Mediating role of resilience in the impact of mindfulness on life satisfaction and affect as indices of subjective well-being

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ABSTRACT

Recent research has established the effect of mindfulness on subjective well-being. In this present study we attempt to extend the previous literature by investigating the potential mediating role of resilience in the impact of mindfulness on life satisfaction and affect as indices of subjective well-being. The Mindful Attention Awareness Scale (MAAS), Connor–Davidson Resilience Scale (CD-RISC), the Satisfaction with Life Scale (SWLS) and Positive and Negative Affect Schedule (PANAS) were administered to 327 undergraduate university students in India. Structural equation modeling (SEM) results showed that resilience partially mediated the relationship between mindfulness and life satisfaction and affect components. The findings corroborate an important role of resilience in mindfulness exerting its beneficial effects. This study makes a contribution to the potential mechanism of the association between mindfulness and subjective well-being.

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1. Introduction

Mindfulness has been conceptualized as a flexible state of consciousness of an individual encompassing refined attention and non-evaluative awareness of one's internal and external experiences as they take place (Brown & Ryan, 2003; Brown, Ryan, & Creswell, 2007). Further, mindfulness is said to be a state in which one is able to give uninterrupted attention over a period of time in a nonjudgmental way to ongoing physical, cognitive and psychological experience, without critically analyzing or passing a judgment on that experience (Kabat-Zinn, 1994). Mindfulness involves being aware of oneself and the environment in the present moment without judging or reacting non-intentionally, as well as being able to describe one's subjective experience (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). Mindfulness is also conceptualized as a psychological trait that refers to the tendency to be mindful in everyday life (Brown & Ryan, 2003). Levels of mindfulness may also be increased through meditation or mindfulness training (Baer et al., 2008; Falkenstrom, 2010).

Correlational research has demonstrated that measures of trait mindfulness are closely associated with higher levels of subjective well-being (Baer et al., 2008; Brown, Kasser, Ryan, Linley, & Orzech, 2009; Brown & Ryan, 2003; Howell, Digdon, Buro, & Sheptycki, 2008; Schutte & Malouff, 2011; Kong, Wang, & Zhao, 2014; Wenzel, von Versen, Hirschmüller, & Kubiak, 2015). It has also been firmly established that an increase in mindfulness through interventions such as meditation training also results in increase of individuals' well-being (e.g., Falkenstrom, 2010; Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008; Zautra et al., 2008; Aikens et al., 2014). Some studies which had college students as sample have shown that mindfulness may impact subjective well-being via mediators such as emotional intelligence, core self-evaluation, and self-esteem (Schutte & Malouff, 2011; Pepping, O'Donovan, & Davis, 2013). However, the model is still somewhat unsatisfactory with regard to its ability to explain how mindfulness conveys its beneficial effects on well-being because empirical evidence is merely in support of the partial mediating role of these mediators. We speculated that there are other potential mediators such as resilience that account for the mechanism underlying the mindfulness–subjective well-being relationship. In this study we attempt to investigate the mediating role of resilience in the impact of mindfulness on life satisfaction and affect as indices of subjective well-being.

Resilience is a personal trait that helps individuals cope with adversity and achieve good adjustment and development during trying circumstances. It is a trait that inoculates individuals against the impact of adversity and traumatic events (Connor & Davidson, 2003; Ong, Bergeman, Bisconti, & Wallace, 2006). In a review of trait mindfulness and resilience to trauma, Thompson, Arnkoff, & Glass (2011) suggest that a mindful and accepting orientation toward experience helps prevent ruminative and depressogenic thinking, thereby promoting psychological resilience following trauma. Resilience should be more pronounced in mindful individuals, as they will, for instance, engage less in rumination and habitual worrying (Shapiro, Brown, & Biegel, 2007; Verplanken & Fisher, 2014), but rather maintain a solution-focused outlook. Mindfulness demonstrates the potential to foster resilience as mindful people are better

