



Examining the Relationship Between Trait Rumination and Mindfulness Across Development and Risk Status

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Abstract

Objectives Rumination, the process of perseveratively dwelling on symptoms of distress and their possible causes and consequences, is a transdiagnostic risk factor for psychopathology. Mindfulness, which involves paying attention, on purpose, and nonjudgmentally, is antithetical in nature to rumination and appears effective in reducing ruminative thoughts. However, the nature of the relationships between rumination and specific aspects of mindfulness are not well understood. We aimed to investigate the relationships between rumination and specific aspects of mindfulness across three samples varying in age and risk status.

Methods Participants included 88 emerging adults (M age = 18.51, SD = .64), 161 community adolescents (M age = 12.68, SD = 1.10), and 80 adolescents selected for moderate-to-high rumination (M age = 14.01, SD = .99). All samples completed questionnaires to assess trait rumination and mindfulness. Samples 1 and 2 completed questionnaires again 3 weeks and 1 year later, respectively.

Results Linear regression models revealed that nonjudgment was the only facet that significantly predicted concurrent rumination among all samples (R^2 s = .27–.51). Higher baseline levels of nonjudgment also predicted lower levels of rumination prospectively among emerging adults (R^2 = .62) and community adolescents, along with awareness (R^2 = .33).

Conclusions Results suggest that rumination is uniquely associated with the judgment of inner experiences. Therefore, future research may investigate the utility of interventions that focus on nonjudgment for reducing rumination.

Keywords Adolescence · Mindfulness · Rumination · Nonjudgment · Development

Rumination, the cognitive process of passively and repetitively dwelling on symptoms of distress and their possible causes and consequences, is a transdiagnostic risk factor for the onset and maintenance of a wide range of psychopathology (for a review, see Watkins & Roberts, 2020). Mindfulness, which involves paying attention, on purpose, and nonjudgmentally, is conceptually antithetical to rumination and appears effective in reducing ruminative thoughts (e.g., Chiesa & Serretti, 2009; Jain et al., 2007; Kabat-Zinn, 2003). Therefore, more precisely understanding the nature of the relationship between trait rumination and mindfulness is of clinical interest to successfully prevent and treat psychopathology.

Past research investigating the relationship between trait mindfulness and rumination has mainly focused on global measures of mindfulness (i.e., total scores). However, trait mindfulness can also be conceptualized as containing five distinct facets: observing (i.e., noticing internal and external experiences), describing (i.e., labeling internal experiences), acting with awareness (i.e., attending to the present moment), nonjudgment of inner experience (i.e., taking a neutral and nonevaluative stance toward thoughts and feelings), and nonreactivity to inner experience (i.e., allowing thoughts and feelings to come and go without getting caught up or carried away by them; Baer et al., 2006). While past research demonstrates an inverse relationship between global measures of trait mindfulness and rumination (Brown & Ryan, 2003; Keune et al., 2011; Kumar et al., 2008), the distinct relationships between the individual facets of mindfulness and trait rumination are less studied.

A handful of studies have suggested that a distinct relationship may be present between the nonjudgment facet

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of mindfulness (i.e., the tendency to take a non-evaluative stance toward one's inner thoughts and feelings) and trait rumination among adult and emerging adult samples (Petrocchi & Ottaviani, 2016; Thompson et al., 2019). However, it is unclear whether the same relationship may be present among adolescents. As adolescence is a critical stage in development during which the relationship between rumination and psychopathology intensifies (Jose & Brown, 2008; Nolen-Hoeksema et al., 2007; Rood et al., 2009), understanding the association between the individual facets of trait mindfulness and trait rumination during this developmental period is important for both the prevention and the treatment of psychopathology. Only one prior study has examined these relationships prospectively (Petrocchi & Ottaviani, 2016); therefore, it is also unclear whether the association between nonjudgment and rumination is predictive over time among adolescents.

In contrast to mindfulness, which emphasizes an open, nonjudgmental, and intentional awareness to the present moment, rumination is consuming of one's attention and involves dwelling on symptoms of distress and their possible causes and consequences (Nolen-Hoeksema, 1991; Nolen-Hoeksema et al., 2008). Rumination can be measured as a state (i.e., momentary engagement) or as a trait-like response style (i.e., a tendency to habitually engage in rumination in response to distress; Nolen-Hoeksema, 1991). Ruminative thoughts can take on a critical tone, such as focusing on past shortcomings or failures and past research demonstrates that a ruminative response style has been correlated with other maladaptive cognitive styles (e.g., self-criticism and hopelessness; Nolen-Hoeksema et al., 2008). However, rumination is a mode of responding to distress characterized by its repetitive and passive nature, rather than by the specific content of one's thoughts (Nolen-Hoeksema, 1991; Nolen-Hoeksema, et al., 2008).

