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# Examining posttraumatic growth and mindfulness in individuals with rheumatoid arthritis

Anna Hoffman  
*University of Iowa*

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Examining Posttraumatic Growth and Mindfulness  
in Individuals with Rheumatoid Arthritis

by

Anna Hoffman

A thesis submitted in partial fulfillment  
of the requirements for the Doctor of Philosophy  
degree in Psychological and Quantitative Foundations in the  
Graduate College of  
The University of Iowa

August 2017

Thesis Supervisor: Emeritus Professor Elizabeth M. Altmaier

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CERTIFICATE OF APPROVAL

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PH.D. THESIS

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This is to certify that the Ph.D. thesis of

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the thesis requirement for the Doctor of Philosophy degree  
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## ABSTRACT

The purpose of this study was to assess for posttraumatic growth (PTG) in individuals with rheumatoid arthritis (RA). This study also sought to determine the relationship between PTG and mindfulness for people with RA. RA is a degenerative disease characterized by chronic joint pain and is associated with various kinds of psychological distress, including depression, anxiety, and low self-esteem. More recently, researchers have looked to ways in which living with RA may also promote personal growth. One of the most commonly researched conceptualizations of growth following hardship is posttraumatic growth (PTG). Some studies suggest that PTG may be positively related to mindfulness, such that people who are more mindful also experience more growth following adversity. The present study examines the extent to which people report experiencing growth as a result of living with RA, as well as participants' levels of trait or dispositional mindfulness. Descriptive data are presented for all gathered data and the relationship between PTG and mindfulness was examined. Results of this study suggested that people with RA report moderate levels of PTG as a result of navigating this difficult disease. Findings also indicated no significant relationship between PTG and trait mindfulness for this sample of people with RA. Both PTG and trait mindfulness were significantly related to participants' pain severity, however. The results of this study add to a small body of literature suggesting that people with RA do experience PTG. Understanding the correlates of PTG following RA will help physicians and psychologists maximize opportunities for positive adjustment above and beyond premorbid levels of functioning for those living with RA. This study's findings also point to the importance of continuing to investigate the relationship between PTG and mindfulness.

## **PUBLIC ABSTRACT**

While the negative consequences of living rheumatoid arthritis (RA) are well-documented, it is less understood how people might experience personal growth as a result of adapting to this difficult disease. This study sought to understand the extent to which people experience growth as a result of living with RA. In addition, this study examined how a person's tendency to be mindful may be related to personal growth following RA.

Results of this study suggested people experience moderate levels of growth as a result of living with RA. The extent to which a person is mindful was not related to personal growth for this sample, but pain severity was related to both growth and mindfulness, such that people who reported more pain also reported experiencing more growth and were less mindful. The results of this study point to the importance of continuing to examine the correlates of growth in people with RA, as well as the relationship between growth and mindfulness.

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## **Chapter I**

### **Introduction**

Decades of research on the effects of traumatic events provide ample evidence that trauma typically results in adverse psychological and physical consequences (Tedeschi & Calhoun, 1996). The past three decades of research, however, have heralded a redirection of attention to positive adjustment after trauma. Positive adjustment after trauma has been conceptualized in many ways, including posttraumatic growth (Tedeschi & Calhoun, 1996), stress-related growth (Park, Cohen, & Murch, 1996), adversarial growth (Linley & Joseph, 2004), perceived benefits (Calhoun & Tedeschi, 1991), and thriving (O’Leary & Ickovics, 1995).

Posttraumatic growth, in particular, is one of the most widely studied conceptualizations of positive adaptation after trauma. Tedeschi and Calhoun (2004) defined posttraumatic growth as “positive psychological change experienced as a result of the struggle with highly challenging life circumstances” (p. 1). Posttraumatic growth is distinguishable from the related psychological constructs hardiness and resilience, because posttraumatic growth implies not just psychological resistance to trauma, but also a change in schemas that results in growth beyond premorbid functioning (Tedeschi & Calhoun, 2004).

Research demonstrates posttraumatic growth may occur in response to myriad types of trauma, including military combat (e.g., Morgan, Desmarais, Mitchell, & Simons-Rudolph, 2017), natural disasters (e.g., Nalipay, Bernardo, & Mordeno, 2017), motor vehicle accidents (e.g., Wu, Leung, Cho, & Law, 2016), and adulthood interpersonal violence (see Elderton, Berry, & Chan, 2017, for a review). Posttraumatic growth also occurs in the aftermath of health-related trauma, such as cancer (e.g., Liegey Dougall, Swanson, Kyutoku, Belani, & Baum, 2017) and HIV/AIDS (e.g., Zeligman, Barden, & Hagedorn, 2016). More recently, posttraumatic growth

has been studied in relation to chronic diseases not typically conceptualized as trauma. One such disease is rheumatoid arthritis.

Rheumatoid arthritis (RA) is a highly stressful, progressive disease characterized by chronic joint pain (Klareskog, Catrina, & Paget, 2009). For the millions of Americans who live with RA, chronic pain is often perceived as the largest impediment to health status (Minnock, FitzGerald, & Bresnihan, 2003). Living with rheumatoid arthritis affects not only physical well-being, but may also have consequences for psychological well-being. Literature reviews of the psychological effects of living with RA suggest depression, anxiety, and impaired self-esteem are common among RA patients (Gettings, 2010; Ryan, 2014).

The last three decades of psychological research suggest individuals with RA may also experience growth as a result of living with their disease, such as positive personality changes (Affleck, Pfeiffer, Tennen, & Fifield, 1988), new appreciation of support from loved ones (Danoff-Burg & Revenson, 2005), and enhanced meaning and appreciation of life (Abraído-Lanza, Guier, & Colón, 1998). Posttraumatic growth has also been associated with a multitude of positive psychological and physical outcomes for patients with RA, including reduced pain severity and level of disability, improved self-esteem and self-efficacy (Abraído-Lanza et al., 1998), and perceived social support (Dirik & Karanci, 2008). In short, RA patients appear to report growth as a result of living with RA, and growth seems to be related to a variety of positive psychological and physical variables. Research in this area, however, is still very limited.

Various psychological interventions have been studied in relation to enhancing RA patients' psychological well-being. Current models of chronic pain perception indicate pain is not just the result of physiological trauma, but also the result of a complex interaction between

cognitions, feelings, and the body (Melzack, 2001, 2005). As such, psychological interventions may positively impact RA patients' physical well-being in addition to enhancing psychological wellness. One psychological intervention that has received especial interest in relation to RA is mindfulness.

Mindfulness is an ancient Eastern tradition popularized in Western psychology by Jon Kabat-Zinn (McCown & Reibel, 2009). Mindfulness has been described as a flexible state of mind and sensitivity to context and perspective (Langer, 2009). Kabat-Zinn (1994) defined mindfulness as “paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally” (p. 4). Definitions of mindfulness abound, but authors generally agree mindfulness practice simultaneously engages three elements: attention, intention, and attitude (Shapiro, Carlson, Astin, & Freedman, 2006). Attention represents observing internal and external experiences, moment-by-moment. Intention refers to engaging in mindfulness for a particular purpose, which may vary from self-regulation, to self-exploration, to self-liberation. Finally, attitude represents the qualities of mindful attention, such as kindness, openness, and acceptance (Shapiro et al., 2006). Mindfulness practice can take on many forms, such as meditating on the breath, sounds, or an image, mind-body practices such as yoga and tai chi, or attending mindfully to everyday activities, such as walking and eating.

Mindfulness-based interventions have demonstrated positive effects on both psychological and physical functioning among RA patients, including reductions in anxiety, pain catastrophizing, fatigue, and disease activity (Davis et al., 2015; Fogarty, Booth, Gamble, Dalbeth, & Consedine, 2015). While both posttraumatic growth and mindfulness-based interventions appear to be associated with better psychological and physical functioning in RA patients, the relationship between posttraumatic growth and mindfulness is less understood.

Researchers have presented theoretical models of how mindfulness may facilitate meaning-making following hardship (Garland, Farb, Goldin, & Fredrickson, 2015), and research on the effects of mindfulness-based interventions on posttraumatic growth in cancer patients and survivors largely indicate mindfulness is positively associated with posttraumatic growth (e.g., Hawkes, Pakenham, Chambers, Patrao, & Courneya, 2014; Labelle, Lawlor-Savage, Campbell, Faris, & Carlson, 2015). Little is known, however, about the relationship between posttraumatic growth and mindfulness in individuals with RA.

A handful of studies have examined the relationship between posttraumatic growth and mindfulness as a psychological construct, hereafter referred to as trait or dispositional mindfulness, as opposed to an intervention. These studies suggest overall, trait mindfulness is positively related to posttraumatic growth, but some subdomains of mindfulness may be negatively related to posttraumatic growth. In particular, the nonjudgmental acceptance facet of mindfulness may be inversely associated with growth after trauma (Chopko & Schwartz, 2009; Hanley, Peterson, Canto, & Garland, 2014). In sum, although posttraumatic growth generally appears to be positively associated with mindfulness, this relationship needs further exploration among RA patients.

This study aims to contribute to the literature examining growth as a result of living with RA. Understanding growth in the context of RA may help psychologists and medical professionals tailor interventions to enhance RA patients' likelihood for positive adjustment. The purpose of this study, therefore, was to examine the extent to which RA patients report posttraumatic growth in response to living with RA. The relationship between posttraumatic growth and mindfulness was also explored. Finally, mindfulness was assessed for its

contribution to variance in posttraumatic growth above and beyond demographic and disease variables.

## **Chapter II**

### **Literature Review**

This literature review begins by discussing rheumatoid arthritis and current models of pain perception. Next, the psychological impact of rheumatoid arthritis is explored. Attention is then drawn to the experience of various kinds of positive adaptation in response to RA, with particular emphasis on posttraumatic growth (PTG). Mindfulness is introduced as a possible correlate or predictor of PTG, starting a review of the effects of mindfulness-based interventions on those with RA, and leading to a discussion of the limited research on the relationship between PTG and mindfulness. Finally, a summary of the reviewed literature is presented, as well as the purpose of the present study.

#### **Rheumatoid Arthritis**

Rheumatoid arthritis (RA) is a systemic, inflammatory, autoimmune disorder characterized by chronic joint pain (Klareskog et al., 2009). Signs and symptoms of RA include feelings of warmth, tenderness, and stiffness in the joints, particularly in the morning when the joints have not been used for hours; joint pain in the same joint on both sides of the body; and loss of range of motion and deformity in the joint (“Rheumatoid arthritis”, 2016). Other signs and symptoms of RA may include loss of energy and appetite, lumps beneath the skin (i.e. rheumatoid nodules), low fevers, and dry eyes and mouth that occur from a related health problem, Sjogren’s syndrome (Ruderman & Tambar, 2012). Sadly, RA is a progressive disease, meaning the signs and symptoms of RA may worsen over time (Gettings, 2010).

RA affects approximately .5-1% of adults in developed countries (Scott, Wolfe, & Huizinga, 2010), including over 1.3 million U.S. adults (Ruderman & Tambar, 2012). RA is three times more frequent in women than in men, and prevalence rises with age (Scott et al.,

2010). The cause of RA is unknown. Genetic factors attributed approximately 50% of the risk for developing RA (van der Woude et al., 2009), but other environmental factors (e.g., smoking, alcohol intake, low socioeconomic status) may also contribute to risk for developing RA (Carlens et al., 2010; Liao, Alfredsson, & Karlson, 2009). Current medical treatments may be effective in reducing symptoms of RA, but RA remains incurable (Gettings, 2010).

