



The origins of individual differences in dispositional mindfulness



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ABSTRACT

A large and coherent body of evidence reveals that high dispositional mindfulness is a positive personal resource, yet remarkably little is known about the origins of individual differences in mindfulness. Attachment theory describes how early experiences with caregivers shape psychosocial development across the lifespan. Drawing from attachment theory, we propose that those who have received sensitive and responsive caregiving in childhood are more likely to have a secure attachment style which may, in turn, provide greater capacity for mindfulness. In an adolescent sample attending a large urban university (Study 1), there were indirect effects of parental rejection and parental warmth on mindfulness via attachment anxiety and avoidance. In Study 2 we tested the same hypotheses in a group of adolescent high school students and replicated the above pattern of results. In brief, both retrospective reports (Study 1) and current reports (Study 2) of the quality of parenting received were associated with individual differences in mindfulness via attachment processes. This research suggests that the origins of individual differences in dispositional mindfulness may have their roots in early childhood experiences.

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1. Introduction

1.1. Individual differences in dispositional mindfulness

Much evidence attests to the benefits of high dispositional mindfulness on a wide range of psychosocial outcomes (Brown & Ryan, 2003; Keng, Smoski, & Robins, 2011). Mindfulness is often defined as the process of “paying attention in a particular way: on purpose, in the present moment, non-judgementally” (Kabat-Zinn, 1994, p. 4) and “the non-judgmental observation of the ongoing stream of internal and external stimuli as they arise” (Baer, 2003, p. 125). In contrast to mindfulness, *mindlessness* refers to the relative absence of mindfulness, and is characterized by attention being directed to the future or the past, a preoccupation with thoughts, emotions, fantasies and planning, and behaving on automatic pilot rather than with conscious awareness (Baer, Smith, & Allen, 2004; Brown & Ryan, 2003). Brown and Ryan (2003) note that mindlessness is often defensively motivated whereby individuals may be unwilling to attend to particular thoughts, emotions or experiences that arise.

In addition to the practice of cultivating mindfulness through meditation, the term mindfulness can refer to a state or quality of awareness, or to a psychological trait (Brown & Ryan, 2003; Germer, Siegel, & Fulton, 2005). A mindful state is characterized by directing bare attention toward the present moment, and attending only to experiences

actually observed rather than reacting based on habitual responses or prior history (Brown, Ryan, & Creswell, 2007). It has been proposed that almost all individuals are capable of mindfulness, but there are individual differences in dispositional mindfulness, and mindfulness may therefore be conceptualized as a trait-like construct (Brown & Ryan, 2003; Kabat-Zinn, 2003). As such, dispositional mindfulness refers to an individual's capacity and “tendency to abide in mindful states over time” (Brown et al., 2007, p. 218). The development of self-report measures of dispositional mindfulness (e.g., Baer et al., 2004; Baer et al., 2008; Brown & Ryan, 2003) has provided substantial evidence to indicate that individuals do indeed differ in naturally occurring dispositional mindfulness, and that these individual differences predict psychosocial outcomes in theoretically meaningful ways.

High dispositional mindfulness is associated with increased life satisfaction (Brown & Ryan, 2003), healthy emotion regulation (Baer et al., 2004; Pepping, Davis, & O'Donovan, 2013), lower depression and anxiety, more positive affect and less negative affect (Brown & Ryan, 2003), secure attachment (Pepping, O'Donovan, & Davis, 2014; Shaver, Lavy, Saron, & Mikulincer, 2007), and increased self-esteem (Pepping, O'Donovan, & Davis, 2013). High dispositional mindfulness is also associated with romantic relationship satisfaction (Barnes, Brown, Krusemark, Campbell, & Rogge, 2007; Wachs & Cordova, 2007), initial romantic attraction in women (Janz, Pepping, & Halford, 2015) and satisfaction with interpersonal relationships (Pepping, O'Donovan, Zimmer-Gembeck, & Hanisch, 2014). In brief, individuals higher in dispositional mindfulness fare better than their less mindful counterparts on a wide range of psychological and social outcomes.

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However, remarkably little is known about the origins of dispositional mindfulness.

1.2. The origins of dispositional mindfulness

Several researchers have suggested that the capacity for mindfulness may have its roots in early childhood experiences (Ryan, Brown, & Creswell, 2007; Shaver et al., 2007). Ryan et al. (2007) proposed that individuals who experience sensitive and responsive caregiving characterized by love and support for autonomy may have greater capacity for mindfulness. Specifically, the development of mindful awareness and capacity for self-observation is “facilitated by providers who can be attuned to, mirror, and resonate with the infant’s experience” (Ryan et al., 2007, p. 180), whereas individuals who grow up in abusive or rejecting environments may have this capacity for mindful attention impaired (Ryan et al., 2007). We agree with this proposition, and in light of recent evidence indicating that individuals with a secure attachment style also tend to be more mindful (Pepping et al., 2014; Pepping, O’Donovan, Zimmer-Gembeck, & Hanisch, 2015; Shaver et al., 2007), we propose that attachment theory may be a useful framework for conceptualizing the origins of individual differences in dispositional mindfulness.

