J Child Fam Stud (2014) 23:1298–1309
DOI 10.1007/s10826-013-9830-2

ORIGINAL PAPER

Mindfulness and Self-Compassion: Exploring Pathways to Adolescent Emotional Well-Being

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Published online: 19 September 2013

Abstract Adolescents today are confronted with the compounded stressors of life in our high-pressured society and the cognitive, physiological, and emotional changes characteristic of this stage of development. To explore ways to promote well-being in this population, mindfulness, defined as paying attention in the moment in an intentional and purposeful way, was examined in terms of its associations with aspects of emotional well being. It has been reported to have positive effects on emotional well-being in adults, and shows promise for similar results in research with youth. Moreover, the mechanisms through which being mindful may influence positive outcomes have only recently been explored, and have not been investigated with adolescents. Self-compassion, defined by the three components of self-kindness, sensing oneself as part of a common humanity, and maintaining perspective in challenging circumstances, was examined as a potential mediator of the relationship of mindfulness to various outcome measures. Measures assessing mindfulness, self-compassion, and aspects of emotional well-being comprised an online survey that was administered to 67 adolescents in an urban high school. Path analysis was utilized to explore relationships among the variables. An alternate model with self-compassion as the predictor and mindfulness as the mediator was also investigated. Results suggested that both mindfulness and self-compassion functioned as mediators in the pathway to emotional well-being. A theorized model is presented which depicts a reciprocal relationship between mindfulness and self-compassion and describes an iterative process that takes place between these two constructs, promoting emotional well-being. Implications for research and practice include conducting longitudinal studies, which assess constructs at three time points to definitively establish mediation, and developing a self-compassion program tailored for adolescents to facilitate improvements in emotional well-being.

Keywords Mindfulness · Self-compassion · Emotional well-being · Stress · Adolescence

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Introduction

Stress has become an integral and accepted part of daily life in our culture. Whether as a result of our busy lives or the influence and expectations presented by the media, our children also are beginning to show signs of stress. Bailey (2011) explained that the pressures accumulating from school, peer interactions, and day-to-day family living can take a toll on children. Adolescents are exposed to the same stressors of school, activities, and family life, as are their younger counterparts. However, they are also subject to the rapid cognitive, physiological, and psychosocial changes that are characteristic of this stage of development.

Mindfulness, a 2,500 years old practice recently introduced in the West, has been associated with reduced stress in adults (see Greeson 2009). Rooted in Eastern contemplative traditions, mindfulness is a state of consciousness in which one brings awareness and attentiveness to her

immediate experience (Grossman 2010). Recognizing that mindfulness is both an outcome, as when one refers to mindful awareness, and a process, as that which occurs when one engages in mindfulness practice, one definition which encompasses this construct is, "The awareness that arises through intentionally attending in an open, accepting, and discerning way to whatever is arising in the present moment" (cf. Shapiro 2009, p. 556).

It is important to clarify the difference between mindfulness as an outcome, which will be referred to herein as mindfulness, and mindfulness as a process, referred to herein as mindfulness practice. Mindfulness is described as a state or trait in which an individual becomes increasingly aware and attentive in the moment. It may include specific qualities such as acceptance or the ability to describe an inner experience in the moment that it is taking place. Mindfulness practice, on the other hand, refers to a daily time dedicated to practicing techniques which encourage mindfulness. These techniques include breath awareness, mindful movement (gentle yoga), and a body awareness practice referred to as a body scan. Additionally, a third term, mindfulness intervention, refers to a program or series of classes in which one is taught mindfulness practice techniques and encouraged to develop a daily practice. The most empirically evaluated mindfulness intervention is Mindfulness-Based Stress Reduction (MBSR) (Kabat-Zinn 1982, 1990).

There has been debate about conceptual clarity among definitions of mindfulness in scholarly work. Through much debate and discussion, a two component model of mindfulness has been presented consisting of (a) self-regulation of attention, described as bringing awareness to the focus of attention so that one is able to attend fully to the continually changing field of thoughts, feelings, and sensations, and (b) orientation to experience, which refers to the attitude or approach one takes in attending to the present moment (Bishop et al. 2004). Mindfulness practice encourages an approach of openness, curiosity and acceptance. When practicing this approach with regularity, it is believed that one becomes less likely to avoid or suppress certain emotions, since they are perceived as less threatening. Self-criticism wanes since that which one experiences in the moment is no longer loaded with emotional meaning and self-judgment, but is accepted as an integral part of the condition of being human (Salzberg 2011). In other words, instead of our thought processes being constantly engaged with trying to make things better and judging ourselves for not meeting our own expectations of ourselves, we "let go" of trying to make things different than they are, and accept that which is. In this process, we exercise a compassionate stance towards ourselves, and with regular practice, this stance eventually becomes integrated in our ongoing relationship with ourselves.

