the experiential acceptance measure developed specifically for evaluating Acceptance and Commitment Therapy (Hayes et al., 2003).

Given the different traditions, it is likely that experiential acceptance and mindfulness will overlap, but not be redundant. For example, experiential acceptance refers to mindfulness dimensions related to non-reactivity to inner experience (my thoughts and feelings mess up my life) and non-judging of experience (if my heart beats fast, there must be something wrong with me). However, it also refers to items explicitly linked to goal-related activity, which are typically not present in

mindfulness measures (e.g., “I stop doing things that are important to me whenever I feel bad”). Past research with young people suggests that experiential acceptance is associated with lower anxiety, somatic complaints, and problem behaviour, and is associated with higher quality of life (Greco, Lambert, & Baer, 2008). However, no research has been published that looks at the ability of experiential acceptance to predict future changes in well-being.

The present study

This study sought to evaluate the extent that mindful awareness, emotional awareness, and experiential acceptance acted as distinct antecedents to changes in emotional well-being over the course of one-year. People high in awareness and acceptance were expected to show improvements in well-being compared with those low in these variables.

We also sought to examine the nomological network of adolescent mindfulness by correlating it with measures of personality. Based on past adult research (Baer et al., 2006, 2004; Masicampo & Baumeister, 2007), we expected mindfulness to be associated with personality constructs related to self-control such as conscientiousness and low psychoticism, to be associated with openness to experience, and to be associated with lower neuroticism (or negative affectivity).

Method

Participants

Participants were students who attended five Catholic high schools in New South Wales, Australia. The school districts include the city of Wollongong (population about 250,000) as well as south-western Sydney thereby ensuring a diverse socio-economic sample. Students were surveyed in the middle of Grades 10 and 11. A total of 776 students (male = 388, female = 386; 2 unreported; mean age = 15.4, SD = .53) completed the first wave of data and 572 (male = 269, female = 301; 2 missing; mean age = 16.18, SD = .46) students completed the second wave. Attrition was due to conflicting school activities (e.g., photos), school absences, changing schools and leaving the school for the workforce or technical training at the end of Grade 10. The ratio of males to females changed slightly from Grade 10 to 11 because, we suspect, more males than females left school in Grade 11 to pursue technical training.

Missing value analysis revealed that mean levels were similar among completers and non-completers across most variables. There were a few differences, with full completers being more agreeable ($M = 3.8$), more open ($M = 3.5$), and lower on Eysenck's measure of psychoticism ($M = .20$) than those who completed only the first wave ($M = 3.6, 3.3, \text{ and } .27$, respectively). There are a number of ways to deal with missing data, but expectation/maximization (EM) procedures appear to yield the least biased estimates (Allison, 2002; Howell, 2008). We utilized EM imputation to replace missing values.

All variables were significantly skewed (skew statistic $> .20$, SE = .088), except for neuroticism, agreeableness, and the two mindfulness subscales described below. Thus, analyses were conducted using both parametric and nonparametric statistics. Correlational analyses involved Pearson correlations and Spearman (nonparametric) correlations. All regression analyses involved standard parametric procedures as well as nonparametric bootstrapping analyses (using 10,000 bootstraps and the percentile method; (Mooney & Duval, 1993). We report parametric analysis results for ease of interpretation, but we do not declare an effect to be significant unless it was significant in both parametric and nonparametric analyses.

Materials

Mindfulness

The twenty items taken from the Child and Adolescent Mindfulness Measure (CAMM-20) was derived from the adult Kentucky Inventory of Mindfulness Skills (Baer et al., 2004; Greco et al., 2005; Greco, Smith, & Baer, 2009). We chose 20 items of the CAMM that assessed observing and acting with awareness. We excluded 5-items that focused on accepting without judgment, because our questionnaire already contained a validated adolescent measure of experiential acceptance (see below). We refer to the 20-item CAMM as the CAMM-20.