1.3. Attachment theory and origins of mindfulness

Attachment refers to the affectional bond formed between an infant and caregiver during the early years of life (Bowlby, 1969; Mikulincer & Shaver, 2007). Bowlby (1969) proposed that humans have a biologically evolved *attachment behavioural system* that motivates infants to seek proximity to stronger and wiser caregivers to protect the infant from harm. When caregivers are reliably available, sensitive, and responsive, an infant develops a secure attachment style and “is likely to experience felt security — a sense that the world is generally safe, that attachment figures are helpful when called upon, and that it is possible to explore the environment curiously and confidently and to engage rewardingly with other people” (Mikulincer & Shaver, 2007, p. 21). When infants do not experience responsive caregiving, they adopt secondary, insecure attachment strategies (Main, 1990).

The attachment system is active across the lifespan (Bowlby, 1969; Mikulincer & Shaver, 2007). Attachment in adulthood is conceptualized along two dimensions: attachment anxiety, which is characterized by fear of rejection, concern about relationships, and fear of abandonment; and attachment avoidance which reflects discomfort with intimacy and closeness (Fraley, Waller, & Brennan, 2000; Mikulincer & Shaver, 2007). Individuals who are low in anxiety and avoidance are said to have a secure attachment style. Insecure attachment (high attachment anxiety and/or avoidance) has consistently been shown to predict poorer psychosocial adjustment, whereas secure attachment (low attachment anxiety and avoidance) is consistently associated with a wide variety of positive psychosocial outcomes (Mikulincer & Shaver, 2007).

It is well established that sensitive and responsive parenting leads to the development of a secure attachment style in childhood and adulthood (Grossman, Grossman, & Waters, 2005; Van Ijzendoorn & Bakermans-Kranenburg, 2004), and there is moderate continuity of these attachment patterns across the lifespan (Fraley, 2002). The quality of parenting received in childhood predicts a wide range of other outcomes that are related to mindfulness. For example, authoritarian parenting from fathers has been linked with heightened neuroticism (Patock-Peckham & Morgan-Lopez, 2009), which is inversely related to mindfulness (Brown & Ryan, 2003). Similarly, poor parental bonds with fathers are associated with higher depression (Patock-Peckham & Morgan-Lopez, 2007), and greater parental neglect is associated with symptoms of stress (Backer-Fulghum, Patock-Peckham, King, Roufa, & Hagen, 2012), both of which are inversely correlated with mindfulness (Brown & Ryan, 2003; Keng et al., 2011). In brief, the quality of parenting received in childhood is associated with attachment

security, and a range of other indices of well-being that are related to mindfulness. It therefore seems likely that the quality of parenting received in childhood may influence not only attachment patterns, but also a range of other psychosocial outcomes, including the development of mindfulness.

Recent research reveals that attachment and mindfulness are related (Pepping, O’Donovan, Zimmer-Gembeck, & Hanisch, 2015; Shaver et al., 2007; Walsh, Balint, Smolira, Fredericksen, & Maden, 2009) such that those with a secure attachment style also tend to be more mindful. Pepping et al. (2014) recently found that the two dimensions of attachment insecurity (anxiety and avoidance) predicted 18.8% of the variance in mindfulness in non-meditators, and 43.3% of the variance in mindfulness in a group of experienced meditators. There may be a bi-directional causal association between attachment and mindfulness, whereby individuals with a secure attachment style may have greater capacity to focus attention on the present moment without worrying about rejection and abandonment (attachment anxiety) and without defending against threatening emotions or intimacy (attachment avoidance; Ryan et al., 2007; Shaver et al., 2007). On the other hand, individuals higher in mindfulness may be less consumed with thoughts and emotions related to insecure attachment (Ryan et al., 2007; Shaver et al., 2007). Recently, Pepping, Davis, and O’Donovan (2015) examined this bi-directional association using very brief experimental procedures. Results revealed that priming attachment security did not lead to an increase in state mindfulness, and increasing state mindfulness did not lead to an increase in state security. However, these were very brief experimental manipulations and the possibility remains that over time, attachment security may facilitate greater mindfulness and vice-versa.

Rather than being defensively on guard to avoid being rejected or injured, an individual with a secure attachment style can focus his or her attention on the present moment in an open and non-judgemental manner, which may provide greater capacity for mindfulness (Ryan et al., 2007). Individuals with a secure attachment style have typically experienced caring and supportive interactions with attachment figures during times of distress (Grossman et al., 2005; Van Ijzendoorn & Bakermans-Kranenburg, 2004), which is associated with comfort in the knowledge that others will be supportive and responsive in times of distress, and individuals with a secure attachment style can therefore divert attention to other activities rather than worrying about possible abandonment or being cautious of closeness (Mikulincer & Shaver, 2007). We propose that sensitive and responsive parenting should lead to secure attachment, which in turn may provide greater capacity for mindfulness.

To date, only one study has investigated the association between reports of parenting received in childhood and mindfulness. In an important investigation of predictors of dispositional mindfulness, Walsh et al. (2009) found that retrospective reports of parental nurturance did not predict mindfulness. However, participants’ experience with mindfulness meditation practice was not assessed, and it is therefore difficult to draw firm conclusions from this study. Given that experience in mindfulness meditation leads to increases in mindfulness (Lykins & Baer, 2009), in order to accurately examine predictors of ‘naturally occurring’ dispositional mindfulness, it is necessary to exclude individuals who have engaged in practices that systematically enhance mindfulness. This is important given the possibility that those who have experienced low parental nurturance may be particularly motivated to practise mindfulness meditation to alleviate the cognitive and emotional difficulties arising from difficult childhood experiences. In addition, the relationship between parenting received in childhood and dispositional mindfulness is likely to be complex and may be indirect.