Research suggests individuals with RA perceive pain as the predominant impairment to their health status (Minnoc et al., 2003). Pain may be defined as “an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage” (Merskey & Bogduk, 1994). Individuals with RA experience chronic pain, defined as pain that persists over a period of six months (Hadjistavropoulos & Clark, 2001). Theories of how chronic pain is perceived have evolved greatly since early biomedical models asserted self-reported pain is directly proportional to physical pathology (Turk & Monarch, 2002). The perception of pain is now understood to be a complex interaction of body, mind, and environment. This new understanding of pain perception is referred to as the biopsychosocial model (Turk & Monarch, 2002) and includes theories of pain perception such as the gate control theory of pain (Melzack & Wall, 1965) and the neuromatrix theory of pain (Melzack, 1989). These theories are presented below to demonstrate how attention to psychological functioning may have a positive impact not only on an individual’s psychological well-being, but also their perception of pain.

### **Biopsychosocial Models of Pain**

Melzack and Wall’s (1965) gate control theory of pain marked a departure from biomedical explanations for pain to more complex biopsychosocial models. According to gate control theory, pain perception is not the result of a direct pathway from the site of physiological

damage to the brain, but the result of a “gate” mechanism in the dorsal horn of the spinal cord. This gate controls the passage of pain input to the T cells, or the dorsal horn’s transmission cells, which carry pain messages to the brain. The gate opens when excitatory fibers exceed the activity level of inhibitory fibers, which means the gate may open or close in response to a variety of factors, such as past experience with painful sensations, emotions, and thoughts (Melzack & Casey, 1968; Melzack & Wall, 1965). Gate control theory was the first model of pain perception to accurately account for the potential impact of psychological factors in the perception of pain.

Refinement of gate control theory led to the neuromatrix theory of pain (Melzack, 1989). While gate control theory emphasized the role of spinal and brain mechanisms in the perception of pain, neuromatrix theory went further to suggest the areas of the brain involved in pain perception are extensive and include somatosensory projections and the limbic system (Melzack, 2005). According to neuromatrix theory, the brain has a widely distributed neural network called the “body-self neuromatrix” (Turk & Monarch, 2002). The body-self neuromatrix receives inputs from cognitive-related areas of the brain (e.g., memories of the past, anxiety), sensory signaling systems (e.g., musculoskeletal inputs), and emotion-related brain areas (e.g., limbic system, homeostatic mechanisms) that influence the output of the neuromatrix. The outputs of the neuromatrix then travel to areas of the brain that produce pain perception, action patterns, and stress-regulation, which may result in the perception of chronic pain. In short, neuromatrix theory goes beyond gate control theory to suggest the areas of the brain involved in pain perception are vast, and that pain experiences may be modulated by the stress response and cognitive functions of the brain.

## **Biopsychospiritual Models of Pain**

Researchers have advocated for the incorporation of a spiritual component to models of pain, given the potential influence of spirituality and religiosity beliefs and experiences on pain perception, coping, and mental health in the presence of pain. Siddall and colleagues (2015) conducted a review of the literature on spirituality and pain and provided suggestions for how spirituality may be incorporated into current pain models. The authors' review indicated that spiritual practices are related to improved tolerance of acute (Wachholtz & Pargament, 2005) and chronic pain (Wachholtz & Pearce, 2009), including chronic pain as a result of RA (Keefe et al., 2001). People who identify as spiritual or religious and engage in religious activity have also been demonstrated to report better mood and less pain intensity compared to those with chronic pain who are not spiritual or religious (e.g., Lucchetti et al., 2011). Some research also indicates that using religious coping practices such as looking to God for strength is related to better mental health and adjustment to pain among those with chronic pain (Bush et al., 1999). On the contrary, some research suggests that certain forms of religious coping, such as feeling punished or abandoned by God, may be related to poorer mental health for chronic pain patients (Rippentrop, Altmaier, Chen, Found, & Keffala, 2005). In short, religious and spiritual practices may influence physical and psychological functioning in chronic pain patients and thus were assessed in the current study

To sum, contemporary models of pain suggest pain perception is more complex than a simple one-to-one relationship between pain and injury (Melzack, 2005). The models of pain perception presented above share recognition of how psychological variables such as cognitions and emotions and spiritual and religious variables may contribute to an individual's experience of pain. In addition, these models suggest that addressing psychological functioning can modify

the experience of pain. The next section explores the psychological sequelae associated with living with RA, as well as interventions developed to address these sequelae.

### **Psychological Impact of Rheumatoid Arthritis**

Rheumatoid arthritis is a highly distressing chronic disease that can have negative effects on psychological and social functioning. Bala and colleagues (2017) interviewed people with RA to better understand what it means to live with RA. The interviews revealed four themes. First, participants asserted that living with RA is “an existence dominated by painful symptoms and treatment” (p. 4). Second, participants reported drastic changes and new limitations in their lives as a result of RA. For some, the aggressive progression of their disease and sudden disability was experienced as traumatic. One participant noted, “The first five years were so difficult... I was almost completely disabled... suddenly I couldn’t do anything... I had pain, pain everywhere” (p. 5). Other themes included the continual struggle of learning to live with RA and becoming more dependent on those around you.

Poh and colleagues (2017) conducted a similar study of interviews with RA patients to understand their experiences. One of the themes that emerged from interviews was the psychological and emotional challenges that arise from living with RA. These challenges included anger, frustration, sadness, despair, helplessness, worry, fear, embarrassment, and low self-esteem. One participant noted, “Because of the pain, it is so painful that it frustrates you. You want to do something, but you can’t do it. You want to be like before, like a normal person” (p. 383).

Gettings (2010) and Ryan (2014) conducted reviews of the potential psychological consequences of RA, with attention to depression, anxiety, and low self-esteem. These psychological

consequences are explored in more depth below, with the addition of updated literature since the time of these reviews.

### **Depression and Anxiety.**

Individuals with RA may be at greater risk for developing a mental health condition than those without RA. A telephone survey conducted in Australia revealed individuals with RA were significantly more likely than adults without RA to report a mental health condition (14.9% versus 12.0%,  $p = .004$ ) and were at greater risk for anxiety or depression (39.0% versus 31.0%,  $p < .001$ ; Hill et al., 2007). Depression appears to be relatively common in individuals with RA. One study of 74 individuals with RA indicated 39% of patients had been diagnosed with clinical depression (Dickens, Jackson, Tomenson, Hay, & Creed, 2003). This study also suggested depressed RA patients were significantly more likely than non-depressed RA patients to experience social difficulties related to the disease ( $p = .004$ ; Dickens et al., 2003). Further, RA may be a risk factor for developing depression. Drosselmeyer and colleagues (2017) collected longitudinal data from 1072 general medical practices in Germany and found that patients with late-onset RA were significantly more likely to be diagnosed with depression compared to patients without RA within a five-year follow-up period. A review of correlates with depression in people with RA indicated that pain, functional status, disease duration, and RA treatment were all significantly related to depression (Jaquinta & McCrone, 2015). Finally, individuals with RA who are depressed are also more likely to report anxiety ( $p < .001$ ; Van Dyke et al., 2004). In short, depression affects many individuals with RA and may be associated with various other social and psychological difficulties, such as anxiety.

Depression may also be related to RA patients' physical functioning. A study of 22,131 RA patients revealed self-reported pain and fatigue were the best predictors of self-reported

depression (Wolfe & Michaud, 2009). RA patients who are depressed are also at greater risk for myocardial infarction (Scherrer et al., 2009), are more likely to use healthcare services (Joyce, Smith, Khandker, Melin, & Singh, 2009), and may have increased mortality (Ang, Choi, Kroenke, & Wolfe, 2005). In addition, Hider and colleagues' (2009) study of depressed RA patients indicated depression may interfere with physical treatment outcomes. Depressed RA patients treated with anti-tumor necrosis factor (TNF) medication had significantly higher disease activity scores (DAS28) at pretreatment than RA patients who were not depressed ( $p = .005$ ). At the end of 12 months of anti-TNF therapy, depressed patients had significantly smaller reductions in DAS28 than patients who were not depressed ( $p = .005$ ; Hider et al., 2009). As such, as Gettings (2010) noted, addressing depression in individuals with RA may improve not only psychological functioning, but physical treatment outcomes, as well.

### **Self-Esteem.**

Individuals with RA may also experience issues related to self-esteem. In one study, approximately 30% of RA patients reported feeling less attractive as a result of their disease, and these feelings were associated with higher levels of depression and using concealing behaviors to reduce the noticeability of their RA (Monaghan et al., 2007). Patients with RA who are concerned about body image (e.g., swelling and deformity of the joints) are also more likely to report poorer quality of life (Jorge, Brumini, Jones, & Natour, 2010). One study found that lower self-esteem in people with RA was related to higher self-stigma, or the extent to which a person held negative attitudes about people with RA (Corker, Brown, & Henderson, 2016). Like depression, self-esteem may also be related to physical functioning among people with RA. For example, one study found self-esteem and psychological well-being were negatively associated

with joint tenderness (Krol et al., 1994). Changes in self-esteem, then, are another important factor in considering the psychological impact of RA.

In short, the negative impact of RA on psychological functioning is well-documented. The psychological effects of living with RA are not necessarily always negative, however. The past few decades of research on the psychological effects of living with chronic illness have revealed many individuals also experience personal growth as a result of living with their disease. For example, posttraumatic growth has been reported among individuals with a variety of health-related issues, including cancer, HIV/AIDS, multiple sclerosis, and brain and spinal cord injuries, among others (see Barskova & Oesterreich, 2009, for a review). Studies of positive personal growth in light of living with RA are summarized in the following section.

### **Positive Adaptation after Rheumatoid Arthritis**

Several constructs related to positive adaptation have been studied among individuals with RA, including benefit finding (Danoff-Burg, Agee, Romanoff, Kremer, Strosberg, 2006; Danoff-Burg & Revenson, 2005; Sato, Yamazaki, Sakita, & Bryce, 2008) or perceived benefits (Affleck et al., 1988; Evers et al., 2001; Tennen, Affleck, Urrows, Higgins, & Mendola, 1992), thriving (Abraído-Lanza et al., 1998), and posttraumatic growth (Dirik & Karanci, 2008; Purc-Stephenson, 2014). Although the literature on positive adaptation after RA is nascent, preliminary findings suggest individuals with RA report a variety of positive byproducts of living with RA. The following section explores these positive byproducts.

#### **Benefit Finding.**

Benefit finding may be defined as identifying benefits as a result of experiencing adversity (Tennen & Affleck, 2002), although the way benefit finding is defined and assessed varies greatly across studies. Benefit finding may manifest in a number of ways, including

increased appreciation of life, enrichment of interpersonal relationship, and a deepened sense of spirituality or life purpose (Danoff-Burg & Revenson, 2005). Several studies have explored benefit finding among individuals with RA and have demonstrated most individuals with RA report benefit finding in several domains.

Danoff-Burg and Revenson (2005) conducted a longitudinal, mixed methods study of individuals with RA to explore the positive effects of RA on interpersonal relationships, identify constructs related to interpersonal benefit finding among patients with RA, and examine the relationship between interpersonal benefit finding and adjustment. A total of 124 patients with RA responded to questions about benefit-finding, social constraints, demographic information (e.g., age, gender), and disease-related information (e.g., years since diagnosis) at Time 1. Functional disability, psychological distress, and perceived pain severity were also assessed at Time 1 and one year later at Time 2. Interpersonal benefit finding was assessed using an open-ended question regarding “positive effects that having RA has had on your relationships with others” (p. 94).

The authors found 71.3% of the sample described interpersonal benefits as a result of RA, including themes such as appreciation of support from loved ones (35.3%), increased compassion/empathy (19.9%), educating others (7.4%), and discovering the kindness of strangers (4.4%), among others. Several participants (16.2%) also identified benefits not related to interpersonal relationships, including having a new outlook on life or the self (16.2%). A minority of the sample (12.5%) indicated they experienced no benefits as a result of living with RA. Interpersonal benefit finding was shown to be associated with less pain, lower psychological distress, and fewer social constraints at Time 1, as well as lower levels of disability at Time 2.