The items on this measure focus on the extent that adolescents are aware of internal stimuli (“I pay attention to my muscles and notice when they feel tight or relaxed”) external stimuli (“When I take a shower or bath, I notice how the water feels on my body”), and mindful behaviour (“At school, I walk from class to class without noticing what I am doing”). The items for the CAMM-20 are presented in Table 1.

Emotional well-being

We used the Positive and Negative Affect Schedule—Expanded Form (PANAS-X; Watson & Clark, 1994) to assess fear (e.g. “afraid”, “scared”; six items), sadness (e.g. “sad”, “blue”; five items), hostility (“angry”, “hostile”, “irritable”), and joviality (e.g. “joyful”, “delighted”; eight items). We refer to “joviality” as “positive affect”, as we believe this better captures the breadth of the scale. Respondents rated the extent to which they had experienced each particular emotion over the past month. Ratings were made on a five-point scale (very slightly or not at all (1) to extremely (5)). Research has shown the subscales to have adequate internal consistency, discriminant validity, and criterion-related validity (Watson & Clark, 1994).

The reliabilities for the subscales were all adequate in the present sample: Fear ($\alpha_{10} = .88$; $\alpha_{11} = .88$); Sadness ($\alpha_{10} = .93$; $\alpha_{11} = .93$); Hostility ($\alpha_{10} = .84$; $\alpha_{11} = .85$); Positive affect ($\alpha_{10} = .95$; $\alpha_{11} = .95$). We could not sample every affective state, but

Table 1

Factor loadings (Pattern matrix) for the child mindfulness scale, broken down by males and females.

Item	Observe		ACT without Aware	
	M	F	M	F
8. I notice my thoughts as they come and go	.76	.75	.04	.11
13. I pay close attention to whatever is happening right now	.67	.60	-.16	.02
5. I pay close attention to my thoughts	.61	.65	-.04	.05
12. I notice when my feelings begin to change	.60	.69	.14	.23
7. When I take a shower or bath, I notice how the water feels on my body	.59	.62	.09	.22
9. When I'm eating, I notice the way it feels to chew my food	.56	.56	.08	.19
2. I pay attention to my muscles and notice when they feel tight or relaxed	.52	.62	.12	.14
14. I notice how things around me smell	.53	.59	.02	.16
1. I notice small changes in my body, like when my breathing slows down or speeds up	.49	.62	.10	.12
6. When I'm doing something, I focus only on what I'm doing and nothing else	.45	.42	.00	-.03
16. When I'm reading, I focus all my attention on what I'm reading	.40	.40	-.17	-.16
17. I do many things at once	.35	.15	.01	.26
20. I find myself doing things without paying attention	-.02	.05	.72	.82
15. When I do things, my mind wanders off and I'm easily distracted	-.05	.03	.69	.66
4. I do things without thinking about what I'm doing	-.07	-.06	.65	.64
3. At school, I walk from class to class without noticing what I'm doing	-.03	.00	.59	.64
18. I rush through activities without being really attentive to them	-.03	.06	.55	.58
10. It's hard for me to pay attention to only one thing at a time	.08	.14	.55	.55
19. I do jobs or tasks automatically, without being aware of what I'm doing	.16	.18	.54	.58
11. I think about things that have happened in the past instead of thinking about things that are happening right now	.12	.24	.52	.56

Note: M = male; F = female.

fear, sadness, hostility and positive affect captures a broad range of important states. Fear and sadness are related to two of the most common emotional disorders (i.e., anxiety and depression; (Kessler et al., 1994; Watson & Clark, 1994). There tend to be fewer dimensions of positive states (Watson & Clark, 1994), and the scale used in the present study captures a broad range of discrete positive emotions.