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able to respond to difficult situations without reacting in automatic and non-adaptive ways. They are open to new perceptual categories, tend to be more creative, and can better cope with difficult thoughts and emotions without becoming overwhelmed or shutting down (Langer & Moldoveanu, 2000; Wallace & Shapiro, 2006). Neuroscience offers insights into how and why mindfulness may foster resilience. Mindfulness weakens the chain of associations that keep people obsessing about and even wallowing in a setback. Mindfulness strengthens the connections between the prefrontal cortex and the amygdala, promoting an equanimity that will help keep people from spiraling down the setback thoughts (Davidson & Begley, 2012). A study of 124 firefighters showed that trait mindfulness was negatively related to depressive and PTSD symptoms, physical symptoms, and alcohol problems, suggesting that trait mindfulness may reduce avoidant coping in response to stress and contribute to resilience (Smith et al., 2011).

Ryff, Singer, Dienberg Love, and Essex (1998) defined resilience as the capacity to maintain or recover high well-being in the face of life adversity. Studies have showed that resilient individuals could maintain their physical and psychological health both through buffering negative consequences from difficult times (Connor & Davidson, 2003), and through improving psychological well-being (Ryff & Singer, 2000). Thus, resilience can be seen as an important source of subjective well-being. There is strong evidence that resilience is of considerable benefit to people's subjective well-being. Resilience is found to be positively correlated with life satisfaction and positive affect, and inversely related to negative affect (Liu, Wang, & Li, 2012; Liu, Wang, & Lü, 2013; Lü, Wang, Liu, & Zhang, 2014; Mak, Ng, & Wong, 2011; Singh & Yu, 2010; Liu, Wang, Zhou, & Li, 2014; Hu, Zhang, & Wang, 2015).

Based on the above stated rationale and the existing literature showing that mindfulness is antecedent to resilience (Davidson & Begley, 2012; Foureur, Besley, Burton, Yu, & Crisp, 2013; Keye & Pidgeon, 2013; Pidgeon & Keye, 2014; Smith et al., 2011; Thompson et al., 2011) and resilience positively correlated with life satisfaction and affect (Hu et al., 2015; Liu et al., 2012; Liu et al., 2013; Liu et al., 2014; Lü et al., 2014; Mak et al., 2011; Singh & Yu, 2010), it was hypothesized that mindfulness exerts a significant indirect effect on life satisfaction and affect through the mediating effect of resilience. Specifically, individuals with higher mindfulness have greater resilience, and thereby increasing their life satisfaction and affect. The detailed hypothesized model concerning the mediator role of resilience in the relationship between mindfulness, life satisfaction, and affect is presented in Fig. 1.

Within the university environment resilience has been viewed as an asset that supports university students' mental health requirements (Hartley, 2012). University students experience larger number of issues concerning mental health as compared to their peers from a non-university background (Stallman, 2010). For university students,

resilience is particularly important, as life at a university can be quite complex and demanding, requiring the capability of coping with highly competitive academic/coursework demands, study/life balance, financial problems, and relationship related issues. Thus, the current study might shed light on a potential psychological mechanism for improving university students' well-being. Examining the role of resilience in university students will further contribute to knowledge in the field of wellbeing.

2. Method

2.1. Participants and procedure

Three hundred and twenty seven undergraduate students from India volunteered to take part in the study (236 men, 91 women), aged 18–23 years (M = 20.3, SD = 1.3). In a classroom environment participants were administered a packet of paper-and-pencil questionnaires by a trained research assistant. Participants completed previously developed and validated scales. A brief demographic survey was also included in the questionnaire. All participants were briefly instructed about the purpose of the study. They were ensured about confidentiality of the data. Participants completed the questionnaires in the classroom environment and a trained research assistant was available throughout the process to answer any queries raised by the participants and to also ensure their confidential and independent response. The students took about 15 min to complete all the instruments properly.

2.2. Measures

2.2.1. Mindfulness

To assess trait mindfulness, The Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003) was administered. This scale consists of 15 brief statements. It includes items such as, "I tend to walk quickly to get where I'm going without paying attention to what I experience along the way" and "I get so focused on the goal I want to achieve that I lose touch with what I'm doing right now to get there". Excellent test–retest reliability, good internal consistency, and good convergent and discriminant validity have been found with the MAAS (Brown & Ryan, 2003).

