



# The relationship between trait mindfulness, personality and psychological distress: A revised reinforcement sensitivity theory perspective



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## ABSTRACT

Interest in the application of mindfulness-based intervention for the treatment of psychological disorders and promotion of wellbeing has grown exponentially in recent years. Mindfulness-based interventions have been found to be beneficial for treatment of various forms of psychopathology as well as improve psychological wellbeing and enhance physical health. Little research has investigated for whom and under what conditions training people to use mindfulness-based therapeutic techniques is most effective. Recent studies have found evidence that individual differences in personality traits are associated with mindfulness. For example, neuroticism has been found to be negatively associated with mindfulness. These associations raise the possibility that individual differences in personality may potentially moderate the effectiveness of mindfulness-based interventions. In the present study we draw on Gray's revised Reinforcement Sensitivity Theory (r-RST) to examine relationships between personality traits, mindfulness and psychological distress. We found that the Flight, Fight, Freeze system mediated the relationship between trait mindfulness and psychological distress, while trait mindfulness moderated the relationship between the Flight, Fight, Freeze system and psychological distress. Both results are consistent with the suggestion that acquiring the skills from learning and practicing mindfulness techniques is potentially useful, particularly for threat-sensitive individuals with low to moderate levels of trait mindfulness.

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## 1. Introduction

Interest in the Eastern philosophical concept of mindfulness for the treatment of psychological disorders and promotion of wellbeing is rapidly increasing. A large body of research has documented the effectiveness of mindfulness-based interventions for a range of clinical disorders (Bowen et al., 2014; Khoury et al., 2013; Masuda & Hill, 2013). In non-clinical samples, mindfulness-based interventions have been associated with improved attention and memory (Chiesa, Calati, & Serretti, 2011), psychological wellbeing and physical health (Carlson, Speca, Faris, & Patel, 2007; Davidson et al., 2003; Keng, Smoski, & Robins, 2011). Mindfulness appears beneficial for individuals across the lifespan from young children (Flook, Goldberg, Pinger, & Davidson, 2015) to older adults (Moynihan et al., 2013).

Despite this large body of research, little research has investigated for whom, and under what conditions, mindfulness-based therapeutic techniques is most effective. Keng et al. (2011) reviewed preliminary evidence suggesting that the effectiveness of mindfulness-based

interventions may vary as a function of individual differences. For example, one study found that participants who reported an insecure attachment style derived greater benefit from the Mindfulness-based Stress Reduction (MBSR) program than participants with a secure attachment (Cordon, Brown, & Gibson, 2009). In another study mindfulness moderated the effects of MBSR, with higher mindfulness resulting in greater improvements (Shapiro, Brown, Thoresen, & Plante, 2011).

Recent studies have found associations between mindfulness and personality traits. For example, neuroticism and impulsivity were found to be negatively associated, and conscientiousness positively associated, with mindfulness (Fetterman, Robinson, Ode, & Gordon, 2010; Giluk, 2009; Lattimore, Fisher, & Malinowski, 2011). While suggesting that personality may moderate the effectiveness of mindfulness-based interventions, these studies were not theoretically-derived by established models of personality. In the present study we draw on Gray's revised Reinforcement Sensitivity Theory (r-RST) as the three biologically-based sub-systems postulated by r-RST have been found to be associated with both psychological distress and wellbeing (Erdle & Rushton, 2010; Harnett, Loxton, & Jackson, 2013; Jovanovic, 2011). The first of the r-RST sub-systems – the Behavioral Approach System (BAS) – mediates behavioral approach towards signals of reward. High BAS is associated with positive affect, while

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low levels of BAS activity are associated with depression (Harnett et al., 2013). The second sub-system – the Flight, Fight, Freeze System (FFFS) – mediates the behavioral avoidance of punishment or threat. FFFS activity elicits fear responses and is an aetiological factor in phobia and panic disorders (Gray & McNaughton, 2000). The third sub-system – the Behavioral Inhibition System (BIS) – operates to resolve conflict when both the BAS and FFFS systems are activated; as would occur when signals of possible reward coexist with possible threat. BIS leads behaviorally to a cautious approach response in order to resolve the conflict. The subjective experience of BIS activation is anxiety and thus implicated in the etiology of anxiety disorders.

A small number of studies have investigated the relationship between mindfulness and psychological distress and wellbeing from the perspective of RST. These studies have either viewed personality traits as a mediator of the relationship between mindfulness and psychological functioning (wellbeing and psychological distress) or viewed trait mindfulness as a moderator of the relationship between personality and psychological functioning. Sauer, Walach, and Kohls (2011) pointed out that the Buddhist concept of “sankhara” refers to an aversion to the present state of affairs triggering defensive emotional and behavioral responses (see De Silva, 2001). The authors noted the similarity between the sankhara process and the function of the BIS, and argued that mindfulness can be seen as a mechanism to weaken the sankhara process, or in r-RST terms, BIS activity. Their data confirmed BIS (conceptualized as a combination of the BIS and FFS in line with the original RST, o-RST; Gray, 1982) mediated the relationship between mindfulness and wellbeing in a non-clinical sample. Further, a sub-group of experienced mindfulness practitioners reported higher levels of mindfulness and wellbeing, and lower BIS scores compared to non-practitioners.