Psychoticism

The Psychoticism (P) scale (Eysenck & Eysenck, 1975) is considered to be one of the best markers of Impulsive Sensation Seeking (Zuckerman, 1993). We used Corulla's (1990) 12-item revision of Eysenck's original Psychoticism scale for youth ($\alpha = .71$). Example items include: "Would you enjoy practical jokes that could sometimes hurt people?", "Do you seem to get into a lot of fights," and "Should people always try not to be rude?" Those who score higher on P are more likely to engage in disinhibited behaviours, such as aggression and substance abuse (Heaven, 1996; Zuckerman, 1993, 2007).

The Big Five was measured in Grade 10 using the ten-item International Personality Item Pool scales (Goldberg, 1990; Goldberg, 1992; Goldberg et al., 2006; Gow, Whiteman, Pattie, & Deary, 2005). The IPIP assesses neuroticism (N; $\alpha = .79$), extraversion (E; $\alpha = .82$), openness/intellect (O; $\alpha = .76$), agreeableness (A; $\alpha = .76$), and conscientiousness (C; $\alpha = .76$). Participants rated the extent that each statement was accurate in describing themselves, ranging from (1) "Very Inaccurate" to (5) "Very Accurate." These scales have been shown to have adequate internal validity, to fall onto the expected five-factor structure across multiple samples, and to correlate highly with the appropriate scales of the NEO (Costa & McCrae, 1992) and the EPQ (Eysenck & Eysenck, 1975), demonstrating concurrent validity (Gow et al., 2005).

Emotional awareness were measured using twelve items from the Toronto Alexithymia Scale (Bagby, Parker, & Taylor, 1994) that focus on skill (or lack thereof) at identifying and describing feelings. Items are rated on a five-point scale, ranging from strongly disagree (1) to strongly agree (5). Example items include "I am often confused about what emotion I am feeling," and "I am often puzzled by the sensations in my body." The identifying and describing subscales combined to form a single scale because of their high intercorrelation and because past research suggests that they fall into the same psychometric space (Gohm & Clore, 2000). The scale was reverse-scored so that higher scores indicate higher emotion awareness.

The scale has been shown to be internally consistent in Grades 8 and 9 (Ciarrochi et al., 2008), and was internally consistent in the present sample ($\alpha = .85$). Ciarrochi et al. (2008) showed that the scale predicts increases in emotional well-being (e.g., positive affect) and social well-being (e.g., social support). A number of other studies have found that self-reported emotional awareness can be reliably measured in both children and adolescents and relates in expected ways to happiness, negative affect, maladaptive coping, and internalizing symptoms (Extremera, Duran, & Rey, 2007; Penza-Clyve & Zeman, 2002; Rieffe, Oosterveld, & Terwogt, 2006; Sim & Zeman, 2004; Zeman, Shipman, & Suveg, 2002).

Psychological flexibility, or experiential acceptance refers to an individual's ability to connect fully with the present moment as a conscious human being, and to change or persist in behaviour that is in line with their identified values (Hayes et al., 1999). The 17-item Avoidance and Fusion Questionnaire is considered to be a marker of psychological inflexibility (Greco et al., 2008). However, because its items focus mostly on the acceptance component of psychological flexibility (Ciarrochi, Bilich, & Godsel, 2010), we refer to it as experiential acceptance. Participants are asked to rate how true each statement is for the individual, ranging from 0 (not at all true) to 4 (very true). Example items include "I must get rid of my worries and fears so I can have a good life" and "I push away thoughts and feelings that I don't like." The scale was highly reliable in our

sample ($\alpha = .89$). Greco et al. (2008) have shown the scale to be internally consistent and to be related in expected ways to child reports of anxiety, somatisation, and quality of life. The scale has also been related to teacher ratings of behavioural problems and academic competence.

Results

Preliminary analysis of the mindfulness measure

We first conducted exploratory factor analysis (EFA) in order to identify whether the CAMM-20 could be treated as a single factor or not. EFA was conducted separately for boys and girls, which allowed us to examine the extent the observed factor structure was replicated in two samples.