Benefit finding has also been examined among people living with RA in Japan (Sato et al., 2008). The purpose of this study was to describe the nature of benefit finding, explore benefit finding's impact on mental health, and identify social factors predictive of benefit finding. Patients with RA (n=364) were administered questionnaires assessing RA-related variables (e.g., years since diagnosis, pain severity), general mental health, benefit finding, social difficulties resulting from RA, emotional support networks, and self-care activities. Benefit finding was assessed with the extent to which participants engaged in a variety of forms of benefit finding using a five-point Likert scale. The vast majority of participants reported at least one type of benefit finding (n=355), with "appreciating things that were not previously important" (n=306) and "becoming compassionate toward others" (n=298) as the most common responses. Individuals who reported larger emotional support networks and engaging in more self-care activities had higher levels of benefit-finding. Moreover, benefit finding was found to be the strongest predictor of general mental health among the factors examined. In sum, the majority of individuals with RA found at least one benefit from their RA experience, and those with higher benefit finding scores reported better mental health, larger emotional support networks, and greater engagement in self-care.

In addition to exploring the presence and effects of benefit finding, authors have also begun to explore the effects of benefit finding interventions among people with RA. Danoff-Burg and colleagues (2006) recruited 75 adults with lupus or rheumatoid arthritis to participate in one of three four-session writing interventions: benefit finding (BF), expressive writing (EW), or a control group. In the BF condition, participants were instructed to write about positive and thoughts and feelings regarding their rheumatic disease experience. In the EW condition, participants were instructed to write about their "deepest thoughts and feelings" regarding

rheumatic disease. Finally, control group participants were asked to provide a detailed account of facts about their disease and its treatment. Trait anxiety was assessed at baseline, and measures of functional disability, depressive symptoms, positive mood, pain, and fatigue were administered at baseline and at one- and three-month follow-ups. The authors found fatigue was lower for participants in the BF and EW conditions at three-month follow-up. Individuals with high trait anxiety reported more pain reduction in the BF group, whereas individuals with low trait anxiety reported more pain reduction in the EW group. As such, interventions aimed at enhancing benefit finding may improve fatigue for individuals with RA, as well as pain for individuals who also endorse high trait anxiety.

The results of these studies suggest many individuals with RA find benefits in their disease experience, including interpersonal benefits and new outlooks on life and the self. Moreover, benefit finding may be associated with several positive physical and psychological outcomes, including less pain, fatigue, psychological distress, and lower levels of disability. Some studies have also explored positive adaptation to RA as “perceived benefits” from living with RA. The results of these studies are presented below.

### **Perceived Benefits.**

Like the benefit finding literature, definitions and measures of perceived benefits vary across studies. Generally, perceived benefits studies broadly assess for the presence of growth from RA beyond premorbid functioning. Studies exploring the presence of perceived benefits after living with RA suggest many individuals with RA report a number of perceived benefits from navigating their disease.

The first study of perceived benefits from living with RA asked 129 participants to describe what, if any, “gains, benefits, or advantages have come from living with this illness”

(Affleck et al., 1988, p. 73). The vast majority of participants reported one or more benefits from living with RA. These benefits were coded into the categories of positive personality change (57.4%), increased empathy (31%), improved relationships (12.4%), new opportunities (5.4%), benefits for family members (4.7%), change in priorities (3.9%), and spiritual development (2.3%). These results mirror findings from benefit finding literature that suggest individuals with RA may perceive benefits across diverse life domains.

In another study, a group of 54 RA patients were asked to track their daily pain intensity, mood, and activity limitations due to pain over the course of 75 days (Tennen et al., 1992). The authors examined how participants' dispositional optimism and perceptions of control over and benefits from pain affected their pain experiences and mood. Perceived benefits of chronic pain were assessed using a five-item, six-point Likert scale measure. The items included, "My pain has helped me find new faith," "I have learned a great deal from my pain," "Dealing with my pain has made me a stronger person," "My pain has made life more precious to me," and "My pain has helped me realize what's important in life." Pertinent to the current study, perceived benefits of RA predicted the number of days during which pain interfered with daily activities. Specifically, those who were able to perceive more benefits from living with RA reported fewer days when pain interfered with their daily activities, especially among participants with more severe pain.

Evers and colleagues (2001) also assessed perceived benefits of RA in the development of the Illness Cognition Questionnaire (ICQ). The ICQ assesses three categories of illness cognitions: helplessness, acceptance, and perceived benefits. The authors identified three major perceived benefits as a result of chronic illness: changes in life priorities and goals, positive personality changes, and improved personal relationships. Patients with RA (n=263) and

multiple sclerosis (n=167) were included in a sample to test the reliability and validity of the instrument. Participants were also assessed for disease activity (i.e. number of swollen and painful joints), functional disability, physical complaints, negative and positive mood, disease impact on daily life, personality dimensions, coping strategies, and social support. The authors found, for both patients with RA and multiple sclerosis, acceptance and perceived benefits cognitions were related to positive psychological and physical health, independent of the influence of neuroticism. These results mirror Tennen et al.'s (1992) findings that perceived benefits of living with RA are associated with better physical functioning and go further to suggest perceived benefits are also associated with better psychological functioning. In short, living with RA may lead to a variety of perceived benefits, many of which are also supported by the benefit finding literature.

### **Thriving.**

In addition to the study of benefits following RA, one study investigated the presence of psychological thriving among Latinas with chronic illness over a three-year period (Abraído-Lanza et al., 1998). The authors operationalized thriving as growth beyond premorbid functioning in terms of finding new strength, insights, and meaning in life as a result of illness. A sample of 109 Latina women with primarily rheumatoid arthritis (54.1%), lupus (15.6%), or osteoarthritis (15.6%) were interviewed to understand their experiences of thriving. Based on the women's responses, a thriving scale was created to assess the predictive value of various social and personal factors related to thriving at a three-year follow-up. The majority of respondents (83%) described a variety of thriving experiences, the most common of which was enhanced appreciation and meaning (30.2%). At follow-up, thriving was related to the personal resources self-esteem, self-efficacy, and psychological well-being. Illness characteristics such as pain

severity, level of disability, and time since diagnosis and social factors such as social support, acceptance of disability, and acculturation were not related to experiences of thriving.

Caution should be exercised comparing the results of this study on thriving to the results of the benefit finding and perceived benefits literature. This study examined thriving in a sample of Latina women, specifically, with chronic illnesses not limited to RA. Moreover, thriving was operationalized differently from benefit finding and perceived benefits. It is notable, however, that thriving was not associated with better physical functioning, which is incongruent with findings suggesting a negative relationship between benefit finding or perceived benefits and pain, fatigue, and disability. Consistent with the benefits literature, the majority of participants identified a variety of thriving experiences, including having new appreciation, and thriving was associated with better psychological functioning.

### **Posttraumatic Growth.**

Given that posttraumatic growth (PTG) is the focus of this study, this review of PTG in people with RA begins with a broader definition of PTG. Posttraumatic growth is conceptualized as both a process and multidimensional outcome in response to a traumatic event. Tedeschi and Calhoun (2004) proposed a model of posttraumatic growth as a process. They argued the posttraumatic growth process begins when a highly challenging life circumstance disrupts the way an individual thinks about the world, or the individual's schemas about the world (e.g., "Bad things don't happen to good people.") This disruption of schemas is often highly distressing, so the individual engages in coping processes, such as cognitive processing of the event. The authors asserted posttraumatic growth outcomes are partly contingent on the extent to which an individual cognitively processes the traumatic event. Finally, Tedeschi and Calhoun (2004) argued that the positive changes in schemas that result from the posttraumatic growth process

appear to be related to increased wisdom and development of one's life narrative. As an outcome, posttraumatic growth is most often measured using the Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996).

Posttraumatic growth has been examined extensively in the context of life-threatening illness, such as cancer, but the extent to which PTG also occurs for those with nonlife-threatening chronic disease is mostly unknown. Although rheumatoid arthritis is not typically conceptualized as a trauma, research indicates that the life changes resultant from RA can be perceived as traumatic (Bala et al., 2017). Under Tedeschi and Calhoun's (2004) model, PTG occurs when an event is distressing enough to disrupt an individual's schemas about the world or self. Previous research of the effects of RA certainly indicates that RA is a very challenging, disrupting life event, which may prompt people to engage in the necessary appraisals to engender growth of how their lives have changed as a result of living with RA. The following studies started the work of examining PTG in individuals with RA.

Dirik and Karanci (2008) examined posttraumatic growth among 117 Turkish RA patients. The authors' objectives included identifying domains of posttraumatic growth in a Turkish sample, comparing domains to those identified in Western samples, and examining the predictive roles of demographic, illness-related coping, and self-efficacy variables in regard to posttraumatic growth. Results indicated the RA patients sampled experienced moderate levels of overall posttraumatic growth ( $M = 51.86$ ,  $SD = 25.91$ ). Factor analyses revealed three significant factors of posttraumatic growth for this sample, including relationship with others (e.g., "Having compassion for others"), philosophy of life (e.g., "I established a new path for my life"), and self-perception (e.g., "Knowing I can handle difficulties"), as opposed to the five-factor structure proposed by Tedeschi and Calhoun (1996). Finally, perceived social support was predictive of

total posttraumatic growth and all three subdomains of posttraumatic growth, while problem-focused coping was predictive of total posttraumatic growth, relationship with others, and self-perception. Perceived disease severity, measured by the pain subscale of the Arthritis Impact Measurement Scale 2 (AIMS2; Meenan, Mason, Anderson, Guccione, & Kazis, 1992), predicted scores in the self-perception domain of posttraumatic growth. Age was also found to be predictive of scores in the philosophy of life domain.

Purc-Stephenson (2014) also assessed PTG in individuals with chronic, nonlife-threatening disease. The sample included participants diagnosed with arthritis ( $n = 301$ ) or irritable bowel disease ( $n = 544$ ). Most participants in the arthritis group reported having rheumatoid arthritis ( $n = 120$ ). Other participants were diagnosed with osteoarthritis ( $n = 83$ ), psoriatic arthritis ( $n = 37$ ), fibromyalgia ( $n = 29$ ), ankylosing spondylitis ( $n = 17$ ), lupus ( $n = 6$ ), Reiter's syndrome ( $n = 8$ ), or gout ( $n = 1$ ). Analyses revealed participants in the arthritis group reported moderate levels of posttraumatic growth ( $M = 50.20$ ,  $SD = 25.92$ ). Thus, mean total PTGI scores were quite similar to those reported by Dirik and Karanci ( $M = 51.86$ ; 2008).

In sum, people report experiencing growth as a result of living with RA. This growth is manifested in many ways, including interpersonal benefits, new appreciation of social support and life, increased compassion and empathy, positive personality changes, spiritual growth, and more. Moreover, these positive adaptations to living with RA are associated with lower levels of psychological and physical distress. Although the examination of PTG, specifically, in people with RA is nascent, two studies suggest people do experience posttraumatic growth as a result of living with RA. As a result, people with RA may benefit from research that adds to the base of evidence that PTG does occur as a result of living with RA, as well as investigations of the correlates and predictors of PTG in people with RA. One construct that has received especial

attention in recent RA literature is mindfulness. A summary of the effects of mindfulness-based interventions on RA is provided below, followed by a review of the relationship between PTG and mindfulness.

### **Mindfulness-Based Interventions for Rheumatoid Arthritis**

Several recent clinical trials have suggested mindfulness training affects multiple areas of psychological well-being in patients with RA (e.g., Pradhan et al., 2007; Nyklíček, Hoogwegt, & Westgeest, 2015; Zautra et al., 2008). Some research goes further to suggest mindfulness-based interventions may be more effective at treating distress related to RA than cognitive-behavioral interventions. For example, Davis and colleagues (2015) conducted a study of 143 patients with RA who were randomized to one of three eight-week treatment conditions: a cognitive-behavior intervention for pain (CBT-P), a mindfulness-based intervention for awareness and acceptance (M), and an arthritis education condition (E). Participants were instructed to complete 30 consecutive evening diaries that assessed for pain, fatigue, morning disability, interpersonal stress, pain catastrophizing, and serene and anxious affects. Compared to the CBT-P and E conditions, participants in the M condition reported greater reductions in pain catastrophizing, morning disability, fatigue, and daily anxious affect. These results suggest mindfulness-based interventions may be more effective than traditional cognitive-behavioral interventions for managing the physical and psychological symptoms of RA.