Over the last 30 years, empirical studies have offered ample evidence for the positive physiological and psychological effects of mindfulness for adults (Baer 2003; Greeson 2009; Grossman et al. 2004; Keng et al. 2011). These effects have included improvement in chronic pain (Kabat-Zinn et al. 1985, 1987; Morone et al. 2008; Pradhan et al. 2007; Zautra et al. 2008) and overall immune function (Bartsch et al. 1992; Massion et al. 1995). Additionally, anxiety (e.g., Kabat-Zinn et al. 1992; Miller et al. 1995) depression (e.g., Fincune and Mercer 2006; Kutz et al. 1985; Teasdale 2004), mood disturbance (Carlson et al. 2001), social phobia (Boguls et al. 2006) and stress-level (e.g., Speca et al. 2000) were significantly lower post-treatment in clinical and non-clinical samples and in several studies these positive outcomes were maintained at follow-up.

Empirical research on adolescents is minimal, however, (Burke 2010; Twohig et al. 2010) and most of these efforts have been conducted in intervention studies. These intervention studies reported lower negative affect and greater positive affect in both high school students (Broderick and Metz 2009; Ciarrochi et al. 2010) and 4th through 7th grade students (Schonert-Reichl and Lawlor 2010), an increase in overall well-being for 14 and 15 years-old boys in an independent British school (Huppert and Johnson 2010), a decrease in perceived stress among clinic-referred 14–18 years olds (Biegel et al. 2009), and a decrease in psychological distress in 14–17 years olds who had been diagnosed with a mental health disorder (Tan and Martin 2013). Recently, a qualitative study reported greater calm and balance, control and self-efficacy in non-clinical 16–24 years olds and participants claimed a greater understanding of both themselves and others (Monshat et al. 2013).

Results of correlational studies reflect findings similar to those of intervention studies, as well as to those of both correlational and interventional studies with adults. For example, in the validation of the Mindfulness Attention Awareness Scale for adolescents (MAAS-A), findings indicated that higher MAAS-A scores indicating higher levels of mindfulness were positively associated with greater life satisfaction, happiness, positive affect, self-regulation, and wellness, and negatively associated with negative affect and a tendency to use substances as a coping mechanism among 14–18 years olds from eight Midwestern public schools (Brown et al. 2011). Similarly, mindfulness was positively associated with overall quality of life and negatively associated with internalizing and externalizing problem behaviors in a sample of 5th through 10th grade students (Greco et al. 2011). In a sample of Australian tenth graders from diverse socioeconomic backgrounds, awareness and acceptance, two key components of mindfulness, were associated with lower reported

levels of fear, hostility, and sadness, and positively associated with positive affect (Ciarrochi et al. 2010). The results of these correlational analyses indicated strong support for the positive associations between mindfulness and dimensions of emotional well-being among adolescents. The next section explores self-compassion as a potential mechanism, or mediator, which was hypothesized to elucidate the link between mindfulness and dimensions of emotional well-being.

Self-compassion, as defined by Neff (2003a), is a construct that encompasses three main components: self-kindness, a recognition that we are part of a common humanity, and a capacity for holding one's emotional experience in balanced awareness (mindfulness). Self-compassion is not to be confused with self-esteem, which involves a comparison of one's abilities with those of others, resulting in an evaluation or judgment about where one stands in the social hierarchy (Neff and Vonk 2008). In contrast, self-compassion involves a linking or fundamental connection with others through an understanding of our common humanity (Neff 2003b).

Self-compassion research is burgeoning, and findings have revealed associations with positive well-being in a number of recent studies. A meta-analysis of 14 self-compassion studies conducted with healthy adults (student and community samples) reported a large effect size indicating a negative association between psychopathology (defined by aggregating anxiety, depression, and stress) and self-compassion (Macbeth and Gumley 2012). Other research findings with adults have indicated positive correlations with life-satisfaction, happiness, optimism, positive affect, spirituality, emotional intelligence, coping skills, self-improvement motivation and overall psychological well-being in both community samples and university students (Baer et al. 2012; Bishop et al. 2004; Breines and Chen 2012; Heffernan et al. 2010; Leary et al. 2007; Neely et al. 2009; Neff and Vonk 2008; Neff 2003a; Neff et al. 2005, 2007).

Finally, if mindfulness interventions promote increased self-compassion, then one would expect individuals who have a history of mindfulness practice to be more self-compassionate. In two studies comparing long-term practitioners to those who were novices to mindfulness practice, this outcome was found to be the case (Lykins and Baer 2009; Neff 2003a).

Self-compassion may be a particularly salient construct for helping us to understand adolescents because of its capacity to affect well-being. The developmental stage of adolescence can be particularly trying, as adolescents are often consumed with self-judgment and questioning their self-worth (Harter 1993; Jacobs et al. 2002). Additionally, as adolescents frequently feel alone on the emotional roller-coaster that they are experiencing, the component of common humanity may be particularly relevant to this stage of development. Despite the fact that self-compassion may have the potential to address adolescents' emotional needs, as of yet there has been only one study that has explored self-compassion with this age group (Neff and McGehee 2010). In this study, self-compassion was reported to correlate negatively with depression and anxiety, and positively with connectedness (a construct which articulates how strongly an individual feels connected to others). Additionally, it was found to partially mediate the relationship between family functioning variables (i.e., maternal support, attachment) and well-being (i.e., depression, anxiety, connectedness). Mindfulness was not measured in this study.