2. Study 1

Remarkably little is known about the origins of individual differences in dispositional mindfulness. Several researchers have proposed

that the origins of dispositional mindfulness may have their roots in early childhood experiences and attachment processes (Ryan et al., 2007; Shaver et al., 2007). Here we examined whether sensitive and responsive parenting received in childhood (operationalized by high parental warmth and low parental rejection) would be associated with higher mindfulness via attachment security (low anxiety and avoidance). Because our research aimed to identify developmental origins of dispositional mindfulness, we tested this hypothesis in an adolescent sample attending a large urban university. It was predicted that there would be indirect effects of sensitive and responsive parenting on higher mindfulness via low attachment anxiety and avoidance.

2.1. Method

2.1.1. Participants

Adolescence often refers to ages 10 to 24 years (Steinberg, 2011). Therefore, participants were required to be 24 years or younger. Only those with no prior experience in mindfulness meditation were able to participate in the study. Participants were 128 adolescent students attending a large urban university. The sample consisted of 103 females and 25 males, ranging in age from 16 to 24 ($M = 19.34$, $SD = 2.24$).

2.1.2. Measures

2.1.2.1. Mindfulness. Participants completed the Child and Adolescent Mindfulness Measure (CAMM) to assess dispositional mindfulness (Greco, Baer, & Smith, 2011a, 2011b; de Bruin, Zijlstra, & Bögels, 2014; e.g., “At school, I walk from class to class without noticing what I’m doing” and “I think about things that have happened in the past instead of thinking about things that are happening right now”). Cronbach’s alpha in the current sample was satisfactory ($\alpha = .83$).

2.1.2.2. Parenting received in childhood. The Parent as Social Context Questionnaire-Adolescent Report (PASCQ-AR) was used to assess adolescent reports of the style of parenting received in childhood (Skinner, Johnson, & Snyder, 2005). Here we focussed only on reports of parental warmth (e.g., “My parents let me know they love me”) and parental rejection (e.g., “My parents make me feel like I’m not wanted”). Internal consistency in the present sample was high for both Warmth ($\alpha = .86$) and Rejection ($\alpha = .87$).

2.1.2.3. Attachment. The Experiences in Close Relationship-Revised-General Short Form (ECR-R-GSF; Wilkinson, 2011) consists of two subscales that assess the two dimensions of attachment insecurity in adolescence; Anxiety (e.g., “I often worry that other people close to me don’t really love me”) and Avoidance (e.g., “I prefer not to show others how I feel deep down”). In the present sample, Anxiety ($\alpha = .91$) and Avoidance ($\alpha = .89$) had high internal consistency.

2.1.3. Procedure

Full ethics approval was obtained from the University Human Research Ethics Committee. Students were invited to participate in the

online questionnaire for 1 hours’ credit toward their introductory psychology course, and participants completed an online questionnaire that included the measures mentioned above, as well as some additional measures unrelated to the present research. Participants were informed that the purpose of the study was to assess the development of a range of individual difference factors during adolescence.

2.2. Results

Means, standard deviations and a correlation matrix are presented in Table 1. The indirect effects of parental warmth and rejection on mindfulness via attachment were examined using bootstrapping methods with 20,000 bootstrap samples. We used the INDIRECT Macro recommended by Preacher and Hayes (2008) which provides a test of the associations between the independent variable, mediators, and dependent variable concurrently in the form of regression coefficients. It also tests the significance of the indirect effect of the independent variables (parental warmth and parental rejection) on the dependent variable (mindfulness), via the proposed mediators (attachment anxiety and avoidance).

With regard to the association between parenting and the proposed mediators (Path A), parental warmth was associated with low attachment anxiety ($b = -.86$, $p = .005$) and low attachment avoidance ($b = -1.04$, $p < .001$). Parental rejection was associated with high attachment anxiety ($b = 1.14$, $p < .001$) and high attachment avoidance ($b = .92$, $p < .001$). Moreover, as shown in Table 3, participants who reported higher parental warmth and lower parental rejection were higher in mindfulness (Path C). Both mediators (attachment anxiety and avoidance) were associated with low mindfulness (Path B). Regarding mediation, as displayed in Table 3, the bias-corrected confidence intervals reveal that there were indirect effects of parental warmth on high mindfulness via reduced attachment anxiety and avoidance, and indirect effects of parental rejection on low mindfulness via heightened attachment anxiety and avoidance. The direct effects of parental warmth and rejection on mindfulness were no longer significant when the mediators were accounted for. The model testing parental warmth on mindfulness via attachment accounted for 26.8% of the variance in mindfulness ($R^2 = .268$), and the model testing parental rejection on mindfulness via attachment accounted for 28.6% of the variance in mindfulness ($R^2 = .286$)¹.

2.3. Discussion

Study 1 examined whether reports of parental rejection and warmth in a sample of adolescent university students were associated with individual differences in dispositional mindfulness via attachment processes. Results revealed that high parental rejection was associated with low mindfulness via heightened attachment anxiety and avoidance, and high parental warmth was associated with high mindfulness via low attachment anxiety and avoidance. These findings suggest that the origins of dispositional mindfulness may indeed have their roots in early childhood experiences and attachment processes. However, it is acknowledged that the retrospective reports of experiences of parenting limits the extent to which definitive conclusions can be drawn. Therefore, in Study 2 we tested the same hypotheses in adolescent school children reporting on current experiences of parenting.

3. Study 2

Study 2 investigated whether sensitive and responsive parenting would be associated with increased mindfulness via attachment processes in a sample of school students reporting on their current

Table 1
Means, standard deviations and correlation matrix (Study 1).