Mindfulness may also have positive effects on disease activity for individuals with RA. One study of the effect of mindfulness-based stress reduction (MBSR) on disease activity in individuals with RA randomly assigned 51 patients with RA to an eight-week MBSR condition or a wait-list control group (Fogarty et al., 2015). Early morning stiffness, pain severity, and disease activity, assessed with the Disease Activity Score in 28 joints – C-reactive protein

(DAS28-CRP), was measured at pretreatment, post treatment, and at two-, four-, and six-month follow-ups. Participants in the MBSR group showed greater improvements in DAS28-CRP scores from pretreatment to post treatment and at all follow-up points compared to participants in the control group. The MBSR participants also showed significantly greater reductions in morning stiffness and pain scores at post treatment and follow-ups. In short, mindfulness-based interventions may positively impact not just psychological and physical symptoms of RA, but also physiological disease activity.

### **Mindfulness and Posttraumatic Growth**

Although both PTG and mindfulness appear to be related to positive psychological and physical functioning in people with RA, the relationship between PTG and mindfulness for this population has not yet been examined. The relationship between PTG and mindfulness has been reviewed in other contexts, however, although the body of literature is still quite small. Garland and colleagues (2015) proposed a theory of how mindfulness may lead to meaning-making following adversity, titled the *mindfulness-to-meaning theory*, which is presented below. This section also reviews research that examined the effect of mindfulness-based interventions on PTG for people with cancer. The section concludes with a review of studies examining the relationship with PTG and trait mindfulness.

#### **Mindfulness-to-Meaning Theory.**

Since the popularity of mindfulness in the West, research attention has focused mainly on the way in which mindfulness aids in nonevaluative engagement with experience, but less attention has been paid to the role of mindfulness in facilitating eudaimonic states (Garland et al., 2015). Garland and colleagues (2015) proposed the *mindfulness-to-meaning theory* as a way of understanding how mindfulness practice may engender positive reappraisals of stressful life

events. The authors argue that mindfulness allows a process of decentering, or shifting from a focus on the contents of thoughts, emotions, and sensations related to a distressing experience, to a metacognitive awareness that acknowledges thoughts and feelings for what they are, as opposed to facts about the self or world. This metacognitive awareness allows survivors of distressing events to let go of initial, negative appraisals of the experience and makes room for more positive, adaptive reappraisals of the impact of the event.

In addition to decentering, mindfulness practice promotes acceptance of the experience. Acceptance of highly distressing life events may promote meaning-making by freeing up cognitive resources otherwise spent perseverating on the event, which may broaden attentional awareness to include meaningful changes as a result of contending with the stressor. The authors propose that this process of mindfulness facilitating meaning spirals upward: mindfulness facilitates positive reappraisals, leading to more positive emotions, which may lead to more prosocial behaviors, and ultimately to a greater sense of purpose or meaning in life (Garland et al., 2015).

Garland and colleagues (2017) tested the *mindfulness-to-meaning* theory by examining the relationship between state mindfulness and positive reappraisal in a community sample participating in an eight-week mindfulness-based intervention. The authors found that increases in state mindfulness experienced during meditation were associated with more frequent positive reappraisals. Further, mindfulness states facilitated by meditation and positive reappraisal coping mutually strengthened and reinforced each other over time (Garland, Kiken, Faurot, Palsson, & Gaylord, 2017), supporting the hypothesis that this relationship may be conceptualized as an upward spiral.

Tedeschi and Blevins (2015) speculated about how the *mindfulness-to-meaning theory* may apply to posttraumatic growth, asserting that the processes of mindfulness, decentering, and positive reappraisals likely play a role in facilitating growth among the five factors of PTG. The authors also caution that more research is needed to generalize the mechanisms of the *mindfulness-to-meaning theory* to the relationship between mindfulness and PTG. The following section continues to explore the relationship between mindfulness and PTG by reviewing the impact of mindfulness-based interventions on PTG.

### **Mindfulness-Based Interventions and Posttraumatic Growth.**

Shiyko, Hallinan, and Naito (2017) conducted a meta-analysis to determine the short-term effects of mindfulness training on PTG. The analyses included 11 studies of patients with physical health diagnoses: 10 studies were comprised of cancer patients, and one study was comprised on neuromyalgia patients. The total sample size was 1195 participants. The majority of studies employed mindfulness-based stress reduction or mindfulness-based cancer recovery as the mindfulness-based intervention. The meta-analysis revealed an estimated cumulative effect size of .34 (95% CI: .22-.44), indicating a small effect size in PTGI scores immediately following a mindfulness-based intervention. Results revealed the largest effect sizes occurred within the domains Relating to Others ( $\mu = 0.45, p < 0.1$ ) and Appreciation of Life ( $\mu = 0.41, p < 0.1$ ); these results were based on the analysis of four of the 11 studies included, however, and should be interpreted with caution. In sum, the findings of this meta-analysis suggest mindfulness-based interventions may facilitate PTG shortly after the intervention, particularly for people with cancer.

Important to note, one study found no significant relationship between mindfulness-based interventions and PTG. A sample of 62 men and women reporting psychological distress less

than three years post treatment for cancer were randomly assigned to online Mindfulness-Based Cancer Recovery (MBCR) program or a wait-list control (Zernicke et al., 2014). The MBCR program was designed to help cancer survivors cultivate nonjudgmental, present-moment awareness through training in mindfulness meditation and Hatha yoga. Participants' mood, stress, posttraumatic growth, spiritual well-being, and mindfulness were assessed pre- and post-intervention. Participants in the MBCR condition reported significant improvements relative to participants in the wait list condition across measures of mood ( $d = .44$ ), stress ( $d = .49$ ), spiritual well-being ( $d = .37$ ), and mindfully acting with awareness ( $d = .50$ ). Notably, analyses also revealed posttraumatic growth increased at post treatment compared to pretreatment scores regardless of group assignment, suggesting time had a greater effect on posttraumatic growth than the mindfulness intervention.

These findings represent a departure from other mindfulness-based intervention studies that suggest mindfulness interventions may have a positive impact on PTG, which points to the importance of continuing to examine the relationship between PTG and mindfulness. Further, the vast majority of studies examined the relationship between mindfulness-based interventions and PTG in people with cancer, and thus the results may or may not be generalizable to those with RA. The following section reviews studies exploring the relationship between PTG and trait mindfulness.

### **Relationship between Trait Mindfulness and Posttraumatic Growth.**

A few studies examined the relationship between posttraumatic growth and trait or dispositional mindfulness. Chopko and Schwartz (2009) examined the relationship between mindfulness and posttraumatic growth among first responders to traumatic incidents. A sample of 183 police officers completed the PTGI and the Kentucky Inventory of Mindfulness Skills

(KIMS; Baer, Smith, & Allen, 2004), which measures the tendency to be mindful on a daily basis. The KIMS, similar to the Five-Facet Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006) used in this study, measures mindfulness tendencies of observing, describing, acting with awareness, and accepting without judgment. A Pearson correlation matrix revealed PTGI scores were significantly positively related to mindfulness tendencies Observing ( $r = .27, p < .001$ ) and Describing ( $r = .16, p = .04$ ), and PTGI scores were significantly negatively related to Accepting without Judgment ( $r = -.30, p < .001$ ). Of the KIMS tendencies, a multiple regression analysis revealed only Accepting without Judgment ( $\beta = -.27$ ) significantly contributed to the prediction model for PTGI. This is the first published study to suggest some domains of mindfulness, particularly accepting experiences without judgment, may be negatively associated with posttraumatic growth.

Hanley and colleagues' (2014) investigation of the relationship between mindfulness and posttraumatic growth yielded similar results. The authors examined differences in the relationship between mindfulness and posttraumatic growth among contemplative mindfulness practitioners ( $n = 65$ ) and nonpractitioners ( $n = 248$ ). Contemplative mindfulness practice was defined as regular participation in activities such as mindfulness meditation, yoga, or tai chi. Posttraumatic growth was assessed using the PTGI, while mindfulness was assessed with the FFMQ. First, the relationship between mindfulness and posttraumatic growth was significantly stronger for contemplative practitioners ( $d = .62$ ) than nonpractitioners ( $d = .36$ ). In addition, the authors found significant differences in the relationship between mindfulness and posttraumatic growth for practitioners versus nonpractitioners. For nonpractitioners, the mindfulness facets Describing ( $d = .57$ ) Observing ( $d = .37$ ), and Nonreacting ( $d = .34$ ) had the strongest relationships with posttraumatic growth. For contemplative practitioners, however, Nonjudging

( $d = -.46$ ) was negatively correlated with posttraumatic growth, while Nonreacting ( $d = .83$ ) and Acting with Awareness ( $d = .40$ ) were both positively correlated with posttraumatic growth. Like Chopko and Schwartz's (2009) findings, it appears accepting experiences without judgment may be negatively associated with posttraumatic growth, particularly among mindfulness practitioners.

One dissertation also examined the relationship between mindfulness and posttraumatic growth among bereaved college students ( $n = 168$ ) (Donah Burke, 2009). Posttraumatic growth was measured using the PTGI, while mindfulness was measured with the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003). The author also assessed for information related to the students' bereavement, including perceived closeness to the deceased person, time since death of the deceased person, type of relationship, grief-related distress, and impact of the event, as well as several demographic variables. Notably, the author found mindfulness was negatively associated with the PTGI Personal Strength ( $r = -.15, p < .05$ ) and New Possibilities ( $r = -.17, p < .05$ ) subscales. When perceived closeness to the deceased individual, grief-related distress, and impact of the event were taken into account, however, the relationship between mindfulness and Personal Strength was no longer significant. Similarly, when ethnicity, grief-related distress, and impact of the event were taken into account, the relationship between mindfulness and New Possibilities was also found nonsignificant.

Finally, Hanley, Garland, and Tedeschi (2016) assessed for the relationship between core belief disruption, intrusive rumination, deliberate rumination, dispositional mindfulness, positive reappraisal, posttraumatic stress, and posttraumatic growth in a sample of college students who had experienced at least one traumatic event. Relevant to this study, the authors found a modest, positive relationship between dispositional mindfulness and PTG. The mindfulness subdomains

of nonreacting and describing were indirectly, positively related to PTG through positive reappraisal. The other mindfulness domains – observing, acting with awareness, and nonjudgment – were found to have negative, indirect relationships with PTG, primary through deliberate and intrusive ruminations. Based on these results, the authors concluded that mindful individuals are more likely to experience PTG, but the extent to which an individual experiences PTG is relative to the intensity of the disruption of the individual’s schemas as a result of the trauma.

These studies of PTG and trait mindfulness have several implications. First, there appears to be an overall positive association between PTG and trait mindfulness. Moreover, this association may be stronger for individuals engaged in contemplative mindfulness practices compared to nonpractitioners. Two studies also suggested that measures of the mindfulness subdomain “nonjudgment” may be negatively associated with overall posttraumatic growth. It is possible that the tendency to accept experiences without judgment may impede cognitive processing of the traumatic event, thereby inhibiting growth. Donah Burke’s (2009) findings also suggest certain variables related to the traumatic event may affect the relationship between posttraumatic growth and mindfulness, particularly those related to the impact of the event. Overall, more research on the relationship between posttraumatic growth and mindfulness as a psychological construct is necessary before firmer conclusions about the relationship may be drawn.

### **Summary and Conclusions**

Rheumatoid arthritis is a highly distressing chronic disease that affects millions of Americans. Our current understanding of chronic pain models suggests psychological variables may impact perception of pain among individuals with RA. Unfortunately, RA is often

associated with decreased psychological well-being, such as depression, anxiety, and low self-esteem. Therefore, it is imperative to continue examining the processes that engender psychological well-being for those with RA, since attending to psychological well-being impacts not only emotional wellness, but also pain perception.