Thus, although there is some conceptual overlap between mindfulness and self-compassion, in that mindfulness includes a component of acceptance and self-compassion includes a component of maintaining balanced awareness when confronting challenges, they are fundamentally different in theory and applicability. Mindfulness, particularly as it was measured in this study, focuses on present moment awareness and responding to thoughts and feelings without judgment (Greco et al. 2011). Self-compassion, on the other hand, focuses on the *actions* utilized when encountering suffering; it entails the *active component* of engaging in self-soothing behavior (Germer 2009; Neff and Pommier 2013). Whereas mindfulness involves bringing attention and awareness to any moment with equanimity and balance, self-compassion is applicable specifically in moments of suffering. Mindfulness practice encourages one to feel one's pain (along with other sentiments including joy); self-compassion addresses not only soothing this pain, but recognizing that it is part of the human experience (Neff 2003b). Finally, mindfulness focuses on one's relationship with thoughts, feelings and sensations in the present moment; self-compassion specifically focuses on one's relationship with oneself (Baer et al. 2012). Due to these nuanced differences, recent studies consider and measure mindfulness and self-compassion as two distinct constructs (Baer et al. 2012; Keng et al. 2011; Kuyken et al. 2010; Robins et al. 2012; Van Dam et al. 2011).

Recognizing that mindfulness brings awareness to one's suffering and that self-compassion addresses and ameliorates that suffering, one would expect that as one becomes more mindful and aware of her suffering, they would initiate self-compassionate and self-comforting behavior. Thus, in this exploratory study of the relationships between the variables of mindfulness, self-compassion, and dimensions of emotional well-being, we posited that mediated through self-compassion, as defined by Neff (2003b), mindfulness will be linked to dimensions of emotional well-being in adolescents.

Method

Sample

Participants were recruited from a population of 9–12 grade high school students in one public high school in the southeast United States. To be able to generalize results across different socioeconomic groups, a school with a diverse socioeconomic student population served as the target school. The racial/ethnic composition of the students was 67.3 % White, 25.3 % African American, 1.3 % Asian/Pacific Islander, 5.7 % Hispanic, 0.4 % Native American/Alaskan. In addition, 44.2 % of students attending the school were classified as economically disadvantaged, based on whether they were receiving free or reduced lunch. Males comprised 50.8 % of the student population, and females comprised 49.2 %. The sample population of this study was somewhat less racially/ethnically diverse than the population of the school, and proportionally there were more females who participated in the study than males (see Table 1). Permission was requested from the school district through completing and submitting a district required proposal. Their approval of the project stipulated, however, that no class time could be used to administer the questionnaire. All students in the school were eligible to participate in this study.

Procedure

A packet was handed out to all 1,201 students in their English classes, which included a letter of introduction explaining the study, a consent form for parents and an assent form for students. English class was chosen as the venue to distribute packets because all students in the school attended an English class. As an incentive to encourage students to participate in the study, all student participants were entered in a drawing for an Ipad 2 and provided with a free cookie coupon. On the day that students took home the packet, a message was sent through the school's email/phone message system alerting parents of the opportunity for their child to participate, and an announcement was made over the school intercom system. Over the week, several additional announcements were made over the school intercom system, reminders were sent to parents through the email/phone call system, and 200 flyers were posted at the school advertising the study.

Prior to the week when the online survey would be available, 63 students had submitted consent and assent forms. Of these, 34 did not come to the school library to take the survey. When contacted, 13 of these students took the survey the following week. In addition, 24 additional students brought in consent forms during the week of data collection and were permitted to take the survey. In total, 89 students, or 7.41 % of all students invited provided consent and assent forms, and 67 students, or 5.66 % took the online survey.

Table 1 Descriptive data for demographics of sample (N = 65)

Variables	Percentage of total	
Gender		
Male	41.8	
Female	58.2	
Age		
14–15	40.3	
16–18	59.7	
Education level of parents	Mother	Father
Less than high school	3.0	3.0
High school graduate	10.4	14.9
Some college	17.9	10.4
College degree	29.9	34.3
Master's degree	25.4	13.4
Doctorate or professional degree	13.4	20.9
No answer		3.0
Race/ethnicity		
Black	11.9	
White	73.1	
Asian	1.5	
American Indian	1.5	
Hispanic/Latino	3.0	
Other	9.0	
Number of computers in household		
0–1	15.2	
2–3	50.7	
4–5	22.4	
6 or more	10.5	
Number of vacations in last year		
0	17.9	
1	29.9	
2	26.9	
3–4	23.9	
No answer	1.5	
Number of cars in household		
0	1.5	
1	10.4	
2	32.8	
3	40.3	
4	10.4	
5–7	4.5	

Two participants did not provide descriptive data

Data Collection

The following measures comprised the survey that students took online.

Mindfulness Children and Adolescent Mindfulness Measure (CAMM; Greco et al. 2011). This measure assesses mindfulness skills, which include both attention in the moment and acceptance of one's internal experiences. Factor analysis of this 10-item scale resulted in a one factor solution with a Cronbach's alpha of 0.80. Participants indicate their responses to each item using a 5-point Likert-type scale ranging from 0 (*never true)* to 4 (*always true).* Examples of items on this scale include: "It's hard for me to pay attention to only one thing at a time" and "I tell myself that I shouldn't feel the way I'm feeling." Construct validity was established through positive correlations of the scores from this measure with quality of life, academic competence, and social skills and negative correlations with somatic complaints and internalizing and externalizing behavior problems (Greco et al. 2011).