	Means (SD)	Mindfulness	Parental warmth	Parental rejection
Mindfulness	21.57 (6.53)	1		
Parental warmth	13.53 (2.49)	.27**	1	
Parental rejection	7.28 (3.09)	-.40***	-.75***	1

Notes: $N = 128$.

** $p < .01$.

*** $p < .001$.

¹ In both Studies we re-ran the analyses controlling for gender, and obtained the same pattern of direct and indirect effects.

experiences of parenting. It was hypothesized that sensitive and responsive parenting (operationalized by high parental warmth and low parental rejection) would predict high dispositional mindfulness, and these associations would be mediated by low attachment anxiety and avoidance.

3.1. Method

3.1.1. Participants

Participants were 113 high school students from an Anglican high school. The sample consisted of 63 females and 50 males, ranging in age from 12 to 18 ($M = 14.90$, $SD = 1.60$). Inclusion criteria included current enrolment at the high school and no prior experience in mindfulness meditation. Participants were able to enter a draw to win one of five \$50 gift vouchers as incentive for participation.

3.1.2. Measures

3.1.2.1. Attachment. The Experiences in Close Relationships-Revised-General Short Form, as described in Study 1, was used to assess attachment in the present sample. Both the Anxiety ($\alpha = .88$) and Avoidance ($\alpha = .77$) subscales had adequate internal consistency.

3.1.2.2. Parenting. The Parent as Social Context Questionnaire-Adolescent Report (Parental Warmth and Rejection subscales) described in Study 1 assessed reports of current experiences of parenting. Both Parental Warmth ($\alpha = .83$) and Parental Rejection ($\alpha = .83$) displayed high internal consistency in the present sample.

3.1.2.3. Child and Adolescent Mindfulness Measure. The Child and Adolescent Mindfulness Measure (CAMM; Greco et al., 2011a), as described in Study 1, assessed dispositional mindfulness. The CAMM displayed high internal consistency in the current sample ($\alpha = .83$).

3.1.3. Procedure

Full ethics approval was provided by the University Human Research Ethics Committee. Participants were recruited in a number of ways. First, the study was advertised to students in an electronic newsletter providing the link to the online questionnaire. Secondly, teachers were provided handouts to distribute to students wishing to participate. Finally, school visits were conducted whereby the second author spoke to students and staff about participation in the research. Consistent with ethical approval, parents were notified of the study through the electronic newsletter, providing them with the opportunity to discuss with their child whether participation in the study was appropriate. Additionally, students were encouraged to first discuss their participation with their caregivers. Participants were informed that the research was designed to assess the development of individual difference factors during adolescence.

Table 2
Means, standard deviations and correlation matrix (Study 2).

	Means (SD)	Mindfulness	Parental warmth	Parental rejection
Mindfulness	22.20 (7.00)	1		
Parental warmth	13.50 (2.45)	.11	1	
Parental rejection	7.36 (3.12)	-.49***	-.51***	1

Notes: $N = 113$.

*** $p < .001$.

3.2. Results

Means, standard deviations and a correlation matrix are presented in Table 2. Consistent with Study 1, the indirect effects of parental warmth and rejection on mindfulness via attachment were examined using bootstrapping methods with 20,000 bootstrap samples.

Parental warmth was associated with low attachment anxiety ($b = -1.24$, $p < .001$) and low attachment avoidance ($b = -.46$, $p = .044$). Parental rejection was associated with high attachment anxiety ($b = 1.41$, $p < .001$) and high attachment avoidance ($b = .51$, $p = .004$; Path A). As displayed in Table 4, adolescents reporting higher parental rejection reported lower mindfulness (Path C). High parental warmth was not directly associated with mindfulness, though the significance of the association between the IV and DV (Path C) is not a requirement for mediation (Hayes, 2009). Both mediators (attachment anxiety and avoidance) were associated with reduced mindfulness (Path B). The bias-corrected confidence intervals reveal that there were indirect effects of parental warmth on high mindfulness via reduced attachment anxiety and avoidance, and indirect effects of parental rejection on low mindfulness via heightened attachment anxiety and avoidance (Table 4). The direct effects of parental warmth on mindfulness remained non-significant when accounting for the mediator, indicating only indirect effects of parental warmth on mindfulness via attachment. The direct effect of parental rejection on mindfulness remained significant when controlling for the attachment mediators, indicating both direct and indirect effects. The model testing parental warmth on mindfulness via attachment accounted for 35.6% of the variance in mindfulness ($R^2 = .356$), and the model testing parental rejection on mindfulness via attachment accounted for 36.6% of the variance in mindfulness ($R^2 = .366$)¹.

3.3. Discussion

Study 2 examined whether experiences of parenting were associated with dispositional mindfulness via attachment processes in a sample of adolescent high school students. High parental rejection was associated with low dispositional mindfulness via high attachment anxiety and avoidance, and high parental warmth was associated with high dispositional mindfulness via low attachment anxiety and avoidance. These findings replicate and extend those from Study 1 by demonstrating the associations in a group of adolescent school children reporting on current experiences of parenting.