The 20 items of the CMS were subjected to principal axis factoring (PAF) followed by an oblimin rotation. We used multiple criteria to determine the number of factors, including eigen value greater than 1, examination of scree plots, and interpretability of the solutions (Conway & Huffcutt, 2003; Fabrigar, Wegener, MacCallum, & Strahan, 1999).

Our analyses revealed five components with eigen values greater than 1 for both boys (5.05, 3.08, 1.38, 1.2, 1.03) and girls (5.00, 3.62, 1.4, 1.2, 1.01). Examination of the scree plots suggested two strong factors, with the remaining factors being approximately 1 or below. The two factors explained 40% of the variance amongst males and 43% of the variance amongst females. These two factors also provided a highly interpretable solution.

As can be seen in Table 1, the interpretation of the two components might be described as “Observing” (Ob) and “Acting with Awareness (AWA)”. The first factor is associated with items that involve noticing, observing, and attending to a variety of stimuli, including internal phenomena such as bodily sensations and external phenomena such as smells. The second factor is associated with items that involve engaging fully with one’s current activity with undivided attention, or focusing one’s awareness on one thing at a time. The factor structure was similar for boys and girls.

Items “6”, “16”, and “17” had commonalities of .20, .17, and .08, respectively, and thus did not appear to be well explained by the two factor solution. In addition, items “6” and “16” loaded relatively weakly on Ob but appeared to reflect content that better belonged on the AWA factor. Item “17” cross-loaded weakly on both factors. These three items were not included in further analyses. The remaining items had commonalities ranging from .31 (item 1) to .59 (item 8) and loaded clearly on the expected factor with weak cross-factor loadings.

We conducted further multiple group analysis to determine if the boys and girls differed in factor loadings. We found that fit indexes for the analysis that assumed girls and boys had the same factor structure ($\chi^2/df = 4.13$; NFI = .78; RMSEA = .07) were virtually identical to the analysis assuming the factor structure was different ($\chi^2/df = 4.33$; NFI = .78, rmsea = .07), so we assumed no difference and examined effects across gender.

We formed two new subscales based on the factor analysis. The Ob scale consisted of 9 items with an internal (alpha) consistency of .85, whereas AWA consisted of 8 items with an internal consistency of .83. The two subscales correlated modestly, $r = -.20$, $p < .001$, with higher Ob unexpectedly being associated with lower AWA.

Cross-sectional analyses

The means and standard deviations for the key individual difference variables are presented at the bottom of Table 2. Concerning the measures of sadness, fear, hostility, and positive affect, Bonferroni corrected t-tests ($\alpha = .0125$) revealed no significant differences between Time 1 and Time 2 for fear ($M_{t1} = 1.84$; $M_{t2} = 1.88$), hostility ($M_{t1} = 1.97$; $M_{t2} = 1.95$), or sadness ($M_{t1} = 2.01$; $M_{t2} = 1.95$). There was a significant difference for positive affect ($M_{t1} = 3.93$; $M_{t2} = 4.03$), $p < .01$, indicative of greater positive affect in Grade 11 compared with Grade 10.

Table 2

Correlations involving mindfulness, emotional awareness, experiential acceptance, and personality.

	1	2	3	4	5	6	7	8	9	10
<i>Mindfulness</i>										
1. Observing	.85	-.20*	-.20**	-.31**	.15**	-.03	.34**	.22**	.24**	-.05
2. Act with Awareness		.83	.51**	.49**	-.48**	.04	.04	.01	.40**	-.24**
3. Emotion awareness			.89	.51**	-.57**	.08*	.08*	.09**	.30**	-.18**
4. Experience acceptance				.89	-.50**	.05	.05	.08*	.17**	-.17**
<i>Personality</i>										
5. Neuroticism					.79	-.09*	-.09*	-.05	-.026**	.10**
6. Extraversion						.82	.23**	.28**	.04	.07*
7. Openness							.76	.41**	.32**	-.13**
8. Agreeableness								.76	.24**	-.41**
9. Conscientiousness									.74	-.32**
10. Psychoticism										.71
<i>M (SD)</i>	1.8 (.8)	2.15 (.8)	3.7 (.8)	2.9 (.7)	2.7 (.8)	3.5 (.7)	3.4 (.6)	3.7 (.6)	3.1 (.6)	.22 (.2)

Notes. * $p < .05$, ** $p < .01$; significant in both parametric (Pearson) and nonparametric (Spearman) analyses. Diagonals represent alpha coefficients.