Positive and Negative Affect Positive and Negative Affect Scale (PANAS; Watson et al. 1988). The PANAS is comprised of two subscales: positive affect and negative affect. Positive affect is defined as "the extent to which a person feels enthusiastic, active, and alert" (Watson et al. 1988, p. 1063). Negative affect is defined as "a general dimension of subjective distress and unpleasurable engagement that subsumes a variety of aversive mood states, that includes anger, contempt, disgust, guilt, fear and nervousness" (Watson et al. 1988, p. 1063). This scale contains 10 emotion words that assess positive emotions and 10 words that assess negative emotions. Examples of positive emotion words are *strong*, *inspired*, and *excited.* Examples of negative emotion words are *ashamed, upset*, and *afraid.* The participant is asked to indicate how much he or she has experienced each of these emotions over the past few days. Participants indicate their responses to each item using a 4-point scale ranging from 1 (*very slightly or not at all*) to 4 (*most of the time*). Higher scores for PA indicate higher positive affect, and higher scores for NA indicate higher negative affect. The two subscales have been shown to have low correlation with each other ($r = -.22$), are internally consistent (Cronbach's alpha = .84–.87 for negative affect, and .86–.90 for positive affect) and stable over a 2-months time period ($r = .48$ for PA, $r = .42$ for NA) (Watson et al. 1988). In addition, past research demonstrates evidence for convergent and discriminant validity (Watson et al. 1988).

Self-Compassion Self-Compassion Scale (SCS; Neff 2003a). Self-compassion is defined as "the ability to hold one's feelings of suffering with a sense of warmth, connection, and concern" (Neff and McGehee 2010, p. 226). The 6 subscales that comprise the 26-item self-compassion scale are self-kindness (5 items, e.g. "When I'm going through a very hard time, I give myself the caring and tenderness I need"); self-judgment (5 items, e.g. "I'm disapproving and judgmental about my own flaws and inadequacies"); common humanity (4 items, e.g. "When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people"); isolation (4 items, e.g. "When I fail at something that's important to me, I tend to feel alone in my failure"); mindfulness (4 items, e.g. "When something upsets me I try to keep my emotions in balance") and over-identification (4 items, e.g. "When I'm feeling down I tend to obsess and fixate on everything that's wrong"). Participants indicate their responses to each item using a 5-point scale ranging from 1 (*Almost Never)* to 5 (*Almost Always).* Higher score indicates greater self-compassion. Reliability for this scale is excellent; Cronbach's alpha = .93 (Neff 2003a). To establish construct validity, the self-compassion scale was compared to similar established scales, and was reported to have a statistically significant negative correlation with the self-criticism subscale of the Depression Experience Questionnaire, a statistically significant positive correlation with the Social Connectedness scale, and statistically significant positive correlations with the three subscales of the Trait-Meta Mood Scale which include attention, clarity, and repair (Neff 2003a).

Life Satisfaction Student's Life Satisfaction Scale (SLSS; Huebner 1991). Global life satisfaction, a component of subjective well-being, refers to a judgment about one's well-being that is beyond that which is linked directly to well-being in specific domains (e.g. school, peers). Examples of items include "I have a good life" and "There are many things that I would like to change about my life". Participants indicated their responses to each item using a 4-point Likert-type scale ranging from 0 (*never)* to 3 (*almost always).* Higher scores indicate greater life satisfaction. Based on Diener et al. (1985) life satisfaction scale for adults, this scale has been validated for children age 8–14. Construct and discriminant validity were established through correlations with other well-being and affect scales, and comparisons to the correlations between similar scales in adults. Results were in the expected directions. The 7-item scale has a unidimensional factor structure, adequate temporal stability over 1–2 weeks (correlation = 0.74 with student samples from grades 4, 6, and 8), and good internal consistency (Cronbach's alpha = 0.82 with student samples from grades 4, 5, 6, and 8) (Huebner 1991). Further validation, internal consistency and test–retest reliability over 1 year was established in a later study with a sample of 9th, 10th, 11th, and 12th graders (Huebner et al. 2000). Coefficient alphas of .86 (Dew and Huebner 1994) and .84 (Gilman and Huebner 1997) were reported in additional studies with adolescent samples. Concurrent validity was evidenced in parent reports (Dew and Huebner

1994; Gilman and Huebner 1997) and teacher reports (Huebner and Alderman 1993).

Perceived Stress (PSS; Cohen et al. 1983). PSS was measured using a 14-item scale that is designed to assess the degree to which respondents find their lives "unpredictable, uncontrollable, and overloading" (Cohen et al. 1983, p. 387). Theoretically, it reflects cognitive reappraisal theory (Lazarus 1977), which emphasizes that it is the individual's personal and contextual appraisal of the event that is the chief determining factor in the resulting level of stress, rather than the nature of the objective event itself. Examples of items include, "In the last month, how often have you been upset because of something that happened unexpectedly?" and "In the last month, how often have you felt nervous or stressed?" Participants indicated their responses to each item using a 5-point Likert-type scale ranging from 0 (*never*) to 4 (*very often*). Content, predictive, and concurrent validity were established by Cohen et al. (1983) in a study of two college samples and one community sample. Construct validity for using this scale with adolescents was established in a study of adolescent psychiatric inpatients (Martin et al. 1995). In the latter study, a factor analysis of this scale produced two factors, one which was identified as perceived distress and the other which was identified as perceived coping. Cronbach's alpha for this adolescent sample was .86, which was consistent with that found in Cohen et al. (1983) college and community samples, and also with another study with early adolescents, which revealed a Cronbach's alpha of .88 (Yarcheski and Mahon 1999).