4. General discussion

Results of the two studies presented here shed light on the potential origins of individual differences in dispositional mindfulness. In Study 1 we found that recollections of high parental warmth were associated with increased mindfulness via attachment security (low attachment anxiety and avoidance), whereas recollections of parental rejection were associated with low mindfulness via insecure attachment (heightened attachment anxiety and avoidance) in an adolescent sample attending university. Overall, the role of parental rejection and attachment, and parental warmth and attachment accounted for 28.6% and 26.8% of the variance in dispositional mindfulness respectively. Study 2 replicated the above pattern of results in a sample of adolescent school children reporting on current experiences of parenting, and found that parental warmth and attachment accounted for 35.6% of the variance in mindfulness, and parental rejection and attachment accounted for 36.6% of the variance in dispositional mindfulness. In brief, results from the present two studies provide the first evidence that the origins of individual differences in dispositional mindfulness may have their roots in early childhood experiences and attachment processes.

The finding that high parental rejection was associated with attachment insecurity, and high parental warmth with secure attachment is consistent with literature indicating that individual differences in

Table 3
Coefficients from mediation analyses for Study 1.

Predictor	Path B (anxiety)	Path B (avoidance)	Path C	Path C'	Indirect (anxiety) ($CI_{95\%}$)	Indirect (avoidance) ($CI_{95\%}$)
Parental warmth	$b = -.25^{***}$	$b = -.24^{**}$	$b = .69^{**}$	$b = .23$	$b = .21 (.078 \text{ to } .444)$	$b = .25 (.079 \text{ to } .503)$
Parental rejection	$b = -.21^{**}$	$b = -.22^*$	$b = -.82^{***}$	$b = -.38$	$b = -.24 (-.454 \text{ to } -.097)$	$b = -.20 (-.422 \text{ to } -.063)$

Note. Path B = associations between the attachment mediators and mindfulness; Path C = the total effect of parenting on mindfulness; Path C' = direct effect of parenting on mindfulness when considering the attachment mediators; Indirect = indirect effect of parenting on mindfulness via attachment (anxiety and avoidance) mediators with bias-corrected confidence intervals.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

attachment are generally derived from experiences of parenting in childhood (e.g., Grossman et al., 2005; Mikulincer & Shaver, 2007). Both attachment anxiety and avoidance, in turn, were associated with low dispositional mindfulness, which is also consistent with the established association between these two constructs (Pepping et al., 2014; Pepping, O'Donovan, Zimmer-Gembeck, & Hanisch, 2015; Shaver et al., 2007). The finding of an association between parenting in childhood and mindfulness is not consistent with the only other study to have examined such associations (Walsh et al., 2009). However, as mentioned earlier, it is difficult to directly compare the present study with findings from Walsh and colleagues. To identify predictors of naturally occurring individual differences in mindfulness, it is necessary to exclude individuals who have engaged in practices designed to increase mindfulness, namely experienced mindfulness meditators. Findings from the present research suggest that the association between parenting and mindfulness may be largely indirect via attachment, which again may explain differences in findings between the two studies. The present findings therefore extend prior research by clarifying the role of parenting on mindfulness, and suggest that the origins of individual differences in mindfulness may indeed have their roots in early childhood experiences.

In both adolescent samples, parental warmth was associated with low attachment anxiety and avoidance which, in turn, predicted increased dispositional mindfulness. This suggests that caring and supportive interactions with attachment figures may facilitate the development of a secure attachment style, which is characterized by comfort with emotional intimacy and trust that others will be supportive and responsive in times of distress. This sense of felt security may allow individuals to direct attention to the present moment and engage mindfully with the environment, without worrying about potential abandonment (as in attachment anxiety) and without defending against threatening experiences (as in attachment avoidance). These findings are consistent with the theoretical proposition outlined by Ryan et al. (2007).

In both samples, experiences of parental rejection were associated with higher attachment anxiety and avoidance which, in turn, predicted low dispositional mindfulness. It seems likely that repeated interactions with caregivers that are characterized by rejection and criticism may lead to internalization of such criticism and rejection (consistent with attachment anxiety; Mikulincer & Shaver, 2007) and distrust of significant others (consistent with attachment avoidance; Mikulincer &

Shaver, 2007), and ultimately, lead to diminished capacity for mindfulness. Much evidence indicates that attachment anxiety is associated with heightened emotion and poor emotion regulation (Shaver & Mikulincer, 2004) which may impair capacity for present moment awareness. On the other hand, attachment avoidance is associated with emotional suppression and deactivation of emotion. Brown and Ryan (2003) suggest that mindlessness is often defensively motivated, such that individuals may be somewhat unwilling to maintain mindful attention to certain experiences. The finding that individuals high in attachment avoidance are lower in mindfulness is consistent with this proposition.

Interestingly, in the sample of adolescent university students (Study 1), parenting received in childhood and attachment accounted for between 26.8% and 28.6% of the variance in total mindfulness, whereas in the sample of adolescent school students (Study 2), these variables accounted for 35.6% and 36.6% of the variance in mindfulness. The sample in Study 1 was substantially older (M age = 19.34) than that in Study 2 (M age = 14.90) and it is possible that as adolescents get older, factors other than parenting and attachment may begin to impact on the development of mindfulness. Although this possibility seems likely, longitudinal research is clearly needed to definitively answer this question. Importantly, we do not propose that parenting and attachment are the only factors that may lead to individual differences in mindfulness. Indeed, there are likely other important antecedents to mindfulness capacity. In one of the only other studies to have examined predictors of dispositional mindfulness, Walsh et al. (2009) found that attentional control, trait anxiety and attachment anxiety predicted dispositional mindfulness. Further research is clearly needed to examine additional factors that predict mindfulness.

