Positive and Negative Life Changes in Individuals with Tinnitus and Rheumatoid
Arthritis

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Abstract

BACKGROUND: There has been a growing interest in the study of negative and positive life changes that individuals report as a result of adversities. Positive life changes have been reported in a variety of circumstances (i.e. bereavement, chronic illness and sexual assault). There are inconsistencies in the literature as to the association between positive life changes and adjustment (i.e. associated with better adjustment outcomes, worse outcomes and unrelated to adjustment). These inconsistencies suggest that positive life changes may relate indirectly to adjustment by moderating the relationship between negative life changes and adjustment. The inconsistencies have also caused some to question the veracity of reported positive life changes. **METHODS:** The present study examined positive and negative life changes in two separate illness samples using an Internet study of individuals with tinnitus ($n = 184$) and individuals with rheumatoid arthritis ($n = 215$). **OBJECTIVES:** The objectives of the current study were to investigate whether positive life changes moderate the relationship between negative life changes and each of the adjustment variables (depression, positive emotionality) and to investigate the veracity of reported positive life changes by looking at the relationship between positive life changes, negative life changes and two separate facets of social desirability (impression management and self-deception). Time since illness onset was also investigated in regards to the above relationships. **RESULTS:** Analysis revealed a PositiveXNegativeXTime interaction for positive emotionality. High positive life changes buffered the effects of negative life changes on adjustment within the first 7 years of coping with an illness, rather than after 7 years. A PositiveXTime interaction was found for self-deception, in that higher positive life changes were associated with higher self-

deception when time since illness onset was greater than 7 years. Within the first 7 years of an illness, positive life changes were unrelated to self-deception. A PositiveXNegative interaction was found for impression management. Negative life changes buffered the positive relationship between positive life changes and impression management.

CONCLUSION: The results suggest that positive life changes appear to buffer the ill effects of negative life changes on positive emotionality within the first 7 years of an illness only. Results also suggest that the veracity of positive life changes depends upon the extent that negative life changes are also reported. The nature of the relationships between positive and negative life changes, and adjustment and social desirability depend upon the amount of time that has passed since the onset of an adversity. Measuring the extent to which individuals report both positive and negative life changes is essential in the study of life changes after adversity as the veracity of positive life changes depends upon the extent that an individual report negative life change as well. Limitations and future directions are discussed.

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Contemporary theories of adjustment to adversities suggest that the study of psychosocial factors is necessary in understanding adjustment to threatening circumstances. One common adversity that many individuals face is chronic illness. A variety of factors have been studied in relation to adjustment to chronic illness in past research. Examples of such factors include: perceived control (e.g. Helgeson, 1992), hardiness (e.g. Pollock, Christian & Sands, 1990), acceptance of illness (e.g. Evers et al, 2001), self-efficacy (e.g. Prior & Bond, 2004) and social support (e.g. Gallant, 2003). Others have looked at adjustment to illness from a stress and coping framework (Ben-Sira, 1984; Carver & Scheier, 1994; Felton, Revenson, & Heinrichsen, 1984; Folkman, 1997).

Taylor (1983) has proposed a model of cognitive adaptation to threatening events (including chronic illness) and has argued that adjustment centers around three factors: searching for meaning in the experience, gaining a sense of mastery over the illness and the enhancement or restoration of self-esteem. The search for meaning in one's experience is particularly salient in individuals with chronic illness as they are forced to redefine the meaning of everyday life as a response to its disruption as a result of the illness (Fife, 1995). One way that individuals find meaning in adversity is by finding positive aspects or outcomes of their adversity (Davis, Nolen-Hoeksema & Larson, 1998). Some have asserted that in order to experience positive results from adversity, a stressful life event or trauma must be significant enough to challenge one's assumptions about the world and one's self (Janoff-Bulman, 1992; Tedeschi & Calhoun, 1995). A cold, for example, is not expected to be significant enough to challenge implicit assumptions. Chronic illness, on the other hand, is a situation that presents significant challenges for an

individual and can be very stressful and life-altering. Those with chronic illness experience multiple losses (i.e. loss of independence, social life/friends) that can be highly distressing.

The present study will examine adjustment to two separate illnesses, tinnitus and rheumatoid arthritis (RA), in relation to the negative and positive life changes (changes to how one sees oneself, others and the world) individuals may report as a result of their illness. As shall be later discussed, there are mixed results in the literature as to the relationship between positive life changes and adjustment. These mixed results have caused some to question whether the positive life changes individuals report are veridical or whether they represent illusions or attempts at self-enhancement (e.g. McFarland & Alvaro, 2000; Wortman, 2004); therefore a second focus of the present study is to examine the veracity of these reported positive life changes.

A brief background about tinnitus and RA will first be discussed. These two illnesses were chosen for the purposes of the present study because they represent illnesses significant enough to cause distress and potential adjustment problems (i.e., they are more serious than a temporary cough or cold) and warrant meaningful life change while at the same time remaining common, accessible, and available for study. Additionally, two separate illnesses were chosen to enhance generalizability of any findings. Secondly, a discussion of the relationships between positive and negative life changes and adjustment to adversity will be conducted. This will then be followed by a discussion about the meaning and veracity of reported positive life changes.