Rumination plays a significant role in the etiology and maintenance of a wide range of psychopathology, including depression, anxiety, post-traumatic stress disorder, drug misuse, and eating disorders (for comprehensive reviews, see Aldao et al., 2010; Nolen-Hoeksema et al., 2008; Watkins & Roberts, 2020). This relationship is especially robust for the onset and maintenance of depression, as individuals who habitually respond to distress with rumination are not only more likely to experience the onset of a depressive episode (Just & Alloy, 1997; Lyubomirsky & Nolen-Hoeksema, 1993), but also more likely to experience depressive episodes that are longer in duration and more difficult to recover from (Nolen-Hoeksema, 1991; Nolen-Hoeksema et al., 2008). Though anyone with high levels of trait rumination is more likely to experience the onset of a depressive episode, women are twice as likely to experience the onset of a depressive episode compared to men (Kuehner, 2003) and report higher levels of rumination

(Nolen-Hoeksema et al., 1999). In past research, rumination appears to account for the gender gap in rates of depression between men and women (Nolen-Hoeksema et al., 1999).

Adolescence is an especially vulnerable developmental period for both the emergence and consolidation of a ruminative response style and the onset of psychopathology (Kessler et al., 2005; Shaw et al., 2019). While momentary self-reflection following a stressor is normative among adolescents (Hilt & Pollak, 2013), adolescents who ruminate habitually in response to distress are significantly more vulnerable to the onset and maintenance of a wide range of psychopathology (Abela & Hankin, 2011; Hilt et al., 2010; Nolen-Hoeksema et al., 2007; Schwartz & Koenig, 1996). In past research, rumination has been proposed as a type of mental habit, which may consolidate as a stable and trait-like response style after the repeated pairing of negative affect with state rumination (Watkins & Nolen-Hoeksema, 2014). The ability to ruminate is present in children as young as eight (Abela et al., 2002); however, older adolescents tend to ruminate more than younger adolescents (Hankin, 2008; Jose & Brown, 2008), suggesting that early adolescence may be an especially critical stage for the consolidation of a ruminative response style (Shaw et al., 2019). Past research suggests that a combination of genetic and cognitive vulnerabilities for rumination, in addition to exposure to chronically stressful environmental factors (e.g., maltreatment, controlling parenting styles) that may prompt rumination, contributes to the emergence and consolidation of a ruminative response style over time (Shaw et al., 2019).

As in adults, rumination has a particularly robust relationship with depression among adolescents. In past research, rumination among adolescents has been associated with a greater likelihood of a past major depressive episode, a greater chance of experiencing the onset of a depressive episode, and a greater chance of experience a future depressive episode which is longer in duration (Abela & Hankin, 2011). Gender differences in rumination (i.e., girls reporting higher levels than boys) appear to emerge around age 12, with gender differences in depression following at age 13 (Jose & Brown, 2008). Mirroring research among adult samples, rumination has also been shown to mediate the relationship between gender and depression among adolescents (Hilt et al., 2010; Jose & Brown, 2008). In addition to the robust relationship between rumination and depression, rumination also predicts the onset of anxiety, disordered eating, and substance misuse among adolescents (Nolen-Hoeksema, et al., 2007; Schwartz & Keonig, 1996) and has been identified as an important risk factor for both nonsuicidal self-injury (e.g., Barrocas et al., 2014; Hilt et al., 2008) and suicidal ideation (e.g., Miranda & Nolen-Hoeksema, 2007; Smith et al., 2006). As half of all lifetime cases of psychopathology begin before the age of 14, and 75% of cases emerge before the age of 24 (Kessler et al., 2005), reducing trait rumination during

adolescence is critical for both the prevention and treatment of psychopathology.