4.1. Limitations and future directions

There are limitations to acknowledge. First, in Study 1, participants were attending a large urban university, and in Study 2 participants attended a private Anglican high school. It is not clear how generalizable these findings are to populations that are less educated and lower socioeconomic status. However, the replication of findings between the two studies presented here clearly suggests that the results are not specific to one population. Second, the cross-sectional nature of the studies is a limitation as it precludes conclusions about causation, and also does not allow us to determine temporal precedence of the variables. The

Table 4
Coefficients from mediation analyses for Study 2.

Predictor	Path B (anxiety)	Path B (avoidance)	Path C	Path C'	Indirect (anxiety) ($CI_{95\%}$)	Indirect (avoidance) ($CI_{95\%}$)
Parental warmth	$b = -.50^{***}$	$b = -.34^{***}$	$b = .31$	$b = -.46$	$b = .62 (.304 \text{ to } 1.029)$	$b = .16 (.025 \text{ to } .382)$
Parental rejection	$b = -.33^{***}$	$b = -.26^{**}$	$b = -1.10^{***}$	$b = -.50^*$	$b = -.46 (-.886 \text{ to } -.090)$	$b = -.13 (-.341 \text{ to } -.024)$

Note. Path B = associations between the attachment mediators and mindfulness; Path C = the total effect of parenting on mindfulness; Path C' = direct effect of parenting on mindfulness when considering the attachment mediators; Indirect = indirect effect of parenting on mindfulness via attachment (anxiety and avoidance) mediators with bias-corrected confidence intervals.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

finding that parenting experiences were associated with attachment is certainly consistent with the longitudinal attachment literature (Mikulincer & Shaver, 2007), however, because of the cross-sectional nature of the current research, it is not possible to determine if parenting and attachment influence mindfulness. Therefore, future research should track the development of dispositional mindfulness in children longitudinally in the context of parenting and attachment. Third, the uneven gender split in Study 1 is a limitation, and it is therefore not possible to fully explore potential gender differences in the effects. However, the gender split was more even in Study 2, where the same pattern of results emerged. Further, when controlling for gender, we obtained the same pattern of results in both studies. Nonetheless, future research should examine potential gender differences in the development of dispositional mindfulness.

The use of retrospective reports of parenting received in childhood in Study 1 is a limitation (Brewin, Andrews, & Gotlib, 1993). However, perceptions of parenting are often more important than actual parenting behaviours when predicting psychosocial outcomes (e.g., Parker, 1984). Further, the findings in Study 2 where school students were asked to report on current experiences of parenting replicated results found in Study 1. Nonetheless, future research should examine actual parenting behaviour predicting dispositional mindfulness. It is also possible that perceptions of parenting could differ between maternal and paternal caregivers. In the present research, we asked participants to respond based on their perceptions of parents/caregivers as a collective unit in order to incorporate the wide range of possible caregiver arrangements in an adolescent sample. However, future research should examine whether the effects hold for both maternal and paternal caregivers.

Although the present studies demonstrated that a substantial proportion of the variance in dispositional mindfulness can be accounted for by perceptions of parenting and attachment, there are clearly other factors that impact on the development of mindfulness. Future research should investigate additional predictors of dispositional mindfulness. Finally, it needs to be acknowledged that attachment insecurity is not always associated with maladaptive outcomes (Ein-Dor, 2015; Ein-Dor, Mikulincer, Doron, & Shaver, 2010), and it is possible that aspects of attachment avoidance may relate to increased mindfulness. For example, as Walsh et al. (2009) noted although many features of avoidant attachment should relate to low mindfulness, such as thought and emotional suppression, other features may relate to increased mindfulness, such as the inhibited processing of threat and non-elaborative processing of cognition (Mikulincer & Shaver, 2004; Mikulincer & Shaver, 2007). Although the present research, and prior studies (e.g., Caldwell & Shaver, 2013; Pepping et al., 2014; Pepping, O'Donovan, Zimmer-Gembeck, & Hanisch, 2015; Shaver et al., 2007) indicate that attachment avoidance is associated with low mindfulness, the possibility remains that this association is more complex than first thought, and future research should examine whether there are aspects of avoidant attachment that relate to increased mindfulness.

4.2. Summary

Dispositional mindfulness is associated with a wide range of positive psychosocial outcomes. It is therefore important to understand the origins of naturally occurring individual differences in mindfulness. In the two studies we found that high parental warmth was associated with higher dispositional mindfulness via low attachment anxiety and avoidance, and that high parental rejection was associated with low mindfulness via heightened attachment anxiety and avoidance. Our study provides the first evidence that quality of parenting received in childhood predicts dispositional mindfulness via attachment processes, and suggests that the origins of mindfulness may have their roots in early childhood experiences.