One process and outcome associated with psychological well-being in those with RA is positive adaptation to RA. Individuals with RA appear to report experiencing intrapersonal and interpersonal growth as a result of contending with the distress of living with RA. Prior to this study, however, one of the most commonly studied conceptualizations of growth, posttraumatic growth, was seldom examined in people with RA, presumably because RA is not typically conceptualized as trauma. Two pioneering studies of PTG in people with RA suggest that people do experience PTG as a result of living with RA. This study aimed to contribute to that base of evidence and expand the examination of correlates with PTG in response to RA.

One construct that may be examined in relation to PTG is mindfulness. Similar to PTG, research suggests mindfulness is positively related to psychological and physical functioning in people with RA. The relationship between PTG and mindfulness is less understood. Some preliminary research has indicated that although PTG and mindfulness appear to be positively related, some aspects of mindfulness, such as accepting experiences without judgment, may be negatively related to posttraumatic growth. A model has also been proposed for how mindfulness may lead to meaning-making following adversity. However, the relationship between PTG and mindfulness has never been assessed in people with RA. Understanding the relationship between PTG and mindfulness among patients with RA may help optimize mindfulness-based interventions for RA, which may positively impact pain perception and psychological and physical well-being.

## **Purpose of Study**

The first purpose of this study was to determine the extent to which individuals with RA report PTG as a result of experiencing the distress of living with RA. The second purpose of this study was to examine the correlation between PTG and trait mindfulness among individuals with RA. The third purpose of this study was to understand the extent to which mindfulness explains variance in PTG above and beyond age, gender, time since diagnosis, and pain severity. The next chapter describes the methods and procedures of the study.

## **Chapter III**

### **Method**

This chapter describes the method for this study, including participation selection criteria, procedures, and measures. All research procedures were approved by the University of Iowa Institutional Review Board.

#### **Participants**

Participants had to be over 18 years of age and have a self-reported diagnosis of RA to be eligible for this study. In order to increase the validity of self-reported RA diagnoses, a third inclusionary criterion was that participants had to be taking one or more of the following disease-modifying anti-rheumatic drugs (DMARDs) from a checklist: methotrexate, azathioprine, D-penicillamine, sulfasalazine, etanercept, gold sodium thiomalate, cyclophosphamide, infliximab, hydroxychloroquine, leflunomide, glucocorticoid steroids (prednisone), and gold. Individuals were excluded from participation if they checked “none of the above.” This inclusionary criterion was based on Formica et al.’s (2010) finding that the positive predictive value of confirmed RA was 76% among women who self-reported both RA and DMARDs, compared to 29% among women who reported RA and no medication. The DMARD checklist used in this study was the same used in the Formica et al. (2010) study. Participants under the age of 18, those without a self-reported RA diagnosis, and those who did not report taking a DMARD were excluded from the study.

#### **Procedure**

Participants were recruited through posts in rheumatoid arthritis support groups hosted through message boards and Facebook (e.g., “Rheumatoid Arthritis (RA) Squeaky Joints,” “HealingWell.com Rheumatoid Arthritis Forum”). The post included a link to an online survey.

Participants first read information regarding informed consent and navigated to the next page of the survey if they consented to participation. Participants were then asked questions regarding the inclusion criteria. Participants who did not meet eligibility requirements were told they did not meet criteria for inclusion in the study and were thanked for their interest and time.

Participants who met eligibility requirements were directed to the online survey, which included measures of demographic information, pain severity, posttraumatic growth, mindfulness, and engagement in meditation. At the conclusion of the survey, participants were thanked for their participation and provided with a resource sheet on mindfulness.

## **Measures**

### **Demographic Questionnaire.**

Demographic information was collected from each participant. Participants reported age, gender, race, highest level of education, employment status, date of RA diagnosis (expressed in month and year), and marital status. Participants' religiosity and spirituality were also assessed using three items from the Fetzer Institute Brief Multidimensional Measure of Religiousness/Spirituality (Fetzer Institute & National Institute on Aging Working Group, 1999). Other studies have similarly selected one or a few items from this measure to assess for religiosity and spirituality (e.g., Watt et al., 2014). See Appendix A for the complete demographic questionnaire.

### **Pain.**

Pain was measured using the short-form McGill Pain Questionnaire-2 (SF-MPQ-2; Dworkin et al., 2009). The SF-MPQ-2 is an expanded and revised version of the original short-form McGill Pain Questionnaire (SF-MPQ; Melzack, 1987). The SF-MPQ-2 is comprised of 22 descriptive words (18 sensory, four affective) that assess for neuropathic and non-neuropathic

pain experienced during the previous week, rated on an intensity scale from 0 (none) to 10 (worst possible). Examples of descriptors include “throbbing pain,” “tender,” and “tiring-exhausting.” A total score for these 22 items constituted participants’ overall pain severity.

The SF-MPQ-2 demonstrated good psychometric properties with a diverse chronic pain sample that included participants with rheumatoid arthritis (Dworkin et al., 2009). Internal consistency ranged from .91-.95 across two administrations of the SF-MPQ-2. Total pain scores also correlated significantly with the Brief Pain Inventory (Cleeland & Ryan, 1994), another well-validated measure for pain, indicating construct validity

### **Posttraumatic Growth.**

Posttraumatic growth was assessed using the Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996). The PTGI was designed to measure positive adaptation after experiencing a highly distressing or traumatic event, but has also been used to capture growth as a result of living with chronic disease (Purc-Stephenson, 2014). The PTGI is based on an empirically-supported five factor structure (Taku, Cann, Calhoun, & Tedeschi, 2008). The PTGI includes 21 items across five domains: Relating to Others, New Possibilities, Personal Strength, Spiritual Change, and Appreciation of Life. Participants rate each item on a Likert-type scale from 0 (did not experience this change as a result of my RA) to 5 (experienced this change to a very great degree as a result of my RA). A total score for the PTGI was used as a measure of posttraumatic growth.

Tedeschi and Calhoun (1996) demonstrated the reliability and validity of the PTGI. A study of 604 undergraduates revealed adequate internal consistency for the total scale score ( $\alpha=.90$ ) and the five subscale scores ( $\alpha=.67-.85$ ). Test-retest reliability for the total scale was also demonstrated in a subsample of 28 undergraduates over the course of two months ( $r=.71$ ). The

five subscales demonstrated inter-correlations ranging from  $r=.27-.52$ . The authors also assessed construct and discriminant validity by examining the relationship between the PTGI, personality variables, and social desirability. The PTGI subscales were found to be positively associated with optimism, religious participation, and personality variables such as extraversion and openness to experience. The authors did not find a relationship between the subscales and social desirability (Tedeschi & Calhoun, 1996).

### **Mindfulness.**

The Five-Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006) was used to assess mindfulness as a trait or psychological construct among participants. The FFMQ is based on a five-factor structure derived from factor analyses of five self-report measures of mindfulness. The five subscales of the FFMQ include: Observing, Describing, Acting with Awareness, Nonjudging of Inner Experience, and Nonreactivity to Inner Experience. These five domains are assessed across a 5-point Likert-type scale from 1 (never or very rarely true) to 5 (very often or always true). A total score for the FFMQ was used as a measure of mindfulness as a trait.

Research has demonstrated the reliability and validity of the FFMQ. Baer et al. (2006) found good internal consistency for the five subscales ( $\alpha=.75-.91$ ) in a group of 613 undergraduates. Construct validity was assessed by examining relationships between the FFMQ, meditation experience, and psychological adjustment in a group of meditators compared to a nonmeditating comparison group (Baer et al., 2008). In the meditating group, the five facets of the FFMQ showed inter-correlations ranging from  $r=.32-.56$ , suggesting the five facets are related but distinct constructs. All five facets were negatively correlated with psychological symptoms in the meditating group ( $r=-.14$  to  $-.58$ ). Meditation experience was significantly

positively correlated with all factors ( $r=.14-.35$ ) except Acting with Awareness ( $r=.04$ ) when controlling for age and education.

### **Meditation Practice.**

Participants were asked to report how many minutes, on average, they spent engaging in meditation over the course of the previous week. Mindfulness was defined as “the practice of turning your attention toward a present moment experience, on purpose, and without judgment,” based on Kabat-Zinn’s (1994) definition of mindfulness. Examples of meditation were also provided, including focusing on the breath, sensations in the body, sounds in the environment, or a word or phrase.

## Chapter IV

### Results

Results of this study are presented, beginning with a description of the study sample. Descriptive statistics for the measures follow, including a comparison of this sample's results to other rheumatoid arthritis (RA) samples. The chapter concludes with findings that correspond to the study research questions.

#### Sample Characteristics

In order to achieve a power of .80 with moderate effect size for the regression analysis, an N of 76 was required. Eighty participants accessed and completed the online survey. Seventeen participants were then excluded because they did not report taking a DMARD, one of the exclusionary criteria. The remaining 63 participants' data were examined for missing responses. No participants missed more than 10% of the items on a measure; a total of 11 participants were missing responses for fewer than 10% of a measure's items. Missing data were replaced with person means for that measure or subscale. Thus, analyses were conducted with the 63 participants who met inclusionary criteria.

Table 1 presents the sample's demographic characteristics. Participants' ages ranged from 24 to 72 ( $M = 51$ ,  $SD = 9.9$ ), and the majority of participants were female (97%). Other studies examining posttraumatic growth in individuals with RA (Dirik & Karanci, 2008; Purc-Stephenson, 2014) had similarly high percentages of women in their samples (85% and 90%, respectively) but reported slightly younger average ages ( $M = 48.5$  and  $45.5$ , respectively). The sample was mostly Caucasian (84%) and married (67%). The majority of participants reported completing at least some college, with 24% of participants reporting receiving a graduate degree. By comparison, only 14% of Purc-Stephenson's (2014) sample reported receiving a graduate

degree, indicating this sample may have had been influenced by their education in unknown ways relevant to PTG or mindfulness. Current employment varied, but 29% of participants reported being unemployed due to disability. Participants reported being diagnosed with RA, on average, 8.36 years ago (.68 – 32.85, *Mdn* = 6.10, *SD* = 7.64).

The majority of participants described themselves as slightly to very religious (73%), while 27% of participants reported not being religious at all. The vast majority of this sample described themselves as slightly to very spiritual (94%). The degree to which religion was involved in how participants cope with stress varied. About a third of the sample (32%) reported religion was not at all involved in how they coped with stress, while 52% of the sample reported religion was somewhat or very involved in coping with stress.

The extent to which participants reported meditating over the past week also varied greatly. About half of the participants reported they did not meditate at all over the past week (*n* = 33, 52%). Participants who meditated during the past week (*n* = 30, 48%) reported spending 2 to 420 minutes meditating (*M* = 81.8, *SD* = 99.2, *Mdn* = 45). Because over half of the sample reported no time spent meditating over the past week, this variable was not included in regression analyses.

### **Descriptive Statistics**

Table 2 summarizes the ranges, means, standard deviations, and Cronbach's alpha for each measure. No outliers were found for any of the measures. The sample's mean score on the total SF-MPQ-2 represents the average amount of pain participants endorsed on each of the scale's 22 items, ranging from 0 ("None") to 10 ("Worst possible").