Clinicians and researchers have turned to mindfulness in recent years as a tool to combat a wide range of psychopathology, and rumination appears to be an important mechanism in its effects. For example, mindfulness techniques are a foundational component in mindfulness-based cognitive therapy (MBCT) for depression, a therapy that was developed to prevent the relapse of depressive symptoms in recovered recurrently depressed individuals (Teasdale et al., 2001). Past research demonstrates that MBCT is most effective in preventing internally provoked relapses among individuals with three or more previous episodes and least effective in preventing relapses preceded by significant life events among those with only two prior depressive episodes (Ma & Teasdale, 2004; Teasdale et al., 2001). These results suggest that the effects of MBCT on relapse may be mediated by reductions in negative cognitive processes such as rumination, which are more salient in the onset of autonomously provoked depressive episodes (Ma & Teasdale, 2004; Teasdale et al., 2001). Further, research among adults demonstrates mindfulness interventions to be effective in decreasing stress and negative affect, and decreased rumination appears to be a mediator of these effects (for a review, see Chiesa & Serretti, 2009). Together, these results suggest that the effects of mindfulness on psychopathology may be mediated by reductions in rumination. However, because mindfulness is multi-faceted, it would be helpful to know which aspects are particularly related to rumination, so that a more targeted treatment approach could be taken.

One of the most widely used measures of mindfulness is the Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006), which conceptualizes mindfulness as including at least five components (i.e., observing, describing, acting with awareness, nonjudging of inner experience, and nonreactivity to inner experience). Two studies have investigated the distinct relationships between facets of mindfulness and rumination among adult and emerging adult samples (Petrocchi & Ottaviani, 2016; Thompson et al., 2019). In one study, emerging adults completed the FFMQ and measures of rumination and depression at baseline and 2 years later (Petrocchi & Ottaviani, 2016). Results demonstrated that nonjudgment uniquely predicted rumination at follow-up. Baseline nonjudgment also predicted changes in depressive symptoms 2 years later, and importantly, rumination measured at follow-up significantly mediated the relationship between nonjudgment at baseline and depressive symptoms at follow-up. In another study, researchers demonstrated that nonjudgment was distinctly inversely related to concurrent trait rumination (Thompson et al., 2019). Specifically, less nonjudgment was associated with greater rumination in one emerging

adult sample and two adult samples when controlling for measures of general perseverative thought, worry, and the other facets of mindfulness (Thompson et al., 2019). Together, these results suggest that nonjudgment may be uniquely implicated in the relationship between trait mindfulness and trait rumination among adults and emerging adults.

Less research exists on the relationship between trait mindfulness and trait rumination among adolescents, but a handful of studies suggest that both brief (Hilt & Pollak, 2012) and prolonged (Ames et al., 2014; Mendelson et al., 2010; van de Weijer-Bergsma et al., 2014) exposure to mindfulness may be effective in reducing rumination among children and adolescents. However, as past research has not yet investigated the relationship between individual mindfulness facets and trait rumination, it is unclear which aspects of mindfulness may be contributing to the reduction in rumination among adolescents.

While past research has not yet examined these relationships among mindfulness and trait rumination in adolescents, at least one study has investigated the relationship between the facets of mindfulness and state rumination among adolescents (Ciesla et al., 2012). In this study, baseline nonreactivity and nonjudgment scores were associated with lower levels of self-reported daily dysphoria. Low levels of nonjudgment and nonreactivity predicted state rumination in the presence of stress, while high levels of nonjudgment and nonreactivity acted as a buffer against state rumination when stress was present. Lastly, daily rumination mediated the effect of stress on dysphoria for those with low nonjudgment, but not for individuals with high levels of nonjudgment (Ciesla et al., 2012). These results suggest that low levels of nonjudgment and nonreactivity are particularly salient in the onset of dysphoria and engagement in state rumination, especially in the presence of stress among adolescents. We might expect a similar relationship to be present with trait rumination, but this has not been previously examined.

The goal of the present study was to further understand the nature of the relationships between the facets of mindfulness and trait rumination across three samples ranging in development and risk status. We hypothesized that the nonjudgment facet of mindfulness would be associated with concurrent trait rumination, at least among an unselected sample of emerging adults. Additionally, we explored whether the nonjudgment facet of mindfulness would also be negatively associated with concurrent trait rumination among a community sample of adolescents and a sample of adolescents selected for moderate-to-high rumination. Finally, we hypothesized that higher levels of trait nonjudgment at baseline would predict decreased levels of rumination at follow-up for both community adolescents and emerging adults.

Method

Participants

Sample 1

Participants were 88 first-year undergraduate students ages 18–21 years old (M age = 18.51, SD = 0.64) recruited from a small Midwestern university from 2017 to 2018. They identified as 65.9% female, 29.6% male, and 4.5% nonbinary. Sixty-seven percent identified as White, 20.5% Asian, and 9.1% African American, and 3.4% chose not to answer. Ethnic composition was 88.6% Non-Hispanic and 11.4% Hispanic.