2.2.2. Life satisfaction

To assess life satisfaction in participants Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985) was administered. The SWLS consists of five brief statements. Using a seven-point Likert scale respondents were instructed to indicate the extent to which they

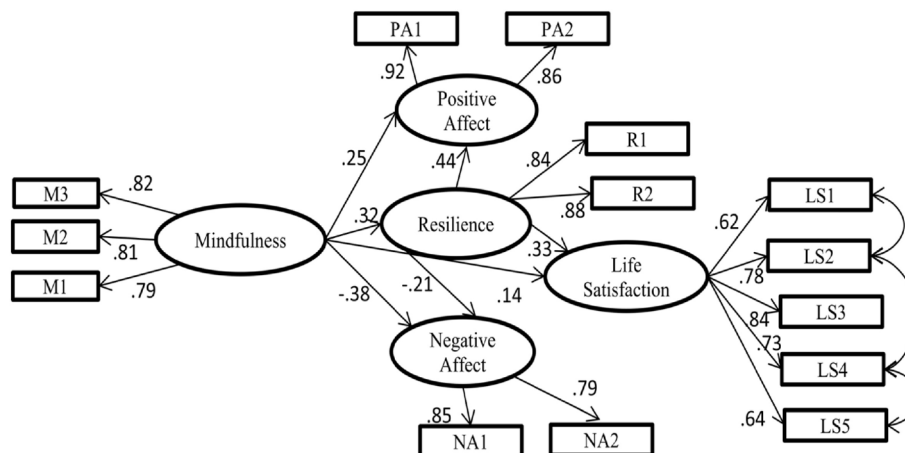
Fig. 1. The finalized structural model (N = 327). Note. Factor loadings are standardized. M1–M3 = three parcels of mindfulness; R1–R2 = two parcels of resilience; PA1–PA2 = two parcels of positive affect; NA1–NA2 = two parcels of negative affect.

agree or disagree with each statement. It includes items such as, "In most ways my life is close to my ideal" and "I am satisfied with my life". The SWLS has exhibited good psychometric properties (Pavot, Diener, Colvin, & Sandvik, 1991).

2.2.3. Resilience

The Connor–Davidson Resilience Scale (CD-RISC; Connor & Davidson, 2003) is a 25 item scale that measures the ability to cope with adversity. The 10 item version of this scale was used in this study. It includes items such as "able to adapt to change", "can stay focused under pressure", and "not easily discouraged by failure". Items were rated on a five-point Likert scale that ranges from 0 (not at all) to 4 (true nearly all of the time). Higher scores correspond to greater resilience. This scale demonstrated good internal consistency and construct validity (Campbell-Sills & Stein, 2007).

2.2.4. Positive and negative affect

The Positive and Negative Affect Scales (PANAS; Watson, Clark, & Tellegen, 1988) assess positive and negative affect. The PANAS consists of 10 affective adjective words, and positive affect words such as "enthusiastic", "active" and "alert" and negative affect words such as "guilty", "ashamed" and "distressed" have been used respectively. Participants were asked to indicate how often they generally experience positive and negative emotions on a 5-point Likert scale where 1 stood for "very slightly or not at all"and 5 for "extremely". Both subscales of the PANAS demonstrated high reliability, and also excellent psychometric properties in college samples (Watson et al., 1988).

2.3. Data analysis

To analyze the mediation effects, the two-step procedure recommended by Anderson and Gerbing (1988) was used. The measurement model was first tested to assess whether each of the latent variable was represented by its indicators. If the measurement model turns out satisfactory, then the structural model can be tested using the maximum likelihood estimation in the AMOS 18.0 program. To control for inflated measurement errors due to multiple items for the latent variable, three item parcels for mindfulness scale and two item parcels for resilience and positive and negative affect factors were created. These parcels were created using a random assignment approach (i.e. assigning each item randomly and without replacement, to one of the parcel groupings; Little, Cunningham, Shahar, & Widaman, 2002). Life satisfaction latent variable was defined using the items of the SWLS because it consisted of only five items.