Table 1. *Demographic Characteristics of the Patient Sample*

VARIABLES	n	%
Sample Size	63	
Gender		
Male	2	3.2
Female	61	96.8
Race/Ethnicity		
White, not of Hispanic or Latino origin	53	84.1
White, Hispanic or Latino origin	5	7.9
Black, African American	3	4.8
Asian, Asian American	1	1.6
American Indian or Alaska Native	1	1.6
Education		
GED	3	4.8
High school diploma	4	6.3
Some college	21	33.3
Associate's degree	6	9.5
Bachelor's degree	7	11.1
Some post-graduate study	7	11.1
Graduate degree	15	23.8
Employment		
Full-time student	3	4.8
Employed part-time	11	17.5
Employed full-time	19	30.2
Retired	10	15.9
Unemployed due to disability	18	28.6
Unemployed for other reasons	2	3.2
Religiosity		
Very religious	7	11.1
Moderately religious	21	33.3
Slightly religious	18	28.6
Not religious	17	27.0
Spirituality		
Very spiritual	16	25.4
Moderately spiritual	27	42.9
Slightly spiritual	16	25.4
Not spiritual	4	6.3
Religion's Involvement in Dealing with Stress		
Very involved	10	15.9
Somewhat involved	23	36.5
Not very involved	10	15.9
Not involved at all	20	31.7

Table 2. *Descriptive Data for Psychometric Instruments*

MEASURE	Range	Mean	SD	Alpha
Pain (SF-MPQ-2)	0-10	3.89	2.19	.94
Mindfulness (FFMQ)	39-195	131.7	21.5	.92
Observe	8-40	26.8	6.1	.81
Describe	8-40	28.2	6.7	.84
Act with Awareness	8-40	27.2	7.7	.92
Nonjudgment	8-40	27.2	7.4	.91
Nonreaction	7-35	22.3	4.3	.76
Posttraumatic Growth (PTGI)	0-105	51.8	22.8	.93
Relating to Others	0-35	16.6	8.9	.85
New Possibilities	0-25	10.1	6.4	.81
Personal Strength	0-20	11.7	5.6	.82
Spiritual Change	0-10	3.4	3.2	.78
Appreciation of Life	0-15	10.0	4.1	.78

Participants endorsed similar average levels of pain on each item ( $M = 3.89$ ,  $SD = 2.19$ ) to a sample of veterans with various chronic pain conditions, including arthritis ( $M = 3.22$ ,  $SD = 2.36$ ; Lovejoy, Turk, & Morasco, 2012). Compared to a sample of patients who reported moderately severe acute low back pain ( $M = 7.5$ ,  $SD = 1.3$ ) and leg pain ( $M = 6.8$ ,  $SD = 1.9$ ; Dworkin et al., 2015), pain severity reported in this sample could be considered moderately low.

The means for the FFMQ total scale and its subscales, presented in Table 2, represent participants' average aggregate score for all FFMQ items included in that scale, with a higher score indicating greater trait mindfulness. The mean total FFMQ score was lower compared to a sample of non-meditating, highly-educated participants without chronic illness ( $M = 137.32$ ) and highly-educated meditators ( $M = 150.02$ ), but higher compared to a sample of non-meditating university students ( $M = 124.34$ ) and non-meditating community members ( $M = 116.9$ ; Baer et al., 2008), indicating moderate levels of trait mindfulness. Table 3 presents a comparison of the means for each subscale of the FFMQ in this sample versus a Dutch sample of fibromyalgia

patients (Veehof, ten Klooster, Taal, Westerhof, & Bohlmeijer, 2011). The mean score of the FFMQ total scale was not reported in the comparison sample. T-tests revealed this sample reported similar levels of trait mindfulness across all subscales of the FFMQ except Act with Awareness. Participants in this sample reported slightly more acting with awareness than participants in the comparison sample ( $t(202) = 2.05, p = .04$ ). Participants reported the highest levels of mindfulness in the area of describing ( $M = 28.2$ ), a subscale that measures the ability to describe an experience (e.g., thoughts, feelings) with words. The lowest levels of mindfulness were reported in the nonreaction area ( $M = 22.3$ ), a subscale that assesses the ability to be nonreactive toward certain thoughts, feelings, and situations, particularly those that are distressing.

Table 3. Scores for FFMQ Comparisons

<u>Measures</u>	<u>Sample</u>			<u>Veehof et al., 2011</u>			<u>T test</u>	
	N	M	SD	N	M	SD	T	Sig.
FFMQ								
Observe	63	26.8	6.1	141	27.7	4.6	1.16	$p > .05$
Describe		28.2	6.7		27.3	6.5	.91	$p > .05$
Act with Awareness		27.2	7.7		25.1	6.3	2.05	$p < .05$
Nonjudgment		27.2	7.4		26.4	6.8	.76	$p > .05$
Nonreaction		22.3	4.3		21.7	4.2	.94	$p > .05$

Finally, Table 2 presents the means scores for the PTGI total and subscales. Similar to the FFMQ, the mean scores represent the average aggregate score for all PTGI items included in that scale, with higher scores indicating greater growth. Participants reported a level of posttraumatic growth ( $M = 51.8, SD = 22.8$ ) that has been described as moderate in previous research (Purc-Stephenson, 2014). The largest reported area of growth for this sample was greater appreciation of life ( $M = 10.0$ ), while the smallest was spiritual change ( $M = 3.4$ ). All measures and subscales demonstrated satisfactory internal consistency reliability.

## Research Questions

The first research question involved participants' reported levels of posttraumatic growth. A series of t-tests were conducted to compare this sample's PTG levels to other RA samples' reported PTG. Table 4 summarizes the sample sizes, means, and standard deviations of PTG reported in this and other RA samples. Assuming equal variances, participants' overall PTG in this study did not differ significantly from PTG reported in Dirik and Karanci's (2008) sample ( $t(178) = 0.02, p = .99$ ) or Purc-Stephenson's (2014) sample ( $t(362) = 0.45, p = .65$ ). Dirik and Karanci (2008) did not report PTG totals for the five subscales assessed in this study, but compared to Purc-Stephenson's (2014) subscale scores, this sample reported significantly higher appreciation of life ( $t(362) = 3.19, p = .002$ ). In sum, this sample reported moderate overall levels of PTG, similar to other samples of individuals with RA. This sample also reported significantly higher appreciation of life compared to another RA sample.

Table 4. *Scores for PTGI Comparisons*

Measures	Sample			Dirik & Karanci, 2008			Purc-Stephenson, 2014			T test	
	N	M	SD	N	M	SD	N	M	SD	T	Sig.
PTGI Total	63	51.8	22.8	117	51.86	25.91	301	50.20	25.92	.02 <sup>1</sup>	$p > .05$
										.45 <sup>2</sup>	$p > .05$
Relating to Others		16.6	8.9					17.49	9.29	.70	$p > .05$
New Possibilities		10.1	6.4					10.90	6.75	.86	$p > .05$
Personal Strength		11.7	5.6					10.36	5.57	1.73	$p > .05$
Spiritual Change		3.4	3.2					3.34	3.51	.13	$p > .05$
Appreciation of Life		10.0	4.1					8.11	4.32	3.19	$p < .01$

Note.

<sup>1</sup> = This sample compared to Dirik and Karanci (2008).

<sup>2</sup> = This sample compared to Purc-Stephenson (2014).

The second research question pertained to the relationship between posttraumatic growth and trait mindfulness. Table 5 presents the correlations among this study's measures. Contrary to this study's hypothesis, overall PTG and trait mindfulness were not significantly correlated. In addition, although some research has indicated there may be a negative relationship between overall PTG and the nonjudgment facet of mindfulness (Chopko & Schwartz, 2009; Hanley et al., 2014), no significant correlations were found between the PTGI's and FFMQ's subscales.

Overall PTG was not significantly related to time since diagnosis ( $r = .063, p = .62$ ), contrary to other research suggesting a significant, positive relationship between PTG and time since diagnosis (e.g., Zernicke et al., 2014). Overall PTG was significantly, positively correlated with pain severity, which was unexpected. Several subscales of the PTGI were also positively correlated with pain severity, including relating to others, new possibilities, and appreciation of life. In addition, unexpectedly, trait mindfulness was negatively correlated with pain severity. Two subscales of the FFMQ were also negatively correlated with pain severity: acting with awareness, and nonjudgment. In sum, although PTG and trait mindfulness were not significantly related, both PTG and mindfulness were significantly related to participants' reported pain severity.

The third question related to the extent to which trait mindfulness explained variance in this sample's overall posttraumatic growth. A hierarchical regression analysis was conducted with demographic variables (i.e., age and gender) entered into the first step. Disease variables, which included time since diagnosis and pain severity measured by the SF-MPQ-2, were entered into the second step. Finally, trait mindfulness, measured by the FFMQ, was entered into the final step. The dependent variable was PTG, represented by total PTGI scores. Each step in the regression model was evaluated based on whether the added variables predicted a significant

portion of variability in the outcome of interest (i.e., a significant change in  $R^2$  value, and overall model F-value.) A summary of the regression equation is presented in Table 6.

The demographic variables in Step 1 did not significantly account for variance in PTG ( $R^2 = .03, p = .39$ ); the overall model was also not significant ( $F(2,60) = .96, p = .39$ ). After accounting for demographic variables, the regression model at Step 2 significantly accounted for an additional 13% of the variance in PTGI ( $p = .02$ ). The overall regression model including demographic and disease related variables was also significant ( $F(4,62) = 2.79, p = .04$ ). Pain severity significantly contributed to the model at Step 2, but time since diagnosis did not. Finally, after controlling for demographic and disease variables, the model at Step 3 was not significant as indicated by the non-significant change in  $R^2$  ( $p = .61$ ) and model F-values ( $F(5,62) = 2.26, p = .06$ ). Pain severity contributed significantly to the model at Step 3, but trait mindfulness did not.

### **Supplemental Analyses**

A supplemental analysis was performed to compare the means between meditating and non-meditating participants on two measures of interest. A MANOVA was conducted to compare PTGI and FFMQ scores between the two groups. Participants who did not meditate reported an average total score of 55.08 ( $SD = 23.28$ ) on the PTGI and 129.62 ( $SD = 19.10$ ) on the FFMQ. Participants who spent some time meditating over the past week reported an average total score of 48.27 ( $SD = 22.20$ ) on the PTGI and 141.10 ( $SD = 24.28$ ) on the FFMQ. MANOVA results indicated no significant differences between the two groups on posttraumatic growth ( $F(2, 60) = 1.40, p = .24$ ). However, results did indicate that the meditating group reported significantly more trait mindfulness than the non-meditating group ( $F(2, 60) = 4.39, p = .04$ ).

Table 5. *Selected Correlations among Variables*

Scale	1	2	3	4	5	6	7	8	9	10	11	12	13
1. SF-MPQ-2	—												
2. FFMQ Total Scale	-.27*	—											
3. FFMQ Observe	.03	.44**	—										
4. FFMQ Describe	-.12	.75**	.30*	—									
5. FFMQ Act with Awareness	-.27*	.77**	-.02	.50**	—								
6. FFMQ Nonjudgment	-.31*	.72**	.01	.29*	.62**	—							
7. FFMQ Nonreaction	-.19	.57**	.37**	.45**	.23	.16	—						
8. PTGI Total Scale	.36**	-.02	-.06	-.09	.04	.03	-.03	—					
9. PTGI Relating to Others	.36**	.03	-.06	.05	.04	.04	-.01	.88**	—				
10. PTGI New Possibilities	.37**	-.10	-.12	-.19	-.03	.01	-.05	.89**	.71**	—			
11. PTGI Personal Strength	.10	.07	-.08	-.11	.14	.14	.08	.81**	.59**	.69**	—		
12. PTGI Spiritual Change	.18	.04	-.01	.00	.19	-.02	-.13	.59**	.44**	.41**	.34**	—	
13. PTGI Appreciation of Life	.33**	-.15	.08	-.14	-.19	-.14	-.07	.72**	.50**	.59**	.49**	.43**	—

*Note.* SF-MPQ-2 = Short-Form McGill Pain Questionnaire 2; FFMQ = Five Facet Mindfulness Questionnaire; PTGI = Posttraumatic Growth Inventory

\* $p < .05$ ; \*\* $p < .001$

Table 6. *Hierarchical Regression Analysis of Mindfulness Explaining Variance in Posttraumatic Growth*

Variable	$\beta$	<i>B</i>	<i>SE</i>	<i>F</i>	<i>R</i> <sup>2</sup>	$\Delta R^2$
Step 1				<b>.96</b>	<b>.03</b>	<b>.03</b>
Age	.12	.28	.30			
Gender	-.11	-14.06	16.68			
Step 2*				<b>2.79*</b>	<b>.16</b>	<b>.13*</b>
Age	.08	.18	.29			
Gender	-.10	-12.79	15.96			
Time Since Diagnosis	.10	.03	.03			
Pain Severity (SF-MPQ-2)	.36**	.17	.06			
Step 3				<b>2.26</b>	<b>.17</b>	<b>.00</b>
Age	.08	.18	.29			
Gender	-.09	-11.30	16.32			
Time Since Diagnosis	.10	.03	.03			
Pain Severity (SF-MPQ-2)	.38**	.18	.06			
Mindfulness (FFMQ)	.07	.07	.13			

*Note.* \*  $p < .05$ , \*\*  $p < .01$ .