References

- Backer-Fulghum, L. M., Patock-Peckham, J. A., King, K. M., Roufa, L., & Hagen, L. (2012). The stress-response dampening hypothesis: How self-esteem and stress act as mechanisms between negative parental bonds and alcohol-related problems in emerging adulthood. *Addictive Behaviors*, 37, 477–484. <http://dx.doi.org/10.1016/j.addbeh.2011.12.012>.
- Baer, R. A. (2003). Mindfulness training as a clinical intervention: A conceptual and empirical review. *Clinical Psychology: Science and Practice*, 10(2), 125–143. <http://dx.doi.org/10.1093/clipsy/bpg015>.
- Baer, R. A., Smith, G. T., & Allen, K. B. (2004). Assessment of mindfulness by self-report: The Kentucky inventory of mindfulness skills. *Assessment*, 11(3), 191–206. <http://dx.doi.org/10.1177/1073191104268029>.
- Baer, R. A., Smith, G. T., Lykins, E., Button, D., Krietemeyer, J., Sauer, S., et al. (2008). Construct validity of the five facet mindfulness questionnaire in meditating and nonmeditating samples. *Assessment*, 15(3), 329–342. <http://dx.doi.org/10.1177/1073191107313003>.
- Barnes, S., Brown, K. W., Krusemark, E., Campbell, W. K., & Rogge, R. D. (2007). The role of mindfulness in romantic relationship satisfaction and responses to relationship stress. *Journal of Marital and Family Therapy*, 33(4), 482–500. <http://dx.doi.org/10.1111/j.1752-0606.2007.00033.x>.
- Bowlby, J. (1969). *Attachment and loss: Vol. 1. Attachment* (2nd ed.). New York: Basic Books.
- Brewin, C. R., Andrews, B., & Gotlib, I. H. (1993). Psychopathology and early experience: A reappraisal of retrospective reports. *Psychological Bulletin*, 113(1), 82–98. <http://dx.doi.org/10.1037/0033-2909.113.1.82>.
- Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology*, 84(4), 822–848. <http://dx.doi.org/10.1037/00223514.84.4.822>.
- Brown, K. W., Ryan, R. M., & Creswell, J. D. (2007). Mindfulness: Theoretical foundations and evidence for its salutary effects. *Psychological Inquiry: An international journal for the Advancement of Psychological Theory*, 18(4), 211–237. <http://dx.doi.org/10.1080/10478400701598298>.
- Caldwell, J. D., & Shaver, P. R. (2013). Mediators of the link between attachment and mindfulness. *Interpersona*, 7(2) Available at: <http://interpersona.psychopen.eu/article/view/133/163>.
- de Bruin, E. I., Zijlstra, B. J. H., & Bögels, S. M. (2014). The meaning of mindfulness in children and adolescents: Further validation of the child and adolescent mindfulness measure (CAMM) in two independent samples in the Netherlands. *Mindfulness*, 5(4), 422–430. <http://dx.doi.org/10.1007/s12671-013-0196-8>.
- Ein-Dor, T. (2015). Attachment dispositions and human defensive behavior. *Personality and Individual Differences*, 81, 112–116. <http://dx.doi.org/10.1016/j.paid.2014.09.033>.
- Ein-Dor, T., Mikulincer, M., Doron, G., & Shaver, P. R. (2010). The attachment paradox: How can so many of us (the insecure ones) have no adaptive advantages? *Perspectives on Psychological Science*, 5, 123–141. <http://dx.doi.org/10.1177/1745691610362349>.
- Fraley, R. C. (2002). Attachment stability from infancy to adulthood: Meta-analysis and dynamic modelling of developmental mechanisms. *Personality and Social Psychology Review*, 6(2), 123–151. http://dx.doi.org/10.1207/s15327957PSPR0602_03.
- Fraley, R. C., Waller, N. G., & Brennan, K. A. (2000). An item response theory analysis of self-report measures of adult attachment. *Journal of Personality and Social Psychology*, 78(2), 350–365. <http://dx.doi.org/10.1037/0022-3515.78.2.350>.
- Germer, C. K., Siegel, R. D., & Fulton, P. R. (2005). *Mindfulness and psychotherapy*. New York, NY US: Guilford Press.
- Greco, L. A., Baer, R. A., & Smith, G. T. (2011a). Assessing mindfulness in children and adolescents: Development and validation of the Child and Adolescent Mindfulness Measure (CAMM). *Psychological Assessment*, 23(3), 606–614. <http://dx.doi.org/10.1037/a0022819>.
- Greco, L. A., Baer, R. A., & Smith, G. T. (2011b). Supplemental material for assessing mindfulness in children and adolescents: Development and validation of the Child and Adolescent Mindfulness Measure (CAMM). *Psychological Assessment*, 23(3), 606–614. <http://dx.doi.org/10.1037/a0022819.supp>.
- Grossman, K. E., Grossman, K., & Waters, E. (2005). *Attachment from infancy to adulthood. The major longitudinal studies*. New York: Guilford Press.
- Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs*, 76, 408–420. <http://dx.doi.org/10.1080/03637750903310360>.
- Janz, P., Pepping, C. A., & Halford, W. K. (2015). Individual differences in dispositional mindfulness and initial romantic attraction: A speed-dating study. *Personality and Individual Differences*, 82, 14–19. <http://dx.doi.org/10.1016/j.paid.2015.02.025>.
- Kabat-Zinn, J. (1994). *Wherever you go, there you are*. New York: Hyperion.
- Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present, and future. *Clinical Psychology: Science and Practice*, 10(2), 144–156. <http://dx.doi.org/10.1093/clipsy/bpg016>.
- Keng, S., Smoski, M. J., & Robins, C. J. (2011). Effects of mindfulness on psychological health: A review of empirical studies. *Clinical Psychology Review*, 31, 1041–1056. <http://dx.doi.org/10.1016/j.cpr.2011.04.006>.
- Lykins, E. L. B., & Baer, R. A. (2009). Psychological functioning in a sample of long-term practitioners of mindfulness meditation. *Journal of Cognitive Psychotherapy*, 23(3), 226–241. <http://dx.doi.org/10.1891/0889-8391.23.3.226>.
- Main, M. (1990). Cross-cultural studies of attachment organization: Recent studies, changing methodologies, and the concept of conditional strategies. *Human Development*, 33(1), 48–61.
- Mikulincer, M., & Shaver, P. R. (2004). Security-based self-representations in adulthood: Contents and processes. In W. S. Rholes, & J. A. Simpson (Eds.), *Adult attachment: Theory, research and clinical implications* (pp. 159–195). New York: Guilford Press.