The adequacy of model fit was examined through the following four goodness-of-fit indices (Hu & Bentler, 1999): chi-square statistics; Root-Mean-Square Error of Approximation (RMSEA) of .06 or less; Standardized Root-Mean-Square Residual (SRMR) of .08 or less; and Comparative Fit Index (CFI), best if above .95. To compare two or more models, we additionally examined Akaike Information Criterion (AIC: Akaike, 1987) with smaller values being indicative of a better fit of the hypothesized model and Expected Cross-Validation Index (ECVI: Browne & Cudeck, 1993) with the smallest values representing the greatest potential for replication.

3. Results

3.1. Preliminary analyses

Descriptive statistics, reliability estimates (Cronbach's alpha coefficients), and correlations for all the study variables are presented in Table 1.

Table 1
Means, standard deviations (SD), reliabilities and intercorrelations among study variables.

Measure	Mean	SD	α	1	2	3	4
1. Mindfulness	3.89	0.76	0.83				
2. Resilience	2.58	0.57	0.85	0.27[**]			
3. Life satisfaction	3.88	1.23	0.85	0.18[**]	0.29[**]		
4. Positive affect	3.57	0.64	0.83	0.35[**]	0.44[**]	0.35[**]	
5. Negative affect	2.05	0.57	0.82	−0.36[**]	−0.29[**]	−0.27[**]	−0.15[**]

Note: α = Cronbach's alpha.
[**] Correlation is significant at the 0.01 level (2-tailed).

3.2. Measurement model

The measurement model consisted of five latent factors (mindfulness, resilience, positive affect, negative affect and life satisfaction) and 14 observed variables revealed very satisfactory fit to the data: $\chi^2 = 127.3$, df $= 67$, p $< .01$; RMSEA $= .053$; SRMR $= .053$; and CFI $= .97$. All the factor loadings for the indicators on the latent variables were reliable (p $< .001$), signifying that all the latent factors were well represented by their respective indicators.

3.3. Structural model

The direct path coefficients from the predictor (mindfulness) to the criterion (life satisfaction, b $= .25$, p $< .001$; positive affect, b $= .41$, p $< .001$, and negative affect b $= −.45$, p $< .001$) in the absence of the mediator were reliable. A partially-mediated model (Model 1) with a mediator and three direct paths from mindfulness to life satisfaction, positive affect, and negative affect revealed a good fit to the data: $\chi^2 = 156.4$, df $= 70$, p $< .01$; RMSEA $= .062$; SRMR $= .072$; and CFI $= .95$. According to the modification index the error terms of life satisfaction were allowed to be correlated. The results indicated that the meditational model with the above correlated error terms fit the data well ($\chi^2 = 121.7$, df $= 67$, p $< .01$; RMSEA $= .050$; SRMR $= .060$; and CFI $= .97$) and improved the model fit ($\Delta\chi^2$ (1, N $= 327$) $= 34.7$, p < 0.001). When comparing Model 2 to Model 1, a smaller AIC indicated that the fit of Model 2 was more satisfactory (Table 2).

Bootstrapping procedures in AMOS were used to test the significance of the partially-mediated model. Following the suggestions of MacKinnon, Lockwood, and Williams (2004), we generated 10,000 bootstrapping samples from the original data set (N $= 327$) by random sampling. If 95% CI for the estimates of mediation effect does not consist of zero, the mediation effect will be significant at the .05 level. Table 3 displays the indirect effects and their associated 95% confidence intervals. As shown in Table 3, mindfulness exerted significant indirect effects on life satisfaction and affect via resilience.

4. Discussion

The primary aim of the present study was to analyze the significance of mindfulness in life satisfaction and affect and to extend the previous literature by investigating the potential mediating role of resilience in the impact of mindfulness on life satisfaction and affect as indices of subjective well-being. Consistent with prior studies (Kong et al., 2014; Wenzel et al., 2015; Schutte & Malouff, 2011), mindfulness was found to correlate positively with life satisfaction and positive affect and correlate negatively with negative affect. Although some previous research

Table 2
Fit indices among competing models.