A subsample of 37 participants were randomly assigned to an assessment-only control condition and re-assessed at 3 weeks (64.9% female, 29.7% male, 5.4% nonbinary; 70.3% White, 16.2% Asian, 10.8% African American, and 2.7% chose not to answer; 91.9% Non-Hispanic and 8.1% Hispanic). There were no significant differences between the follow-up group and the full sample on demographic characteristics and most study variables. However, participants in the follow-up group had lower awareness scores $t(87) = 2.8$, $p = 0.006$ and higher rumination scores $t(87) = -2.3$, $p = 0.019$ at baseline compared to the larger sample.

Sample 2

Participants were 161 community adolescents ages 10–15 years old (M age = 12.68, SD = 1.01) recruited from a moderately sized Midwestern community from 2012 to 2013. The sample was 52.2% boys and 47.8% girls. Parents reported on race (88.2% White, 1.9% African American, 1.9% Native American, 0.6% Asian, 3.7% other, and 3.7% did not answer) and ethnicity (82.6% Non-Hispanic, 5.0% Hispanic, and 12.4% chose not to answer).

Seventy-nine participants completed a follow-up assessment 1 year later (M age = 12.72, SD = 1.12; 52.5% boys and 47.5% girls; 96.2% white, 2.5% others, and 1.3% did not answer; 82.3% Non-Hispanic, 3.8% Hispanic, and 13.9% chose not to answer). Participants who completed the follow-up assessment did not significantly differ from the larger sample in demographics or study variables.

Sample 3

Participants were 80 adolescents ages 12–15 (M age = 14.01 years, SD = 0.99) recruited in 2018–2019 from the same community as Sample 2. Participants were 53.8% boys, 45.0% girls, and 1.2% chose not to answer. Parents reported on race and ethnicity; 86.25% White, 2.5% Native

American, 1.25% Black, 1.25% multiracial 8.75% chose not to answer; 3.75% Hispanic, 93.75% non-Hispanic, and 2.5% chose not to answer.

Procedure

Sample 1

First-year students were recruited from a small Midwestern university as part of a study “on emotions using a mobile app.” They were recruited with flyers, in-class advertisements, and in-person advertisements at events intended for first-year students. During a visit to the lab, all participants provided informed consent, completed baseline questionnaires, and were randomly assigned to an experimental or control condition. Participants were emailed a link to an online follow-up survey 3 weeks later. Data for the present investigation were collected at baseline. Additionally, we examined the prospective relationship between the facets of trait mindfulness and trait rumination in the subsample of participants that were randomly assigned to an assessment-only control condition and completed the 3-week follow-up. Participants were compensated with \$5 for the completion of the baseline survey and \$10 for the completion of the 3-week follow-up survey.

Sample 2

Adolescents were recruited from a moderately sized Midwestern community from 2012 to 2013 through flyers, letters sent in the mail, and by word of mouth, for a study on youth emotion. Additionally, participants were recruited at local organizations (e.g., summer camps, churches, and after school programs). All adolescent participants completed paper questionnaires, and parents and adolescents provided informed consent and assent, respectively. During the lab visit, participants completed various tasks unrelated to the present investigation and were paid \$15 plus a prize (for full details, see Vahlsing et al., 2015). Seventy-nine participants completed a follow-up assessment 1 year later and were compensated with \$5.

Sample 3

Ruminative adolescents were recruited in the same community as Sample 2 through letters sent in the mail and word-of-mouth. Participants were part of a larger study investigating the effects of a mindfulness intervention. Adolescents were eligible to participate in the study if they were between the ages of 12 and 15 and reported moderate-to-severe levels of trait rumination during an initial phone screen. More specifically, participants were eligible if their average score, based on two questions from the Children’s Response Styles

Questionnaire (CRSQ; Abela et al., 2002), indicated that they ruminate “sometimes,” “often,” or “always.” Based on these criteria, 14 adolescents were not eligible to participate. During the initial visit, parents/guardians and adolescents provided informed consent/assent and completed baseline questionnaires. Participants were asked to use a mindfulness mobile app (i.e., CARE App) three times a day for 3 weeks. After the intervention period, parents and adolescents completed follow-up surveys at four time points. However, only baseline data were included in the present investigation. For full details, see Hilt and Swords (2021).