In addition to these measures, an 8-item questionnaire of demographic variables was included. This asked about the participant's age, gender, race/ethnicity and factors related to socioeconomic status.

Results

Initial Analyses

Means, Standard Deviations, and Cronbach's Alphas

Means and standard deviations were computed for all scale scores. Normality was investigated, and results indicated that all scales were normally distributed and means were similar to those reported in previous studies (Cohen et al. 1983; Greco et al. 2011; Huebner 1991; Huebner and Dew 1995; Huebner et al. 2000; Mahon and Yarcheski 2007; Neff and McGehee 2010; Van Dam et al. 2011; Watson et al. 1988). Cronbach's alphas for all scales were also calculated and found to be similar to those reported in previous studies (see Table 2).

Table 2 Means, standard deviations, and Cronbach's α for all scales, n = 67

Scale	Mean (SD)	Cronbach's α
CAMM	22.95 (7.40)	.87
SCS	2.98 (0.54)	.83
PA	36.05 (6.40)	.85
NA	25.92 (8.89)	.89
SLSS	2.82 (0.75)	.89
PSS	28.99 (8.01)	.79

CAMM Children and Adolescent Mindfulness Measure, *SCS* Self-compassion Scale, *PA* positive affect, *NA* negative affect, *SLSS* Student Life Satisfaction Scale, *PSS* Perceived Stress Scale

* Correlation is significant at the .05 level (2-tailed), ** Correlation is significant at the .01 level (2-tailed), *** Correlation is at the .001 level (2-tailed)

Bivariate Correlations and VIF Values

Bivariate correlations were computed for all scale scores to determine the relationships between variables. With the exception of the relationships between positive affect and self-compassion, and between positive and negative affect, all bivariate correlations were statistically significant and in the expected direction (see Table 3). Furthermore, to confirm statistically that self-compassion and mindfulness are in fact, separate constructs, the VIF value was calculated (VIF = 1.54).

Mediation Analyses

To determine mediation, four conditions must be met (Baron and Kenny 1986). First, the independent variable (X) must affect the dependent variable (Y); we will call this parameter "c". Second, the independent variable (X) must affect the mediator variable (M); we will call this parameter "a". Third, the mediator variable (M) must affect the dependent variable (Y) when controlling for the independent variable (X), this parameter is labeled "b".

Table 3 Bivariate correlations and confidence intervals, N = 67

	SCS	PA	NA	SLSS	PSS
CAMM	.59***	.26*	−.61***	.67***	−.61***
SCS		.22	−.64***	.52***	−.70***
PA			−.24	.43***	−.30*
NA				−.63***	.76***
SLSS					−.69***

CAMM Children and Adolescent Mindfulness Measure, *SCS* Self-compassion Scale, *PA* positive affect, *NA* negative affect, *SLSS* Student Life Satisfaction Scale, *PSS* Perceived Stress Scale

* Correlation is significant at the .05 level (2-tailed), ** Correlation is significant at the .01 level (2-tailed), *** Correlation is at the .001 level (2-tailed)

Last, when controlling for the mediator (M), the effect of the independent variable (X) on the dependent variable (Y), labeled as "c′", is eliminated in full mediation (Baron and Kenny 1986) and reduced in partial mediation (MacKinnon 2008). In other words, c′ must be less than c (Fig. 1).

The mediated effect is then calculated as the difference between the direct effect when no mediation is present and the case when mediation is controlled, i.e. c-c′. In this study, a path analysis model was used to estimate the effects of the predictor on the mediator and the mediator on each of the four dependent variables. Four separate models were created to estimate the parameters of the mediator, self-compassion, on the four separate dependent variables.

The procedure to estimate parameter weights was conducted using Mplus software (Muthén and Muthén 1998–2010) with maximum likelihood (ML) as the estimator for all dependent variables. First, the direct path was estimated using the direct model (c), and then the direct path (as well as other paths) was estimated in the mediated model (c′). The difference between these two direct path weights is c-c′, or the estimation of the mediated effect. The statistical significance of the mediated effect was then tested with a bootstrapping procedure. Bootstrapping is a non-parametric method which uses re-sampling with replacement to establish an estimate of a statistic, in this case, the indirect effect (Kline 2011; MacKinnon 2008). The bootstrapping method is recommended for determining significance of mediation when utilizing small to medium-sized samples (MacKinnon et al. 2004; Preacher and Hayes 2004; Shrout and Bolger 2002). Since the four mediated models are just-identified, it was not possible to provide indices of model fit (Mulaik et al. 1989).