Table 3

Correlations between mindfulness, emotion awareness, experience acceptance, and emotional well-being measured in Grade 10 and Grade 11.

	Grade 10			
	Observing	Act with Awareness	Emotion Awareness	Experience Acceptance
Grade 10				
Fear	.15**	-.37**	-.49**	-.41**
Hostility	.16**	-.37**	-.44**	-.39**
Sadness	.11**	-.40**	-.53**	-.46**
Positive affect	-.02	.17**	.30**	.31**
Grade 11				
Fear	.10**	-.35**	-.45**	-.38**
Hostility	.06	-.39**	-.42**	-.35**
Sadness	.13**	-.40**	-.48**	-.42**
Positive affect	-.02	.24**	.31**	.35**

** $p < .01$; significant in both parametric (Pearson) and nonparametric (Spearman) analyses.

We next examined the link between mindfulness, awareness, acceptance, and personality. As can be seen in Table 2, AWA, emotional awareness, and experiential acceptance all tended to be moderately and positively interrelated, whereas observing was weakly and negatively related to these variables. Ob was associated with both positive and negative aspects of personality, including higher openness, agreeableness, conscientiousness, and neuroticism. In contrast, AWA, emotional awareness, and experiential acceptance were associated with lower neuroticism. They were also associated with lower psychoticism.

We next examined how the awareness and acceptance measures were associated with emotional well-being. As can be seen in Table 3, Ob was weakly associated with higher fear and sadness at Time 2. In contrast, AWA, emotional awareness, and experiential acceptance had a moderate concurrent relationship with well-being and predicted all aspects of affect after a 1-year interval.

Awareness, acceptance, and prospective changes in emotional well-being

We expected adolescents with greater awareness and acceptance to show greater improvement in well-being (less negative emotions, more positive emotions). To test this hypothesis, we constructed a hierarchical regression model to examine whether Time 1 (T1) awareness and acceptance predicted Time 2 emotional well-being, when controlling for T1 well-being. In step 1 of the analysis, we entered Time 1 sadness, hostility, fear, and positive affect into the model to predict the Time 2 measure of these affective variables. Step 2 of the analyses involved adding awareness and acceptance variables to the model, to determine if these variables predicted variance over and above baseline affect and each other. This kind of analysis allows one to examine if someone high on awareness and acceptance is likely to experience increasing positive and decreasing negative affect, relative to someone low in awareness and acceptance with the same baseline (Time 1) level of affect.

Observing failed to predict change in emotional well-being, and consequently is not discussed further in this results section. As can be seen in Table 4 Step 1, there was moderate stability in affective state, with 34%–44% of the variance in Time 2 affect being predicted by Time 1 affect. Step 2 suggested that the awareness and acceptance variables uniquely predicted changes (relative to baseline) in affective states. AWA predicted decreasing sadness and hostility, emotional awareness predicted decreasing sadness, hostility, and fear, and experiential acceptance predicted increasing positive affect, as well as decreasing sadness and fear.

The coefficients in Step 2 would be considered in the small range, but this may be in part because they represent only unique variance of the constructs after controlling for the other three variables and for baseline affect. Another way to look at the effect size of each variable is to examine their predictive power whilst controlling only for baseline affect (and not the other variables). This analysis revealed that the awareness and acceptance variables individually explained between 2% and 5% of the variance in changes in well-being. Specifically, AWA explained 3.2%, 4%, 4.8%, and 2.9% of the variance in future fear,

Table 4

Hierarchical regression analysis summary for Grade 10 variables predicting Grade 11 positive affect (pos), sadness, hostility, and fear.