- Mikulincer, M., & Shaver, P. R. (2007). *Attachment in adulthood: Structure, dynamics and change*. New York: Guilford Press.
- Parker, B. (1984). The measurement of pathogenic parental style and its relevance to psychiatric disorder. *Social Psychology*, 19, 75–81. <http://dx.doi.org/10.1007/BF00583818>.
- Patock-Peckham, J. A., & Morgan-Lopez, A. A. (2007). College drinking behaviors: Mediation links between parenting styles, parental bonds, depression, and alcohol problems. *Psychology of Addictive Behaviors*, 21, 297–306. <http://dx.doi.org/10.1037/0893-164X.21.3.297>.
- Patock-Peckham, J. A., & Morgan-Lopez, A. A. (2009). The gender specific mediational pathways between parenting styles, neuroticism, pathological reasons for drinking, and alcohol-related problems in emerging adulthood. *Addictive Behaviors*, 34, 312–315. <http://dx.doi.org/10.1016/j.addbeh.2008.10.017>.
- Pepping, C. A., Davis, P. J., & O'Donovan, A. (2013). Individual differences in attachment and dispositional mindfulness: The mediating role of emotion regulation. *Personality and Individual Differences*, 54(3), 453–456. <http://dx.doi.org/10.1016/j.paid.2012.10.006>.
- Pepping, C. A., O'Donovan, A., & Davis, P. (2013). The positive effects of mindfulness on self-esteem. *The Journal of Positive Psychology*, 8(5), 376–386. <http://dx.doi.org/10.1080/17439760.2013.807353>.
- Pepping, C. A., O'Donovan, A., & Davis, P. J. (2014). The differential relationship between mindfulness and attachment in experienced and inexperienced meditators. *Mindfulness*, 5(4), 392–399. <http://dx.doi.org/10.007/s12671-012-0193-3>.
- Pepping, C. A., O'Donovan, A., Zimmer-Gembeck, M. J., & Hanisch, M. (2014). Is emotion regulation the process underlying the relationship between low mindfulness and psychosocial distress? *Australian Journal of Psychology*, 66(2), 130–138. <http://dx.doi.org/10.1111/ajpy.12050>.
- Pepping, C. A., Davis, P. J., & O'Donovan, A. (2015). The association between state attachment security and state mindfulness. *PLoS ONE*, 10(3), e0116779. <http://dx.doi.org/10.1371/journal.pone.0116779>.
- Pepping, C. A., O'Donovan, A., Zimmer-Gembeck, M. J., & Hanisch, M. (2015). Individual differences in attachment and eating pathology: The mediating role of mindfulness. *Personality and Individual Differences*, 75, 24–29. <http://dx.doi.org/10.1016/j.paid.2014.10.040>.
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, 40(3), 879–891. <http://dx.doi.org/10.3758/BRM.40.3.879>.
- Ryan, R. M., Brown, K. W., & Creswell, J. D. (2007). How integrative is attachment theory? Unpacking the meaning and significance of felt security. *Psychological Inquiry*, 18, 177–182. <http://dx.doi.org/10.1080/10478400701512778>.
- Shaver, P. R., Lavy, S., Saron, C. D., & Mikulincer, M. (2007). Social foundations of the capacity for mindfulness: An attachment perspective. *Psychological Inquiry: An international Journal for the Advancement of Psychological Theory*, 18(4), 264–271. <http://dx.doi.org/10.1080/10478400701598389>.
- Shaver, P., & Mikulincer, M. (2004). Attachment in the later years: A commentary. *Attachment & Human Development*, 6(4), 451–464. <http://dx.doi.org/10.1080/1461673042000303082>.
- Skinner, E., Johnson, S., & Snyder, T. (2005). Six dimensions of parenting: A motivational model. *Parenting: Science and Practice*, 5(2), 175–235. http://dx.doi.org/10.127/s15327922par0502_3.
- Steinberg, L. (2011). *Adolescence* (9th ed.). New York: McGraw Hill.
- Van Ijzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2004). Maternal sensitivity and infant temperament in the formation of attachment. In G. Bremner, & A. Slater (Eds.), *Theories of Infant Development* (pp. 233–257). Blackwell Publishing Ltd.
- Wachs, K., & Cordova, J. V. (2007). Mindful relating: Exploring mindfulness and emotion repertoires in intimate relationships. *Journal of Marital and Family Therapy*, 33(4), 64–81. <http://dx.doi.org/10.1111/j.1752-0606.2007.00032.x>.
- Walsh, J. J., Balint, M. G., Smolira, D. R., Fredericksen, L. K., & Maden, S. (2009). Predicting individual differences in mindfulness the role of trait anxiety attachment anxiety and attentional control. *Personality and Individual Differences*, 46, 94–99. <http://dx.doi.org/10.1016/j.paid.2009.09.008>.
- Wilkinson, R. B. (2011). Measuring attachment dimensions in adolescents: Development and validation of the experiences in close relationships – Revised – General short form. *Journal of Relationships Research*, 2, 53–62. <http://dx.doi.org/10.1375/jrr.2.1.53>.