It is important to note that because the data are cross-sectional and therefore temporally ambiguous, we cannot conclusively assert the temporal order of variables and determine the direction of influence. In order to do so, one must measure the variables at three separate points in time. However, to explore more extensively the posited mediational role of self-compassion, the mindfulness variable and self-compassion variable were switched and this alternate model also was analyzed.

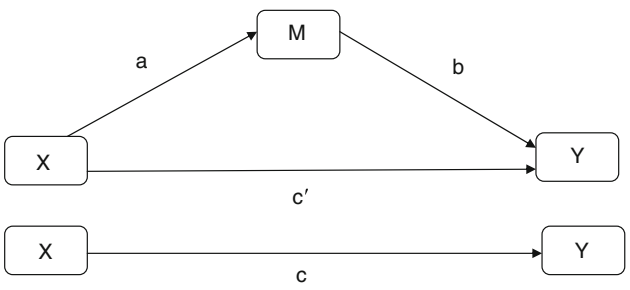

Fig. 1 Diagram of a direct effect (X→Y) and a mediated effect (X→M→Y)

A Priori Model: Self-Compassion as Mediator

Mindfulness was entered as the independent variable and self-compassion was entered as the potential mediator and each of the four dependent variables were entered in succession in separate analyses (Fig. 2). Results indicated that the path from mediator (self-compassion) to positive affect was non-significant, and therefore this model could not be considered for mediation because it did not meet the criteria established by Baron and Kenny (1986). However, when the decrease in magnitude of the mediated path with negative affect as the dependent variable was tested, bootstrapping analysis determined that this decrease was significant, indicating partial mediation [indirect $\beta = -0.03$, $p < .01$, 95 % CI $(-0.05, -0.01)$]. When life satisfaction was entered as the dependent variable, the path from self-compassion to life satisfaction was not significant, so no mediation could be tested. When perceived stress was introduced as the dependent variable, however, bootstrapping results indicated a significant mediated effect [indirect $\beta = -0.327$, $p < .001$, 95 % CI $(-0.50, -0.15)$]. The path weights associated with these results are provided in Table 4.

Alternate Model: Mindfulness as Mediator

Mediation was then examined in the alternate model where self-compassion was the independent variable and mindfulness was the mediator (Fig. 3). The paths from mindfulness to positive affect were non-significant, and therefore no mediation could be tested with these samples (Baron and Kenny 1986).When negative affect was entered as the dependent variable, bootstrapping results demonstrated partial mediation [indirect $\beta = -0.21$, $p < .01$, 95 % CI $(-0.34, -0.05)$]. Additionally, the bootstrapping procedure indicated that mindfulness fully mediated the

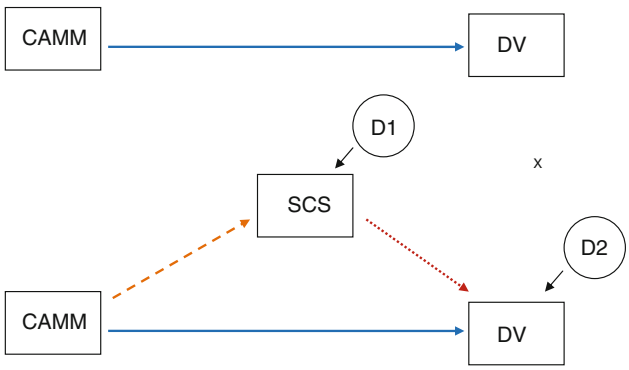

Fig. 2 Direct and mediated model with self-compassion as mediator

Table 4 A priori model with self-compassion as mediator

	Direct model		Mediated model	
DV	CAMM→DV	CAMM→DV	CAMM→SCS	SCS→DV
PA	.26*	.20 (ns)	.59**	.10 (ns)
NA	−.61**	−.36**	.59**	−.42*
SLSS	.67**	.56***	.59**	.20 (ns)
PSS	−.61***	−.31***	.59**	−.52***

CAMM Children and Adolescent Mindfulness Measure, *SCS* Self-compassion Scale, *PA* positive affect, *NA* negative affect, *SLSS* Student Life Satisfaction Scale, *PSS* Perceived Stress Scale

* Correlation is significant at the .05 level (2-tailed), ** Correlation is significant at the .01 level (2-tailed), *** Correlation is at the .001 level (2-tailed)

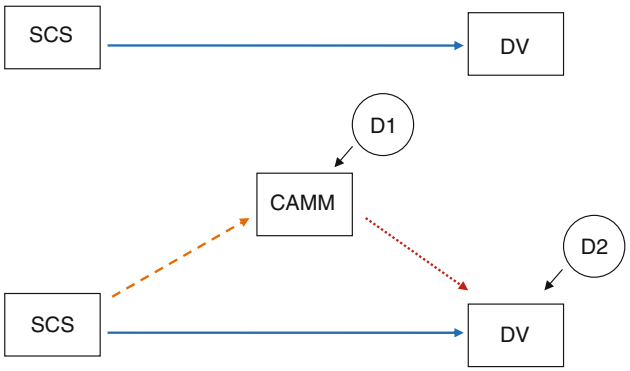

Fig. 3 Direct and mediated model with mindfulness as mediator

path from self-compassion to life satisfaction [indirect $\beta = -.33$, $p < .01$, 95 % CI (0.18, 0.47)]. When perceived stress was introduced as the dependent variable, bootstrapping results indicated partial mediation [indirect $\beta = -0.18$, $p < .01$, 95 % CI (−0.30, −0.06)]. The path weights associated with the mediational analyses of the alternate model are provided in Table 5.