Tinnitus

Tinnitus, is the perception of sound in the ears or head in the absence of external stimuli (Andersson, 2002). Epidemiological studies have suggested that up to 18% of the adult population in the U.S. experience tinnitus (Budd & Pugh, 1995) and is it more common in males than females (Sanchez, 2004). Tinnitus can occur in one or both ears and can be continuous or intermittent. Individuals with tinnitus report varying sounds (e.g., buzzing, ringing, hissing, sizzling) and such sounds can vary in intensity, loudness, and pitch, making habituation difficult. Tinnitus is a virtually incurable condition and, for most, no organic cause can be found. Additionally, there are no generally successful treatments available for individuals experiencing this condition.

Past research has revealed that how objectively severe (i.e. how loud) one's tinnitus is does not accurately predict how an individual reacts psychologically to the tinnitus (Meikle & Taylor-Walsh, 1984). In fact, many have found that the subjective distress of tinnitus only weakly correlates with measures of objective severity (i.e. psychoacoustic matching of sound intensity) (Holgers, Erlandsson & Barrenas, 2000). Most of those who experience tinnitus do not seek medical help for their condition (Budd & Pugh, 1996; Greimel et al, 1999; Kirsch, Blanchard & Paines, 1989). However, 6% of the tinnitus population (Kirch et al., 1989) experience tinnitus as very debilitating, distressing and interfering with many areas of their lives. This group tends to seek medical attention for their tinnitus and makes up an estimated 1-2% of the general population (Kirsch et al, 1989). For many of these individuals, tinnitus interferes in their work, family and social lives and other aspects of their everyday life (Refaie et al., 1999; Wilson et al., 1991). These individuals tend to have chronic tinnitus and elevated levels of psychological

disturbance such as anxiety and depression, and often experience concentration and sleep difficulties (Halford & Andersson, 1991; Hiller, Goebel & Rief, 1994).

Rheumatoid arthritis (RA)

The second illness, rheumatoid arthritis, is the most common chronic inflammatory arthritis and it is estimated that around the world, 1 in every 100 people suffer from rheumatoid arthritis (Hartzheim & Goss, 1998). In Western countries, it affects 1-3% of the population with a 3:1 ratio of females to males who experience this condition (Cotran et al, 1995; Abdel-Nasser et al, 1997; Hartzheim & Goss, 1998). RA is a progressive autoimmune disease that encompasses joint pain, swelling and redness. It can also lead to deformity and significant disability that can severely limit an individual's ability to perform everyday tasks. There is no known cure for RA, though treatments are available (i.e. medicine) that may or may not bring relief. Like tinnitus, individuals with RA report higher levels of depression and anxiety than the general population (Takeda et al., 2000). Similar to tinnitus, the severity of RA (i.e. pain level, disability) does not predict how one reacts subjectively to it (Groarke et al., 2004; Smith & Wallston, 1996; Wolfe, 1999), suggesting that other factors contribute to how individuals with tinnitus or RA adjust to their condition.

Negative Life Changes, Positive Life Changes and Adjustment

In the past few decades there has been a growing interest in the study of life changes that people frequently experience following adversities (i.e. chronic illness, bereavement, natural disasters, and sexual assault). Research in this area initially focused on the negative changes that are a result of adversity, such as emotional and/or psychological scars, including shattered assumptions about personal safety and control,

the benevolence of others, and the justness or fairness of society and the world (Janoff-Bulman, 1992). These challenges or violations result in revisions or complete rejections of the old assumptions in light of the new information that the life event or circumstances have brought forward. For example, Frazier, Conlon and Glaser (2001) found in a sample of sexual assault survivors that beliefs in the goodness of others and worldviews on fairness and safety were negatively affected by the assault even one year after the assault.

Negative life changes, such as a change in worldviews, can have important implications for adjustment to adversity and have been found to correlate significantly with measures of psychological distress. Lehman et al. (1993) found in their sample of bereaved individuals that negative life changes were positively associated with distress as measured by the SCL-90-R. In their sample of women who had experienced sexual assault, Frazier et al. (2001) found that negative life changes were strongly associated with depression at 2 weeks and 12 months after the assault. Similarly, Curbow et al. (1993) reported that negative life changes were strongly associated with negative mood in their sample of bone marrow transplant patients. Negative life changes were also associated with lower current and future life satisfaction.