	Pos. affect		Sadness		Hostility		Fear	
	β	R^2	B	R^2	B	R^2	β	R^2
Step 1		.42		.44		.34		.34
Baseline affect	.65**		.66**		.58**		.58**	
Step 2		.45		.48		.38		.39
Baseline affect	.61**		.53**		.46**		.45**	
Emotion awareness	.05		-.11**		-.12**		-.16**	
Experience acceptance	.12**		-.07*		-.05		-.09*	
Act with awareness	.05		-.09**		-.14**		-.06	

* $p < .05$; ** $p < .01$; significance level occurred in both parametric analyses and nonparametric bootstrapping analyses.

sadness, hostility, and joviality, whereas experiential acceptance explained 3.6%, 3.2%, 2.9%, and 4.4%, and emotional awareness explained 5.8%, 4%, 4.8%, and 2.6%.

Discussion

To address the paucity of adolescent research on awareness and acceptance, the present study focused on measurement issues, the nomological network, and how acceptance and awareness in adolescents predicts changes in well-being over the course of a 1-year interval.

As for the measurement of mindfulness in youth, the present study suggests that the CAMM-20 can be split into two reliable subfactors, Observing (Ob) and Acting with Awareness (AWA). The Ob items focus on noticing and attending to a variety of internal and external stimuli, whereas the AWA items focus on whether one engages fully in one's current activity with undivided attention. This factor structure is similar to the work of other researchers who focused on adults with the Adult Kentucky Inventory of Mindfulness Skills (KIMS) and which provided the origin of the CAMM items (Baer et al., 2004). The AWA subscale showed the most promise by correlating in expected ways with theoretically relevant constructs, and predicting the development and maintenance of well-being over a 1-year interval.

Before discussing the implications of these findings, it is important to note some limitations. Mindfulness is a multifaceted construct (Baer et al., 2006, 2004) that probably was not fully captured by the Ob and AWA dimensions of the CAMM-20. For example, the CAMM-20 did not include items assessing the non-judging of experience (e.g., the belief that some thoughts or feelings are bad). However, this mindfulness dimension seems related to our measure of experiential acceptance, which includes statements such as "My thoughts and feelings mess up my life" and "feeling scared or sad is bad." Similarly, the CAMM-20 does not include a measure of the mindfulness dimension that involves labelling private experiences, but the emotional awareness questionnaire included in this study involves assessing young people's skill at labelling feelings. Future research is needed to examine the extent that the acceptance and labelling component of mindfulness correlate with adolescent measures of emotional awareness and experiential acceptance.

Awareness and acceptance are complex constructs that might not be fully captured by self-report (Roemer et al., 2009). Indeed, if someone lacks awareness, then it is also possible that they may be unaware of being unaware. Nevertheless, the present findings suggest that Acting with Awareness, emotional awareness, and experiential acceptance are distinct from each other and from measures of negative affect. Thus, making negative self-evaluations on the awareness and acceptance scales is not exclusively a reflection of global negative evaluations concerning one's skill. Future research is needed to develop more behaviourally-based measures of awareness and acceptance, in both adolescents and adults.

Despite the limitations of this study, it does provide support for the importance of awareness and acceptance in the development of well-being in adolescence. The cross-sectional component of our study suggests that awareness and acceptance are correlated with all dimensions of well-being, and with the general tendency to experience fewer negative states (or neuroticism). The longitudinal component allowed us to assess whether awareness and acceptance were mere correlates (epiphenomenon) or consequence of well-being, or whether they temporally preceded well-being. Consistent with our hypotheses, awareness and acceptance preceded decreases in sadness, fear, and hostility, and increases in positive affect. This finding suggests that awareness and acceptance play a causal role in well-being. However, as with any longitudinal study, there is always the possibility that unmeasured variables explain the longitudinal link between AWA and well-being.