Discussion

In recent studies, self-compassion has been reported to be a potentially influential mediator for the relationship between mindfulness and well-being for adult populations (Baer et al. 2012; Keng et al. 2011; Kuyken et al. 2010). Additionally, Neff (2003b) suggested that self-compassion may be particularly instrumental in impacting well-being in adolescents because of adolescents' tendencies toward negative self-judgments (Harter 1993; Jacobs et al. 2002), and found this to be the case in one study in which mindfulness was not measured (Neff and McGehee 2010). Recognizing the limitations of a cross-sectional study in investigating mediation, the purpose of this study was to explore the potential role of self-compassion as a mediator in the relationship between mindfulness and emotional well-being outcomes in an adolescent population.

Table 5 Alternate model with mindfulness as mediator

	Direct model		Mediated model	
DV	SCS→DV	SCS→DV	SCS→CAMM	CAMM→DV
PA	.22 (ns)	.10 (ns)	.59***	.20 (ns)
NA	−.64***	−.42***	.59***	−.36**
SLSS	.52***	.19 (ns)	.59***	.56***
PSS	−.70***	−.52***	.59***	−.31**

CAMM Children and Adolescent Mindfulness Measure, *SCS* Self-compassion Scale, *PA* positive affect, *NA* negative affect, *SLSS* Student Life Satisfaction Scale, *PSS* Perceived Stress Scale

* Correlation is significant at the .05 level (2-tailed), ** Correlation is significant at the .01 level (2-tailed), *** Correlation is at the .001 level (2-tailed)

To definitively establish mediation, it is essential to measure variables at three separate time points, with the posited mediator assessed at the middle time point (MacKinnon 2008). However, as a preliminary exploration of these relationships, cross-sectional data can be used, with the understanding that a follow-up longitudinal study would be the next step. In either case, it is first essential to ascertain a significant relationship between the predictor and outcome variables (Baron and Kenny 1986). Initial inspection of the correlation matrix indicated that there was a statistically significant relationship in the expected direction between mindfulness (the predictor) and each of the four well-being measures (outcome variables).

The second step to investigate mediation is to determine significance between the predictor (mindfulness) and the mediator (self-compassion) and between the mediator (self-compassion) and the outcome (dimensions of emotional well-being). As expected, there was a statistically significant association between self-compassion and mindfulness. In addition, self-compassion was associated in the expected directions with life satisfaction, negative affect and perceived stress, but not with positive affect.

A Priori Model

When self-compassion was investigated as a mediator, it partially explained the relationship between mindfulness and both negative affect and perceived stress. Being more attentive, aware, and accepting of that which one is facing in the moment can allow adolescents to become kinder and less critical of themselves. It is conceivable that when adolescents become increasingly aware of their thoughts, they can recognize the degree to which these thoughts are self-critical and harmful, and therefore take steps to treat

themselves with greater kindness. This ultimately can lead to improved emotional well-being.

Interestingly, the outcomes that are significantly mediated by self-compassion are the two that are constructs with negative connotations, i.e. negative affect and perceived stress. It appeared that in this adolescent sample, being kinder and more accepting of oneself was associated more with a decrease in negative outcomes than an increase in positive outcomes. This can be attributed to either a genuine greater effect of self-compassion on ameliorating these negative outcomes, or because adolescents relate more acutely to the negative items on the scales, and therefore respond more assuredly.

Alternate Model

Due to the limitations of investigating mediation in the cross-sectional design of this study, an alternate model where self-compassion was the predictor and mindfulness was the mediator was explored. Analyses revealed that mindfulness did, in fact, partially mediate the relationship between self-compassion and negative affect and self-compassion and perceived stress, and fully mediate the relationship between self-compassion and life satisfaction.

Note that when conceptualizing the constructs as they are in the alternate model, the component of mindfulness that seems to emerge as most salient is that of acceptance rather than awareness. This finding is consistent with previous research which found that the acceptance subscale was the component of mindfulness that differed when comparing clinical to non-clinical samples (Cardaciotto et al. 2008). It is plausible that when adolescents are less self-critical and see themselves as part of a greater humanity, they are more able to accept themselves and their present situation, seeing their own shortcomings and momentary frustrations as part of a natural course, rather than an experience that is unique to them. This perspective fosters self-acceptance that can then lead to less stress and greater emotional well-being.

The exploration of mediation in this study suggests a possible reciprocal association and iterative dynamic between mindfulness and self-compassion in that the awareness and attention that mindfulness supports may allow one to become more aware of thoughts. This awareness may then leads to recognition of the degree to which one is self-judging and ruminating, or over-identifying with negative thoughts. This pattern may be particularly salient for adolescents who are frequently self-judgmental (Harter 1993; Jacobs et al. 2002). This new awareness of the degree to which one is self-critical may then bring about a desire to be kinder to one's self and thus more self-compassionate. Through this, adolescents may then learn to be more accepting of themselves, understanding that their flaws do not have to define or overwhelm them. In fact, their imperfections may be seen as part of what makes them who they are, and as such, they are part of a common humanity of flawed individuals (Fig. 4).