## **Chapter V**

### **Discussion**

The results of this study are discussed, including a comparison of this study's findings to extant literature. Study limitations are also presented. Suggestions for further research are explored, as well as implications for clinical practice. The discussion concludes with summarizing remarks.

#### **Results Discussion**

The purpose of this study was to investigate the presence of posttraumatic growth in individuals with RA. This study also explored the relationship between PTG and mindfulness in RA patients. Results of this study indicate that individuals with RA do report PTG as a result of living with RA, but mindfulness does not appear to be related to PTG for this population. Instead, pain severity was significantly related to both PTG and trait mindfulness for this sample.

#### **PTG and RA.**

The primary purpose of this study was to identify posttraumatic growth in individuals with RA. Growth beyond premorbid levels of functioning in people with RA is a nascent area of research, but, as noted previously, there is some evidence to suggest RA patients experience personal growth as a result of navigating their disease. Two previous studies of PTG and RA demonstrated that individuals with RA report moderate levels of growth (Dirik & Karanci, 2008; Purc-Stephenson, 2014). As a result, this author expected participants to report PTG as a result of living with RA.

Participants in this sample reported moderate levels of PTG, consistent with previous research. Participants reported the most growth in the Appreciation of Life domain; they reported the least growth in the Spiritual Change domain. Compared to Purc-Stephenson's (2014) sample of RA patients, this sample reported significantly more appreciation of life. It may be the case

that because this study's participants were recruited from an online support group for RA, participants had greater exposure to others' stories of living with RA, and subsequently may have developed a greater appreciation of their own lives. Similarly, however, Purc-Stephenson's (2014) sample also reported the most growth within the Appreciation of Life domain and the least growth in the Spiritual Change domain.

Similarities between this sample's reported PTG and reported PTG from a previous study of people with RA reveal several key considerations. First, individuals do appear to experience PTG as a result of living with RA. In addition, growth experienced as a result of living with RA appears to occur most frequently in the form of greater appreciation of life. Appreciation of life is represented in the PTGI through three statements: 1) I changed my priorities about what is important in life, 2) I have a greater appreciation for the value of my own life, and 3) I can better appreciate each day. People diagnosed with chronic disease often go through an adjustment process that has been described as "the healthy rebalancing [of people's lives] to their new circumstances" (De Ridder, Geenen, Kuijer, & van Middendorp, 2008, p. 246). People with RA may experience both the greatest distress and the greatest growth through this process of rebalancing to accommodate their symptoms and disease management.

Similarities in the way samples of RA patients have reported PTG also reveal that the least growth may be experienced in the Spiritual Change domain. Spiritual change is assessed on the PTGI through two items: 1) I have a better understanding of spiritual matters, and 2) I have a stronger religious faith. There may be several reasons for this finding. First, smaller changes in spirituality for this sample may be a reflection of demographic characteristics. Only 11% of this sample identified as very religious, with 27% of the sample identifying as not religious at all. Further, 32% of the sample reported that religion is not involved at all in how they deal with

stress. Additional studies of PTG in individuals with RA may help determine if smaller changes in spirituality are a reflection of unique sample characteristics or the nature of growth experienced after RA more generally. It may also be the case that because RA is not a life-threatening illness, people with RA are less likely to rely on religion and spirituality to cope, compared to people diagnosed with life-threatening illnesses that may raise questions about life after death.

Overall PTG reported in this sample was also compared to PTG reported in samples of people with other illnesses. Notably, participants in this sample reported less PTG than samples of individuals with other chronic disease, such as irritable bowel disease ( $M = 54.95$ ,  $SD = 23.80$ ; Purc-Stephenson, 2014) and HIV ( $M = 63.3$ ,  $SD = 26.7$ ; Zeligman et al., 2016). Given the assumption that a life event must be distressing enough to challenge an individual's understanding of the world or him or herself for PTG to occur (Tedeschi & Calhoun, 1996), RA may be perceived as having less of an impact on an individual's sense of self and the world compared to other chronic disease.

Finally, posttraumatic growth was found to be significantly related to pain severity, such that higher levels of pain were correlated with higher levels of PTG. This finding is consistent with other studies suggesting individuals with chronic disease who report more disease-related distress will also reported more PTG compared to individuals who report less illness distress (e.g., Purc-Stephenson, 2014). This relationship suggests people with more pain as a result of their RA may perceive RA as having a greater impact on their views of the world and self, in both positive and negative ways.

## **Mindfulness and RA.**

To this author's knowledge, this study was the first to assess trait mindfulness in a sample of people with RA using the Five Facet Mindfulness Questionnaire (FFMQ), and thus, comparisons of participants' FFMQ scores to other RA samples' scores were not possible. Compared to a Dutch sample of people with fibromyalgia (Veehoff et al., 2011), participants in this sample reported more mindfulness in the Act with Awareness domain. No significant differences were found across the other domains of mindfulness between this study's sample and Veehoff and colleagues' (2011) sample of people with fibromyalgia, suggesting the two samples reported mostly similar levels of trait mindfulness.

Acting with awareness was assessed on the FFMQ through reverse-scored items related to distraction (e.g., "I find myself doing things without paying attention."), such that low scores on these items indicated more mindfulness in the Act with Awareness domain. This sample's comparatively higher level of acting with awareness may be related to the study's recruitment method; people with RA who routinely write about their RA experiences may also have more awareness of their experiences. Generalizations about differences between people with RA and fibromyalgia within the Act with Awareness domain of mindfulness should be made with caution, given the limited data available for comparison. However, it may be worth exploring whether people with fibromyalgia experience more difficulty with distraction than people with RA.

Participants in this sample reported the most trait mindfulness within the Describe domain, assessed by items related to participants' ability to use language to describe their thoughts, feelings, sensations, and experiences (e.g., "I'm good at finding words to describe my feelings."). This finding may also be related to this sample's use of online support groups to

describe their RA experience. Conversely, participants reported the least trait mindfulness in the Nonreaction domain of the FFMQ. Nonreaction was assessed through statements related to noticing distressing internal or external experiences without reacting to them (e.g., “When I have distressing thoughts or images, I just notice them and let them go.”) Participants’ lower scores within this domain may be interpreted as a function of RA. It may be difficult to be in the presence of pain and related, unpleasant thoughts and emotions without reacting to them. Additional research in this area may help illuminate if lower scores in the Nonreaction domain are typical of people with RA, or if they were just specific to this sample.

One unexpected finding of this study was the negative relationship between mindfulness and pain severity: participants who reported more pain also reported less trait mindfulness. One study of chronic pain patients receiving extended opioid pharmacotherapy found a negative relationship between pain interference and the Nonjudgment and Awareness subscales of the FFMQ, but found no significant relationship between pain severity and overall mindfulness (Thomas & Garland, 2017). The difference in this study’s findings may be attributed to using a different measure of pain, or they may indicate a unique relationship between pain severity and mindfulness within the context of RA. It may be the case that for people with RA, it is more difficult to be aware of and accepting toward present moment experiences as pain becomes more severe. More research is necessary to understand the relationship between RA patients’ pain severity and trait mindfulness.

Finally, meditators reported greater levels of trait mindfulness compared to non-meditators, which may suggest that an individual’s trait mindfulness can be increased through formal mindfulness practice. A recent review of the literature on the effects of mindfulness-based interventions on health and social care undergraduates found that mindfulness-based

interventions increased students' overall trait mindfulness (O'Driscoll, Byrne, McGillicuddy, Lambert, & Sahn, 2017), lending support to the suggestion that trait mindfulness may be increased through mindfulness interventions. These findings suggest formal mindfulness training may increase trait mindfulness among people with RA, as well.

### **PTG, Mindfulness, and RA.**

Another aim of this study was to examine the relationship between posttraumatic growth and mindfulness in individuals with RA. To the best of this author's knowledge, the relationship between PTG and mindfulness had not been examined in people with RA prior to this study. Previous studies suggested overall PTG and mindfulness may be positively correlated, while the "nonjudgment" subdomain of mindfulness may be negatively associated with PTG (Chopko & Schwartz, 2009; Hanley et al., 2014). Further, some studies indicated mindfulness-based interventions have a positive effect on PTG for people with cancer (e.g., Labelle et al., 2015). As such, PTG was hypothesized to be positively associated with mindfulness in this sample of people with RA, while nonjudgment was hypothesized to be negatively associated with overall PTG.

Contrary to this hypothesis, this study found no significant relationship between PTG and trait mindfulness. In addition, no significant relationship was found between PTG and the Nonjudgment subscale of the FFMQ. Regression analyses indicated trait mindfulness did not explain variance in PTG above and beyond demographic and disease variables. Regression analyses also revealed the only variable that significantly accounted for variance in PTG was pain severity.

Several, tentative hypotheses may be generated from these findings. First, the two studies that found a positive correlation between PTG and trait mindfulness, and a negative correlation

between PTG and the nonjudgment facet of mindfulness, were conducted with samples of survivors of various traumatic events (Hanley et al., 2015) and first responders to traumatic incidents (Chopko & Schwartz, 2009). The results of this study may suggest that the relationship between PTG and mindfulness is not consistent across traumatic or distressing events. It may be that PTG and mindfulness were not related because of the way growth is experienced or generated among people with RA, specifically. It may also be a reflection of RA's chronicity, as opposed to the acute nature of trauma experienced by participants in the two aforementioned studies.

The non-relationship between PTG and mindfulness in this study may also be a reflection of the extent to which RA is perceived as a traumatic event. In response to Garland and colleagues' (2015) proposed *mindfulness-to-meaning theory*, Tedeschi and Blevins (2015) encouraged researchers to consider how the severity of the trauma influences the extent to which survivors engage in the mindful, cognitive-emotional mechanisms that are proposed to facilitate growth. They argued that a certain degree of distress is required to prompt the intrusive and deliberate rumination required of the positive reappraisal process. The authors also suggested that for certain vulnerable populations, or when trauma severity reaches a certain threshold, intense, mindful engagement with internal experiences related to the trauma may lead to greater distress, not growth. How, then, does mindfulness practice interact with PTG when the trauma is considered less severe?

As mentioned earlier, people with RA appear to report less PTG than people with other chronic disease, which may be a function of RA being perceived as less disruptive to an individual's life compared to other chronic disease or health-related trauma. If RA is perceived as less severe on the spectrum of traumatic or distressing events, then perhaps the processes that

facilitate PTG are influenced more strongly by factors other than mindfulness. One such factor, as indicated by this study, may be pain severity. For people with RA, higher levels of pain may be a stronger influence on whether an individual with RA engages in the ruminative processes required of PTG than the individual's dispositional mindfulness. Future research may clarify other factors that contribute to the process of experiencing growth as a result of living with RA.

### **Meditators v. Non-Meditators.**

As previously reported, a little over half the sample reported spending no time meditating over the past week, versus 48% of the sample who reported meditating anywhere from 2 to 420 minutes. A MANOVA revealed no differences between the meditating and non-meditating groups regarding mean PTG. This finding is consistent with other analyses within the study indicating no significant relationship between mindfulness and PTG. The MANOVA did reveal a significant difference between meditators and non-meditators on mean trait mindfulness, such that meditators reported significantly more trait mindfulness than non-meditators.