Measures

Trait Rumination

For Sample 1, we used the ruminative response scale (RRS) from the Response Styles Questionnaire (RSQ; Nolen-Hoeksema & Morrow, 1991) to assess trait rumination. This 22-item scale assesses an individual’s tendency to ruminate in response to distress on a 4-point Likert scale (1 = *almost never*, 2 = *sometimes*, 3 = *often*, 4 = *almost always*). Sample items include “Think ‘I won’t be able to concentrate if I keep feeling this way’” and “Think ‘why can’t I get going?’” Past research has demonstrated that the RRS has good internal consistency and moderate test–retest reliability among college samples (Roelofs et al., 2006). In this sample, the RRS showed excellent reliability ($\alpha = 0.93$). For Samples 2 and 3, we assessed rumination using the rumination subscale of the Children’s Response Styles Questionnaire (CRSQ; Abela et al., 2002; Nolen-Hoeksema, 1991). The rumination subscale of the CRSQ consists of 13-items that assess a child’s tendency to respond to feelings of sadness with rumination on a 4-point Likert scale (0 = *almost never*, 1 = *sometimes*, 2 = *often*, 3 = *almost always*). It is adapted from the RRS, and sample items include “Why can’t I handle things better” and “Think about a recent situation, wishing it had gone better.” Past research has demonstrated reliability and validity among adolescents (Abela et al., 2002). The rumination subscale of the CRSQ demonstrated good reliability in this study (Sample 2 $\alpha = 0.90$, Sample 3 $\alpha = 0.89$). For both the adult and child versions of the rumination scales, we modified directions to ask participants to report on what they do when they feel sad or stressed, in line with current conceptualizations (Nolen-Hoeksema et al., 2008; Shaw et al., 2019).

Trait Mindfulness

Trait mindfulness was assessed using the Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006). The FFMQ is a 39-item self-report questionnaire that identifies five distinct dimensions of mindfulness. These five facets include: observing (e.g., “I notice the smells and aromas of things”),

describing (e.g., “I am good at finding words to describe my feelings”), acting with awareness (e.g., “I find myself doing things without paying attention,” reverse scored), nonjudgment of inner experiences (e.g., “I think some of my emotions are bad or inappropriate and I should not feel them,” reverse scored), and nonreactivity to inner experience (e.g., “I perceive my feelings and emotions without having to react to them”). Items are assessed on a 5-point Likert-scale (1 = *never or very rarely true* to 5 = *very often or always true*). Past research has demonstrated that the FFMQ is both reliable and valid in adult and emerging adult samples (Baer et al., 2006, 2008). Several studies have used the FFMQ to measure dispositional mindfulness in adolescent samples (e.g., Ciesla et al., 2012; Galla et al., 2020), and a slightly modified version of the FFMQ has shown acceptable internal consistency, test–retest reliability, and convergent and discriminant validity in a sample of adolescents (Royuela-Colomer & Calvete, 2016). However, the mindfulness facet of observing tends to capture maladaptive self-focus rather than mindful observing (Baer et al., 2008). Therefore, in line with past research, we did not include the observing facet in our analyses (Thompson et al., 2019). In all samples, the FFMQ facets demonstrated good reliability ($\alpha \geq 0.80$).

Data Analyses

Prior to conducting analyses, we ensured that all assumptions for hierarchical linear regression were met. Through hierarchical linear regression models, we examined whether concurrent trait mindfulness (i.e., describing, acting with awareness, nonjudgment, and nonreactivity to inner experience) would predict concurrent trait rumination. Due to past research suggesting that rumination is more prevalent in girls and older adolescents (Jose & Brown, 2008; Rood et al., 2009), we controlled for age and gender. In the model, age and gender were entered into the first step, while the four facets of mindfulness were entered on the second step. Similarly, to examine whether trait mindfulness at baseline would predict subsequent rumination, we conducted hierarchical linear regression models, controlling for baseline rumination, age, and gender on the first step and entering facets of mindfulness on the second step.

Results

Descriptive Statistics

Prior to hypothesis testing, we examined means and standard deviations as well as the bivariate associations among variables. In Sample 1, baseline and follow-up trait rumination were negatively associated with all facets of trait mindfulness at both time points. Additionally, most facets

Table 1 Means, standard deviations, and correlations for unselected college sample