Sauer et al. (2011) concluded that practicing mindfulness can reduce sensitivity to punishment. However, it is debatable whether the practice of mindfulness would have changed the sensitivity of the BIS system at the neurological level or provided the practitioners of mindfulness strategies to mitigate the effects of high BIS sensitivity. Self-report measures of BIS measure the output of the system (avoidance motivation and the subjective experience of anxiety and fear) not the sensitivity of the system itself. Thus, if people learn strategies to manage negative affect they would very likely reported lower scores on measures of BIS even if the sensitivity of the neurological structures underlying BIS remained unchanged. Hamill, Pickett, Amsbaugh, and Aho (2015) argued that emotion regulation strategies can potentially mitigate the effects of BIS activity without changing the sensitivity of the BIS, implying that mindfulness maybe a moderator of the relationship between BIS sensitivity and psychological distress. Hamill et al. (2015) confirmed that facets of mindfulness moderated the relationship between BIS sensitivity and psychological distress.

Reese, Zielinski, and Veilleux (2015) predicted that facets of mindfulness would mediate, rather than moderate, the relationship between BIS sensitivity and emotion dysregulation as a result of individuals with high threat sensitivity underutilizing mindfulness skills. Their results supported this hypothesis but it was not made clear why high BIS activity should lead to underutilization of mindfulness skills. They did not test a moderation model and psychological distress was not assessed in this study.

The primary aim of the present study was to add to the literature by further investigating the relationships between mindfulness, dimensions of personality and psychological distress. The first specific aim was to establish whether trait mindfulness predicts psychological functioning over and above personality variables. The second aim was to test both the moderation and mediation models tested in previous studies as described above. The specific hypotheses tested were 1) that r-FFFS and r-BIS would mediate the relationship between mindfulness and psychological distress, and 2) that mindfulness would moderate the relationship between r-FFFS and r-BIS and psychological distress. We did not generate specific hypotheses relating to the r-BAS sub-system as our focus was on psychological distress rather than the positive

emotional states associated with reward sensitivity, although we did include r-BAS in mediation and moderation analyses for exploratory purposes. Unlike previous studies to date that have used measures of Gray's original Reinforcement Sensitivity Theory (o-RST) we used the Jackson 5 to measure the three sub-systems of r-RST (Jackson, 2009). The use of the Jackson 5 measure allows a more refined investigation of the relationship between r-RST, mindfulness and psychological functioning that is consistent with the revised theory.

## 2. Methods

### 2.1. Participants and procedure

A sample of 452 participants were recruited of which (72%) were female and the mean age was 21.4 years (ages ranged from 16 to 57 years). The majority (69%) of the participants were Caucasian, 20% were Asian (20%), and 11% ‘other’ ethnicity. Participants were either undergraduate students who received course credit for participating in the study (around 80% of the participants) or a community sample recruited through social media. For recruitment through social media, a link to an online survey was posted on relevant Facebook sites. All participants completed the battery of measures online using Qualtrics survey software. The study received ethical clearance from the school's ethical review process.

### 2.2. Measures

#### 2.2.1. r-RST

The Jackson 5 (Jackson, 2009) is a 30-item scale measuring r-BAS, r-BIS, r-Fight, r-Flight and r-Freezing, as described above. Higher scores reflect higher activity of the motivational systems. The internal consistency of the scales in this study were; r-BAS ( $\alpha = .80$ ), r-BIS ( $\alpha = .70$ ), r-Fight ( $\alpha = .80$ ), r-Flight ( $\alpha = .67$ ), r-Freezing ( $\alpha = .67$ ) and r-FFFS ( $\alpha = .71$ ). Other studies have reported higher levels of alpha on r-Flight and r-Freezing (e.g. Jackson, 2009). As the total r-FFFS score has greater reliability, and has been typically used in previous research, a total score was used in the current study.

#### 2.2.2. Mindfulness

The Five Facet Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006) is a 39-item self-report measure that examines five components of mindfulness: observation of one's internal experience and sensations (FFMQ-observe); non-judging of experience (FFMQ non-judging); the ability to describe one's emotional experience (FFMQ-describe); non-reactivity to inner experience (FFMQ-non-reactivity); and acting with awareness (FFMQ-act-with-awareness). The internal reliability of the scales in the present study were: FFMQ-observe ( $\alpha = .81$ ), FFMQ-describe ( $\alpha = .87$ ), FFMQ-act-with-awareness ( $\alpha = .89$ ), FFMQ-non-judging ( $\alpha = .87$ ), FFMQ-non-reactivity ( $\alpha = .72$ ) and FFMQ-total ( $\alpha = .82$ ).

#### 2.2.3. Psychological distress

The short form of the Depression, Anxiety and Stress Scale-short form (DASS; Lovibond & Lovibond, 1995) is a 21 item self-report measure that includes a depression scale measuring dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest/involvement, anhedonia and inertia; an anxiety scale measuring autonomic arousal, skeletal muscle effects, situational anxiety and subjective experience of anxious affect; and a stress scale measuring difficulty relaxing, nervous arousal, and agitation, irritability, and impatience. Higher scores reflect higher levels of psychological distress. The internal reliability of the scales in the present study were: Depression ( $\alpha = .88$ ), Anxiety ( $\alpha = .76$ ), and Stress ( $\alpha = .84$ ).

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