	χ^2	df	RMSEA	SRMR	CF1	AIC	ECVI
Model 1	156.4	70	0.062	0.072	0.95	226.44	0.695
Model 2	121.7	67	0.05	0.06	0.97	197.65	0.606

Note: N $= 327$; RMSEA $=$ Root Mean Square Error Of Approximation; SRMR $=$ Standardized Root-Mean-Square Residual; CFI $=$ Comparative Fit Index; AIC $=$ Akaike Information Criterion; and ECVI $=$ Expected Cross-Validation Index.

Table 3
Bootstrapping indirect effects and 95% confidence intervals (CI) for the final mediational model.

Model pathways	Point estimates	95% CI	
		Lower	Upper
Mindfulness → resilience → life satisfaction	.132	.067	.235
Mindfulness → resilience → positive affect	.138	.074	.228
Mindfulness → resilience → negative affect	−.054	−.110	−.013

has examined the role of mediators in mindfulness and wellbeing, there is little research that has investigated the mediating role of resilience between mindfulness and wellbeing. The present study found that resilience did significantly mediate between mindfulness and greater life satisfaction, higher positive affect, and lower negative affect. The results have supported the study predictions. These results are consistent with earlier studies on the association between resilience and subjective well-being (Liu et al., 2012; Liu et al., 2013; Lü et al., 2014; Mak et al., 2011). The theoretical underpinning for this hypothesis is that the awareness and acceptance aspects of mindfulness may facilitate the development of greater resilience and that the optimism, zest, and patience characteristics of resilient individuals, may lead to greater wellbeing (Thompson et al., 2011; Block & Kremen, 1996; Bonanno, 2004; Kjeldstadli et al., 2006; Cohn, Fredrickson, Brown, Mikels, & Conway, 2009; Rees, Breen, Cusack, & Hegney, 2015). Pausing and observing the mind may resist getting drawn into wallowing in a setback. Mindfulness produces emotional balance and may help in faster recovery from setbacks (Davidson & Begley, 2012). High levels of mindfulness may help people maintain a decentered attitude toward difficult situations and foster resilience, and that may lead to wellbeing. Mindful people are better able to respond to difficult situations without reacting in automatic and non-adaptive ways. They are open to new perceptual categories, tend to be more creative, and can better cope with difficult thoughts and emotions without becoming overwhelmed or shutting down. These results highlight the importance of resilience in the relationship between mindfulness and well-being. The findings thus provide evidence of a connection between mindfulness and resilience and between those two characteristics and subjective well-being. As the results showed, mindfulness leads to higher resilience, and this provides information regarding one possible process through which mindfulness exerts its beneficial effects. Further, interventions in mindfulness training could provide a practical means of enhancing resilience and personality characteristics like optimism, zest, and patience and enhanced resilience will lead to greater subjective well-being. The findings provide support for universities to develop strategies that promote mindfulness and resilience in university students to enhance well-being of students under academic pressures.

The present study has several limitations. First, the data relied exclusively on self-report measures, and although the measures were selected for their good reliability and validity, self-report measures are prone to bias, as participants tend to give responses which have social desirability. The use of multiple assessment methods for evaluation may lower the impact of subjectivity. Second, this study had a cross-sectional design which cannot determine a causal relationship, so interpretation of the results of mediation analysis on cross-sectional data must always proceed with caution. Future research using longitudinal and experimental studies can be undertaken which may provide additional insights into relationships between mindfulness, resilience and life satisfaction and affect. Third, the present findings are based on a single dimensional measure of mindfulness. It may be useful to also examine multidimensional operationalization of mindfulness that suggests that present-moment attention and awareness is just one of the many multiple facets of mindfulness that may enhance subjective well-being. Future investigation could further clarify which dimensions of mindfulness such as non-judgmental, non-reactive etc. relate to resilience. Future research might also explore the possible mediating role

of resilience in the relationship between mindfulness and other variables such as self-esteem and happiness.

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