Variables	1	2	3	4	5	6	7	8	9	10
T1 RRS	-									
T1 Describe	-.48**	-								
T1 Awareness	-.48**	.51**	-							
T1 Nonjudgment	-.63**	.37**	.43**	-						
T1 Nonreactivity	-.33**	.53**	.20	.13	-					
T2 RRS	.70**	-.32	-.40*	-.55**	-.34*	-				
T2 Describe	-.41*	.81**	.57**	.24	.61**	-.36*	-			
T2 Awareness	-.47**	.60**	.81**	.35*	.30	-.57**	.49**	-		
T2 Nonjudgment	-.43**	.34*	.11	.82**	.19	-.60**	.26	.27	-	
T2 Nonreactivity	-.30	.59**	.39*	.18	.83**	-.43**	.55**	.29	.29	-
M	50.36	26.18	25.74	24.49	19.48	50.05	25.03	23.59	23.38	18.78
SD	14.64	6.82	7.32	8.46	5.76	13.99	7.17	6.03	6.58	5.08

Note. Rumination=(RRS) ruminative response scale score. T1 measures collected at baseline for all participants (n=88). T2 measures were collected 3 weeks after baseline (n=37)

* p < .05
 ** p < .01

of mindfulness were positively associated with one another (see Table 1). Samples 2 and 3 (the adolescent samples) showed a similar pattern to Sample 1 except that rumination and nonreactivity were not correlated (see Tables 2 and 3).

Concurrent Analyses

We first tested the hypothesis that mindfulness (specifically, nonjudgment) would be inversely related to rumination, concurrently. For all samples, only the mindfulness facet of nonjudgment was a significant predictor of trait rumination (see Table 4). Results suggest that trait rumination is uniquely associated with lower trait nonjudgment of inner experiences concurrently, across all three samples.

Prospective Analyses

Next, we tested the hypothesis that trait mindfulness (specifically, nonjudgment) would predict lower future rumination, controlling for baseline rumination, age, and gender in the two samples with prospective data. In both Samples 1 and 2, the hierarchical linear regression revealed a significant negative relationship between baseline nonjudgment and trait rumination measured at follow-up (see Table 5). In Sample 2, awareness was also a significant predictor of trait rumination at follow-up. These results reveal that higher levels of nonjudgment were associated with reductions in rumination over time among both emerging adults and adolescents.

Table 2 Means, standard deviations, and correlations for community adolescents

Variables	1	2	3	4	5	6	7	8	9	10
T1 CRSQ	-									
T1 Describe	-.18*	-								
T1 Awareness	-.30**	.31**	-							
T1 Nonjudgment	-.54**	.24**	.33**	-						
T1 Nonreactivity	-.10	.28**	.06	.03	-					
T2 CRSQ	.51**	-.16	-.36**	-.41**	-.16	-				
T2 Describe	-.09	.36**	.27*	.16	.21	-.23*	-			
T2 Awareness	-.12	.25*	.53**	.15	.20	-.41**	.42**	-		
T2 Nonjudgment	-.34**	.07	.26*	.43**	-.06	-.61**	.28**	.32**	-	
T2 Nonreactivity	-.06	.17	.16	.00	.43**	-.04	.30**	.16	-.11	-
M	11.69	24.94	25.63	29.31	20.29	11.22	26.08	26.67	29.29	19.94
SD	7.77	5.37	5.86	6.25	4.71	7.40	5.34	6.08	6.08	5.00

Note. CRSQ=Rumination subscale from the Children’s Response Styles Questionnaire. T1 measures collected at baseline for all participants (n=160). T2 measures were collected 1 year later (n=79)

* p < .05
 ** p < .01

Table 3 Means, standard deviations, and correlations for high-ruminating (n = 80) adolescents

Variables	1	2	3	4	5
1. T1 CRSQ	-				
2. Describe	-.22*	-			
3. Awareness	-.38**	.25*	-		
4. Nonjudgment	-.57**	.17	.39**	-	
5. Nonreactivity	.09	.40**	-.012	-.14	-
M	13.79	24.25	25.79	29.91	18.96
SD	7.97	5.91	5.91	6.16	5.14

Note. CRSQ=Rumination subscale from the Children’s Response Styles Questionnaire

* $p < .05$

** $p < .01$

Furthermore, higher awareness was also associated with reduced rumination over time among adolescents only. Finally, neither age nor gender were significant in any of the models.

Discussion

The present study investigated the relationships between individual facets of mindfulness and trait rumination across three samples varying in age and risk status. Our findings suggest that trait rumination, a transdiagnostic risk factor for psychopathology, is negatively associated with the nonjudgment of inner experiences, concurrently across all samples. Further, higher levels of nonjudgment prospectively predicted lower levels of rumination in both a community adolescent and emerging adult sample. Among community adolescents, higher levels of awareness also predicted lower levels of rumination at follow-up. Neither age nor gender were significant predictors in any of the models. These findings provide insight into the nature of the relationship between trait mindfulness and trait rumination and suggest that mindfulness interventions that focus specifically on

the nonjudgment of inner experiences may be particularly effective in reducing rumination among both adolescents and emerging adults.