Hanley and colleagues (2015) compared reported PTG and trait mindfulness among contemplative mindfulness practitioners versus non-practitioners in a sample of trauma survivors. Similar to the results of this study, contemplative practitioners reported greater trait mindfulness than non-practitioners. Dissimilar to this study, however, contemplative practitioners in Hanley and colleagues' sample also reported greater PTG than non-practitioners. Similar to trait mindfulness, then, meditation may not have a significant impact on the experience of PTG for people with rheumatoid arthritis.

In sum, these findings point to the importance of working toward a greater understanding of PTG in RA patients, as well as the importance of developing a more contextual understanding of the relationship between PTG and mindfulness.

## **Study Limitations**

Limitations of this study may be considered when interpreting the study's findings. First, participants were recruited from various online support groups for RA. Given each participant sought out an online support group, it may be the case that this sample was more affected by their RA compared to individuals with RA who did not seek online support. Further, individuals in these groups who chose to participate may have had an interest in personal growth or mindfulness, which may have skewed the results toward more growth and mindfulness compared to the general RA population.

Second, this study required participants to complete an online survey, which means all participants must have had access to a computer and time to complete the survey. These requirements may have implications for some sample characteristics, such as the sample's education level or current employment, and this sample did appear to have a large number of people with graduate degrees. The online survey method may also have restricted participation to individuals with less pain, as those with more severe pain, particularly in the hands and wrists, may have been reluctant to participate. Although 80 individuals elected to take the survey, only 63 participants met inclusionary criteria, which was short of the number of participants needed for adequate power ( $n = 76$ ). Therefore, results should be interpreted with caution. Low power reduces this study's chances of detecting important relationships.

Third, participants' self-reported diagnoses of RA were not corroborated by a physician. Therefore, some participants may have self-diagnosed their RA, as opposed to being diagnosed by a physician. This limitation was addressed, in part, by including a checklist of disease-modifying anti-rheumatic drugs (DMARDs) in the survey; participants must have reported taking at least one DMARD for inclusion. Previous research indicates the positive predictive

value of confirmed RA increases when individuals who self-report RA also report taking one or more DMARDs (Formica et al., 2010), but this criterion does not guarantee all participants were diagnosed by a physician. The validity of this study's results are bolstered, however, by similarities reported by this sample compared to other RA and chronic pain samples along measures of pain, PTG, and mindfulness. Demographic characteristics of this sample were also similar to other RA sample characteristics.

Another limitation of this study was the assessment of meditation. Meditation is a difficult variable to assess, given various definitions and styles of meditation. Although a definition of meditation was provided to participants, participants may have had different understandings of what constitutes meditation. Some participants may have had formal meditation training, while others may be self-taught. Participants were also asked to report how many minutes over the past week they spent meditating, which may have been difficult to accurately estimate. Further, slightly over half of the sample reported they spent no time meditating at all, rendering this variable not useful in regression analyses.

Finally, because this study is cross-sectional in nature, the findings only capture the relationship between pain, posttraumatic growth, and mindfulness at a specific point in time. Therefore, this study cannot illuminate variables that are predictive of PTG in people with RA. The purpose of this study, however, was not to predict PTG, but rather to add to a base of evidence that suggests people do experience PTG as a result of living with RA, and to begin exploring the relationship between PTG and mindfulness for this specific population.

### **Implications for Research**

Researchers may add to this body of literature by making modifications to their study design. A longitudinal study of variables related to PTG may illuminate factors that are

predictive of PTG in people with RA over time. Participants may also be limited to people whose RA diagnoses are corroborated by a physician to ensure the validity of results. If participants are recruited from support groups, PTG may be compared across the groups to determine if PTG varies according to group differences. Using interview methods may also expand inclusion to participants with more severe pain, who would not opt to participate in an online survey. In addition, more data about meditation may be gathered to more accurately assess participants' style of meditation, such as whether participants have received formal meditation training, or the type of meditation participants practice. Finally, since participants in this sample were diagnosed with RA a relatively long time ago ( $M = 8.36$  years,  $SD = 7.64$ ), it may be interesting to examine PTG in individuals who were diagnosed with RA more recently.

As Purc-Stephenson (2014) has argued, PTG is not only experienced by individuals who have experienced an acute trauma or life-threatening illness. This study contributes to a small body of literature demonstrating that people with nonlife-threatening chronic disease also experience PTG. As such, researchers may continue to compare levels of PTG across myriad chronic pain and disease populations to develop a more nuanced understanding of PTG. Researchers may also continue to broaden our understanding of the contexts in which PTG occurs by assessing for PTG as a result of contending with other chronic conditions not typically conceptualized as trauma (e.g., chronic food insecurity, race-related stress).

Since it appears individuals experience PTG as a result of living with RA, clinicians may benefit from research that investigates other variables associated with PTG in RA patients. This study found no significant relationship between mindfulness and PTG among individuals with RA, but other coping practices may be assessed as possible contributors to PTG. For example, researchers could assess the degree to which Fredrickson's (2004) broaden-and-build theory may

facilitate the cognitive processes necessary to generate PTG for people with RA. An application of the broaden-and-build theory to the generation of PTG may suggest that people with RA who engage in distracting activities that spark positive emotions will develop broadened mindsets that encourage play and exploration. The discovery of novel actions or relationships as a result of this exploration will build the individual's resources, which may facilitate PTG. Variables such as social support may also be assessed as contributors to PTG in people with RA. Finally, researchers may continue to examine the relationship between PTG and indicators of physical and psychological well-being, such as mood, self-esteem, pain interference, and disease activity.

Last, although the primary focus of this study was PTG in people with RA, the study's findings illuminate the complexity of relationship between mindfulness and PTG. As noted previously, although most research indicates mindfulness-based interventions have a positive impact on PTG in cancer patients (e.g., Hawkes et al., 2014), at least one study found no significant relationship between mindfulness-based interventions and PTG for cancer patients (Zernicke et al., 2014). Fewer studies still have examined the relationship between trait or dispositional mindfulness and posttraumatic growth. To this author's knowledge, this study is the first examination of trait mindfulness and posttraumatic growth in a sample of individuals with chronic disease.

Thus, there are at least three important implications for research on the relationship between mindfulness and PTG. First, mindfulness-based interventions and trait mindfulness may have different relationships with posttraumatic growth. Given that mindfulness-based interventions offer a new way of coping with individuals with illness, it may follow that mindfulness-based interventions also facilitate growth as a result of living with an illness. Trait mindfulness, on the other hand, may or may not be implicated in the way a person copes with their illness. In sum,

research may continue to examine the differences between mindfulness-based interventions and trait mindfulness in relation to PTG.

Second, the relationship between mindfulness and PTG cannot be generalized across populations of trauma survivors or individuals with illness. Much in the same way that PTG varies across trauma and illness experiences, the relationship between mindfulness and PTG may also vary across contexts. Finally, future research may look at the way meditation influences the relationship between trait mindfulness and PTG. It may be the case that meditation moderates the relationship between trait mindfulness and PTG. Understanding the nuance in the relationship between mindfulness and PTG may help clinicians tailor interventions to maximize opportunities for growth in clients with diverse trauma and illness.

### **Implications for Clinical Practice**

The findings of this study offer several implications for clinicians working with people with RA. First, it appears people with RA experience PTG, and research has demonstrated positive adaptation to RA above and beyond premorbid levels of functioning is associated with indicators of physical and psychological well-being (e.g., Danoff-Burg & Revenson, 2005). As such, clinicians may be mindful to help clients facilitate opportunities for growth following a diagnosis with RA.

Tallman and Hoffman (2017) reviewed ways clinicians may facilitate growth for individuals with acquired disabilities, which may be applied to work with clients who have been diagnosed with life-altering diseases. Calhoun and Tedeschi (2012) suggested clinicians take on the role of “expert companions” who help survivors create new life narratives in the aftermath of trauma. An expert companion is someone who offers “some expertise in nurturing naturally occurring processes of healing and growth” (Calhoun & Tedeschi, 2012, p. 23).

In working with clients who have RA, expert companions would be mindful to choose words that reflect that growth comes from the struggle to cope with the symptoms of RA, rather than from the RA itself. Clinicians adopting an expert companion role would also attend carefully to themes of growth when talking to clients with RA, helping the client identify growth if it is present. Given this study's finding that individuals with RA who experienced more pain also experienced more growth, clinicians may be particularly sensitive to themes of growth within the narratives of clients who report more pain. Finally, expert companions strive to listen to narratives about life with RA without attempting to solve all the client's problems.

### **Conclusion**

This study adds to a small body of literature demonstrating that individuals with RA experience PTG as a result of navigating their disease. Contrary to other studies of the relationship between trait mindfulness and PTG, this study suggests there may not be a relationship between trait mindfulness and PTG in individuals with RA. Pain severity, however, appears to have a significant relationship to both PTG and mindfulness for RA patients, such that greater pain is related to greater growth and less trait mindfulness. The results of this study suggest the merit of continuing to examine factors associated with PTG for this population. The relationship between posttraumatic growth and mindfulness may also merit further exploration. Finally, clinicians may be mindful to take on the role of expert companions to help clients with RA facilitate opportunities for growth in the presence of this difficult disease.

## **Appendix A**

### **Informed Consent**

We invite you to participate in a research study being conducted by investigators from The University of Iowa. The purpose of the study is to understand how people experience personal growth as a result of living with rheumatoid arthritis (RA).

If you agree to participate, you will complete a survey that asks questions about your RA pain, experiences of personal growth as a result of living with chronic pain, and the extent to which you are mindful of your present moment experiences. You are free to skip any questions that you prefer not to answer. The estimated time to complete this survey is 15 to 30 minutes.

All surveys will be conducted anonymously. We will not collect your name or any identifying information about you. It will not be possible to link you to your responses on the survey. Data collected will be stored in a password-protected file on a designated flash drive, which will be kept in the researcher's locked file cabinet for three years, then deleted. Only members of the research team will have access to the data.

Taking part in this research study is completely voluntary. If you do not wish to participate in this study, you can choose not to complete the survey or any of the questions. You are free to withdraw from the study at any time without penalty. Please feel free to ask any questions of the investigator before beginning the study, and at any time during the study. To give your consent to participate in the study, click on the forward button below. By clicking the forward button, you are agreeing to participate in the research study entitled "Mindfulness and Posttraumatic Growth in Individuals with Rheumatoid Arthritis" and agreeing that the study has been explained to you and your questions have been answered to your satisfaction.

If you have questions about the rights of research subjects, please contact the Human Subjects Office, 105 Hardin Library for the Health Sciences, 600 Newton Rd, The University of Iowa, Iowa City, IA 52242-1098, (319) 335-6564, or e-mail [irb@uiowa.edu](mailto:irb@uiowa.edu).

Thank you very much for your consideration of this research study.

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**Appendix B**  
**Demographic Questionnaire**

1. Gender:

- Male
- Female
- Transgender
- Gender nonbinary

2. Race:

- White, not of Hispanic or Latino origin
- White, Hispanic or Latino origin
- Black, African American
- Asian, Asian American
- American Indian or Alaska Native
- Native Hawaiian or Other Pacific Islander

3. What is your highest level of education?

- GED
- High school diploma
- Some college
- Associate's degree
- Bachelor's degree
- Some post-graduate study
- Graduate degree

4. What is your employment status?

- Part-time student
- Full-time student
- Employed part-time
- Employed full-time
- Retired
- Unemployed due to disability
- Unemployed for other reasons

5. What is your marital status?

- Single
- Partnered
- Married
- Divorced
- Widowed

6. To what extent do you consider yourself a religious person?

- Very religious
- Moderately religious
- Slightly religious
- Not religious at all

7. To what extent do you consider yourself a spiritual person?

- Very spiritual
- Moderately spiritual
- Slightly spiritual
- Not spiritual at all

8. To what extent is your religion involved in understanding or dealing with stressful situations in any way?

- Very involved
- Somewhat involved
- Not very involved
- Not involved at all

9. When were you diagnosed with rheumatoid arthritis? (mm/yyyy)

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