Perhaps the best way to deal with the unmeasured variable problem is to use an experimental design. Future research should seek to increase AWA, emotional awareness, and experiential acceptance individually and observe the influence of changes in these variables on future outcomes. Initial research suggests that mindfulness interventions do indeed improve well-being in young people (Biegel et al., 2009; Lee, Semple, Rosa, & Miller, 2008; Miller et al., 2000; Singh et al., 2007), but the mechanisms by which these interventions work is unknown. For example, the interventions could work by increasing emotional awareness, awareness of actions, and/or experiential acceptance. The measures examined in the present study can be used to assess distinctive processes of change.

The longitudinal correlation between the awareness and acceptance variables and well-being would be considered to be in the moderate to large range for all variables except for observing (Table 3; Hemphill, 2003). In contrast, the longitudinal effects in predicting *changes* in emotional well-being one-year later were more modest (approximately 2–5% variance explained). The awareness and acceptance variables as a group predicted 3–5% of the variance over and above baseline affect (or a multiple *R* of approximately .17–.22), which compares well with other published longitudinal effect sizes (Ciarrochi & Heaven, 2008; Ciarrochi, Leeson, & Heaven, 2009; Nolen-Hoeksema, Larson, & Grayson, 1999).

As expected, we found that AWA, emotional awareness, and experiential acceptance were all moderately correlated. The correlations were not so high as to suggest redundancy, and indeed regression analysis suggested that each of these variables predicts unique variance in well-being, over and above the other variables. Awareness and acceptance were also associated with two prosocial traits, conscientiousness and low psychoticism. This suggests that adolescents who engage in antisocial behaviours may do so in part because they are not aware of their own behaviours and feelings and associated negative consequences.

Consistent with this view, Heppner et al. (2008) found that adult dispositional mindfulness was correlated with lower self-reported aggressiveness and hostile attribution style. In a second study, Heppner et al. (2008) found that experimentally manipulating mindfulness resulted in less-aggressive behaviour following a salient social rejection. In a small pilot study

involving adolescents, Singh et al. (2007) found that mindfulness reduced aggressive behaviour. Mindful awareness of actions is likely to promote self-control, in which actions are driven by values and their fit with the current situation (Brown et al., 2007; Masicampo & Baumeister, 2007), rather than by transitory feelings or impulses.

In contrast to the AWA, emotional awareness, and experiential acceptance, we found that the mindful observing scale correlated with both positive and negative aspects of personality and well-being. It correlated with high openness to experience, but also with high neuroticism and high fear and sadness. Similarly, Baer found that the adult observing scale correlated with high openness and high mental health problems (Baer et al., 2006). However, in contrast to the studies by Baer, we found that the observe factor was correlated with lower experiential acceptance and emotional awareness, and higher levels of agreeableness and conscientiousness.

Thus, the adolescent version of the observing scale seems to be more negative and more prosocial than the adult scale. This is consistent with Baer's notion that people high in observe are not necessarily low in critical judgment and evaluation (Baer, 2003; Baer et al., 2006). Our adolescents appeared to experience higher fear and sadness, perhaps because of aversive social or self-evaluations. Baer et al. (2006) have suggested that the observing factor may be sensitive to changes in mindfulness experience. Thus, if adolescents were taught mindfulness, they may learn to observe without evaluation, and their skill at observing may no longer be linked to negative emotional experience or psychological inflexibility. Future research is needed to evaluate this possibility.

In summary, the AWA, emotional awareness, and experiential acceptance scales appear to map on to distinctive processes and predict the development of adolescent well-being. The scales can be used to evaluate mindfulness-based interventions in adolescents, or to identify adolescents at risk for social and emotional problems. The study of awareness and acceptance in adolescence is still in the earliest stages, but the present study, along with early intervention research (Biegel et al., 2009; Miller et al., 2000; Singh et al., 2007; Wicksell, Melin, Lekander, & Olsson, 2009), suggests that awareness and acceptance may be critical mechanisms in promoting adolescent well-being.

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