Our findings extend previous research in several important ways. While past research has demonstrated an inverse relationship between trait mindfulness and trait rumination, the exact nature of the relationships between the individual facets of mindfulness and trait rumination is less studied, particularly among adolescents. Therefore, our study helps clarify the nature of the relationships between the mindfulness facets and trait rumination among adolescents. These results complement the findings of a previous study conducted in a sample of adolescents, which found a relationship between nonjudgment and state rumination (Ciesla et al., 2012); our study extends this relationship to trait rumination. Taken together, these results suggest that adolescents that take a less evaluative and negative stance towards their internal experiences are less likely to use rumination as both a momentary or stable response to stress and sadness.

Studies investigating the relationships between facets of mindfulness and rumination among emerging adults and adults are also sparse. However, one study found that lower levels of nonjudgment were associated with greater concurrent rumination when controlling for perseverative thought, worry, and other facets of mindfulness across two adult samples and one emerging adult sample (Thompson et al., 2019). Among another sample of emerging adults, researchers found that rumination mediated the relationship between baseline levels of nonjudgment and decreased depressive symptoms 2 years later (Petrocchi & Ottaviani, 2016). Results from the present study complement these findings, as our study demonstrated that nonjudgment was inversely related to concurrent rumination among emerging adults and predictive of lower rumination 3 weeks later.

It is interesting to explore why the negative association between trait nonjudgment and trait rumination emerged across all three samples. While ruminative and judgmental thoughts share some similarities, in that both may be negative in valance, ruminative thoughts differ in time-orientation and are more abstract and overgeneralized (e.g., “why

Table 4 Regression analysis summary for FFMQ variables predicting concurrent rumination in three samples

Predictor	College sample				Community adolescents				High-ruminating adolescents			
	R ²	F	β	p	R ²	F	β	p	R ²	F	β	p
Step 1	.04	1.84		.165	.02	1.20		.305	.06	2.45		.093
Age			.09	.068			-.01	.900			.22	.360
Gender			.20	.391			.13	.134			.10	.055
Step 2	.51	14.20		.000	.27	8.47		.000	.42	8.55		.000
Describe			-.14	.213			.06	.456			-.15	.143
Awareness			-.17	.074			-.09	.256			-.12	.250
Nonjudgment			-.48	.000			-.47	.000			-.48	.000
Nonreactivity			-.15	.116			-.08	.309			.10	.335

Table 5 Regression analysis summary for FFMQ variables prospectively predicting rumination among two unselected samples

Predictor	College sample					Community adolescents				
	R^2	ΔR^2	F	β	p	R^2	ΔR^2	F	β	p
Step 1	.52	.48	11.92		.000	.22	.19	7.24		.000
Age				.11	.382				.37	.713
Gender				.14	.277				.06	.536
T1 Rumination				.67	.000				.32	.000
Step 2	.62	.53	6.77		.000	.33	.26	5.03		.000
Describe				.20	.393				.03	.815
Awareness				-.14	.395				-.24	.041
Nonjudgment				-.34	.043				-.25	.025
Nonreactivity				-.35	.063				-.06	.580

do I always respond this way?”). In contrast, the nonjudgment facet of mindfulness describes the extent to which an individual evaluates specific thoughts and feelings as either good or bad (e.g., “that thought was unkind”). While rumination is more essentially characterized by passiveness, repetitiveness, and overgeneralized thinking, rather than by a specifically evaluative or nonevaluative stance, it is possible, but not necessary, for rumination to include an evaluative component. Similarly, it is important to recognize that judgmental thoughts are not inherently ruminative. However, our results emphasize that a less evaluative mindset may be important for reducing trait rumination. As rumination is a repetitive process, and theories suggest that those who ruminate get stuck due to difficulty in disengaging from negative self-relevant information (Koster et al., 2011; Shaw et al., 2019), learning to approach thoughts and feelings in a more neutral manner may offer a way to disengage from this process.

In addition to nonjudgment, acting with awareness emerged as a predictor of change in rumination for the adolescent community sample. In contrast to rumination, which typically involves focusing on the past (Nolen-Hoeksema et al., 2008), the mindfulness facet of awareness emphasizes attention to the present moment (Baer et al., 2006). Our findings demonstrate that adolescents who reported greater present moment awareness at baseline ruminated less 1 year later. However, as this facet was only associated with rumination in one sample, it may not be as robust of a predictor as nonjudgment.