How then might this interchange between mindfulness and self-compassion lead to increased emotional well-being? An acceptance of one's own imperfections and awareness that as part of being human, we are all flawed, may lead adolescents to have greater compassion for others' imperfections, recognizing that if their own flaws are forgivable, then others' flaws may be as well. Adolescents may be more willing to let go of potentially conflicting situations with friends, for example, thereby leading to less social pressure and stress among peers. In academic settings, a low test grade may be seen as a learning experience, an opportunity to acknowledge the need to study more, rather than a time to berate oneself for poor performance.

This decreased conflict with others and with oneself might lead to decreased stress and negative affect, and improved emotional functioning (Lazarus 2006). Greater interpersonal connection can act as a buffer against a fear of social rejection (Collins 1997) leading to an overall greater satisfaction with one's life. Items such as "My life is going well" and "I have a good life", items from the life satisfaction scale, are more likely to be responded to in the affirmative if relationships among friends are more stable and one experiences less stress and conflict in day-to-day life. A proposed empirical model of the relationships among these variables is provided (Fig. 5).

Although this study contributes to the limited literature on mindfulness, self-compassion and adolescents by

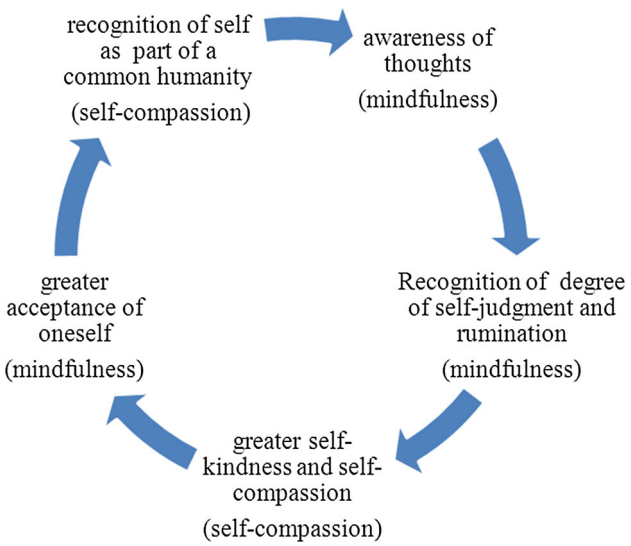

Fig. 4 Proposed model of reciprocal association between mindfulness and self-compassion

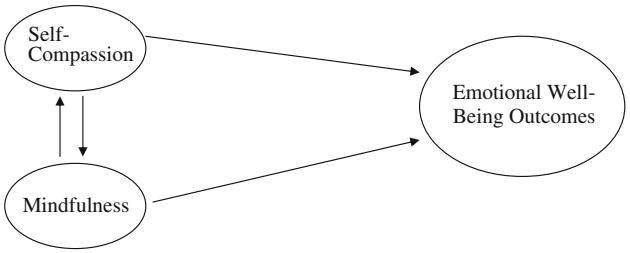

Fig. 5 New proposed model with reciprocal association between mindfulness and self-compassion

proposing a reciprocal interaction between mindfulness and self-compassion, there are a number of limitations that should be noted. First, the sample size was small and self-selected. It is possible that the incentive of winning an iPad or engaging in a survey taking place before school, after school, or during lunch might appeal to certain types of students. As such, it is possible that this sample may not generalize to the adolescent population as a whole.

Second, the model with reciprocal association between mindfulness and self-compassion could not be tested because it was not identified. In order for a model to be identified that has two variables with a reciprocal relationship, one of the variables must have a predictor variable or the disturbance terms must be correlated (Kline 2011). In this study, no predictor variable for either mindfulness or self-compassion was measured, and in path analysis, disturbance terms must remain uncorrelated.

Finally, all data for this study were collected at one point in time. Ideally, mediation studies should be conducted at three distinct time points. This allows for discernment of the impact of one variable on another, important when considering mediation (MacKinnon 2008). This initial exploratory study suggests that relationships between these variables should be followed up with longitudinal studies that investigate these variables more conclusively. However, in that the relationships between mindfulness, self-compassion, and emotional well-being have not been studied in adolescents, this study offers a significant contribution to the literature in this field.

Conclusions

The adolescent period can be challenging, sometimes fraught with negative self-evaluations and self-judgments. In this study, it was hypothesized that mindfulness could help adolescents through this difficult developmental stage by providing a pathway to emotional well-being, and self-compassion was hypothesized to be a way in which mindfulness could achieve these results. Findings suggest that both mindfulness and self-compassion may function as mediators with emotional well-being, and it was theorized that the two constructs engage in a dynamic iterative process which may culminate in improved well-being in adolescents. With this knowledge, an intervention can be created that teaches adolescents to be both more mindful and self-compassionate, thereby potentially leading to improvements in their emotional health. Implications might include a decrease in youth maladaptive trajectories including substance abuse, youth violence, bullying behaviors, and school absenteeism.

Acknowledgments Dr. Karen Bluth is funded by US National Institutes of Health, National Center for Complementary and Alternative Medicine, T32AT003378-04.

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