In addition to examining the significant relationships that emerged in our study, it is also fascinating to explore the relationships that did not emerge. The mindfulness facet of nonreactivity to inner experiences, for example, was not significant in any of our models. As measured by the FFMQ, this facet of mindfulness measures one’s ability to allow thoughts and feelings to come and go without getting caught up or carried away by them. These results are somewhat surprising as those who ruminate often report that rumination can feel uncontrollable (e.g., Papageorgiou & Wells,

2001, 2003) and trait rumination has been associated with impaired attentional disengagement from negative self-referential information (Koster et al., 2011). Further, a previous study among adolescents found that adolescents with low levels of nonreactivity reported greater engagement in state rumination in the presence of stress (Ciesla et al., 2012). While we did not find a relationship between rumination and nonreactivity at the trait-level, it would be interesting for future research to further investigate the relationships between trait-mindfulness and engagement in state rumination in adolescent samples, to clarify these relationships further in samples ranging across development and risk status.

Limitations and Future Research Directions

It is important to interpret the findings within their limitations. Sample sizes for the prospective analyses are fairly small. Mindfulness was also assessed through self-report; thus it captured individuals’ perception of their own trait mindfulness. Past research suggests that limitations of assessing mindfulness through self-report measures, such as the FFMQ, include bias resulting from an individual’s familiarity with mindfulness-related concepts (Grossman & Van Dam, 2011). As adolescents likely have less experience with mindfulness than adults, this may be particularly true for some of the participants included in the present study. Further, as all constructs in the present study were assessed through the same method (i.e., self-report measures), correlations might have arisen, in part, because of the similar method used to assess multiple constructs (Podsakoff et al., 2012). Lastly, mindfulness was not manipulated in the present study. Therefore, future directions could include investigating the role of nonjudgment in a study that manipulates mindfulness (e.g., a randomized trial of a mindfulness intervention). Given these limitations, it will be important for future research to further explore the relationship between the facets of mindfulness and trait rumination in other adolescent samples to determine whether the results from the present study may replicate.

As research on this topic is still emerging, especially among adolescent samples, a wide range of research questions remain unanswered. For example, in at least one clinical trial among a sample of adults, treatment with MBCT was associated with both reductions in rumination and increases in nonjudgment (van Aalderen et al., 2012); however, the mechanism of mindfulness' effect on rumination remains generally speculative, especially in adolescent samples. It would be interesting for future research to further examine whether nonjudgment increases following mindfulness-based interventions and whether this, in turn, reduces rumination using at least three time points, to understand the direction of effects more fully. Similarly, it would be interesting to investigate whether other therapies that target rumination, such as *Rumination Focused Cognitive Behavioral Therapy* (RFCBT; Watkins, 2015), may also reduce rumination through nonjudgment. Although RFCBT is not categorized as a mindfulness-based therapy, therapists guide clients to replace ruminative thinking with concrete present-moment thinking and self-compassion. Increasing nonjudgment could be a mechanism of the reductions in rumination and psychopathology that have been documented in both adult and adolescent samples (Topper et al., 2017), but this has not yet been tested. Additionally, evidence-based mindfulness interventions typically involve weeks of intensive mindfulness practice, which may be difficult for adolescents. Future research could investigate whether brief mindfulness interventions focusing on cultivating nonjudgment may be a more efficient way to reduce trait rumination among adolescents. Finally, a limited amount of research suggests that girls and women may benefit more from certain forms of mindfulness-based intervention than boys and men (Kang et al., 2018; Rojiani et al., 2017). While this remains understudied among adolescents, exploring gender differences as they relate to the mindfulness facets may be beneficial in order to create more effective mindfulness-based interventions.

Author Contribution CMS designed the hypotheses for the present investigation, collected data for Sample 3, conducted the analyses, and wrote the paper. LMH designed the three studies that contributed to the investigation, collected data for Samples 1 and 2, and collaborated in the writing and editing of the final manuscript.

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Declarations

Ethics Approval All studies have been approved by the Lawrence University Institutional Review Board and have been performed in accordance with the ethical standards in the 1964 Declaration of Helsinki and its later amendments.

Consent to Participate All participants gave informed consent prior to their inclusion in the study. In studies in which adolescents were enrolled, parents gave informed consent and adolescents provided written and verbal assent prior to enrollment in the study. Details that may have disclosed the identity of subjects have been removed.

Conflict of Interest The authors declare no competing interests.

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