Although challenges to an individual's assumptions about the world and oneself may result in a more pessimistic, cynical, or unsettling view of oneself, others, and the world and lowered perceptions of meaning in life, these challenges may result in more positive changes in how one sees oneself, others and the world. Some researchers (e.g. Collins, Taylor & Skokan, 1990; Taylor, 1983, 1989) suggest that such challenges to implicit assumptions do not have to be exclusively negative and can be viewed as challenges that can enhance personal efficacy and self-esteem and can lead to positive

reassessments of goals and life priorities and growth. Indeed, positive life changes have been reported by individuals in a variety of traumatic events (e.g. bereavement, Lehman et al., 1993; sexual assault, Frazier, et al., 2001; HIV infection, Updegraff, Taylor, Kemeny & Wyatt, 2003; and cancer, Klauer, Ferring & Filipp, 1998). For example, between 50% (Taylor, Lichtman & Wood, 1984) and 90% (Collins et al., 1990) of cancer patients in two different studies reported some degree of positive life change as a result of their illness. Similar frequencies have been found in other studies of individuals experiencing adversity (e.g. bone marrow transplantation, Curbow et al., 1992; bereavement, Lehman et al., 1993; and HIV and AIDS, Taylor, Kemeny, Reed & Aspinwall, 1991).

Despite the prevalence of reported positive life changes in the literature, the role that such changes play in distress and well-being is inconclusive.¹ There are problems in ascertaining whether positive life changes relate to adjustment. First, most studies of positive life changes have not taken into account negative life changes, despite the fact that theory suggests that positive life changes emerge out of shattered worldviews (Janoff-Bulman, 1992; Wortman, 2004). There are only a handful of studies that have examined both positive and negative life changes in relation to measures of adjustment (i.e. depression, well-being; e.g., Curbow et al., 1993; Frazier et al., 2001; Klauer et al., 1998; Lehman et al., 1993; and Taylor et al., 1991). A number of studies have found that negative life changes are more strongly associated with adjustment than are positive life changes (Curbow et al., 1993; Frazier et al., 2001; Lehman et al., 1993). If this indeed is the case then it is essential that researchers study both positive and negative changes

¹. Although positive life changes are thought by some (i.e. Tedeschi & Calhoun, 2004) to be outcomes of certain processes (i.e. cognitive processing, challenges to schemas etc.), they are not the same conceptually as outcome measures such as depression and positive emotionality. Positive life changes are attitudinal and cognitive changes in how a person views the world, others and themselves, whereas depression and positive affect relate to an individual's mood.

because the latter may have a greater effect on adjustment than do positive life changes. In fact, researchers have suggested that perceiving positive life changes, while at the same time acknowledging negative life changes, may be what is needed to predict better adjustment following trauma (Lehman et al., 1993; Taylor, Kemeny, Reed & Aspinwall, 1991) and will allow for a more complete understanding of the effects of trauma (Calhoun & Tedeschi, 1998; McMillen, 1999).

The second problem in ascertaining whether positive life changes relate to adjustment is that the few studies that do report both positive and negative life changes have produced inconclusive results with respect to positive life changes. Taylor et al. (1991) found, in a sample of HIV + men, that positive life changes were associated with adjustment only when negative life changes were reported as well. Frazier et al. (2001), in their sample of women who had experienced sexual assault, reported that positive life changes were related to less psychological distress (i.e., measures of depression and symptoms of PTSD). However, negative life changes were more strongly related to distress than were positive life changes. In a sample of bereaved spouses and parents, Lehman et al. (1993) found that, despite individuals reporting more positive life changes than negative life changes, negative life changes were more highly related to distress than were positive life changes, which were completely unrelated to measures of distress and well-being. Reporting more positive life changes also did not lead to higher levels of well-being or less distress than those who had reported fewer positive life changes. Curbow et al (1993) also found no relation between positive life changes and distress (i.e., depression) in individuals who had undergone bone marrow transplantation.

Rather than having direct effects on psychological distress, positive life changes may serve to moderate the effects of negative life changes on adjustment. Taylor (1983) suggests that individuals who are coping with highly negative situations find meaning in their adversity by perceiving positive aspects of their adversity. This “cognitive adaptation” can minimize the negative impact of the stressful or traumatic event. Some research has supported the idea that positive life changes can moderate the effects of negative life changes. In Curbow et al.’s (1993) study of bone marrow transplantation survivors, though positive life changes were unrelated to life satisfaction, they moderated the relationship between negative life changes and life satisfaction.

Time since the onset of an adversity (i.e. onset of illness) may also play a role in the relationship between positive life changes and adjustment. Some claim that positive life change is a result of a long recovery process (i.e. Schaefer & Moos, 1998; Calhoun & Tedeschi, 1998). According to some research, the experience of positive life changes in one’s life can occur at any time. For example, some have reported individuals having experienced positive life changes in as little as two weeks after the onset of an adversity (i.e. sexual assault, Frazier et al. 2001). This raises questions as to how positive life changes experienced earlier in the recovery process relate to adjustment versus positive life changes experienced after many years. If positive life changes are found to buffer the ill effects of negative life changes on adjustment, is this relationship as strong after many years of coping with an adversity and would positive life changes hold the same value? In Frazier et al. (2001), positive and negative life changes were measured at two points in time in women who had experienced sexual assault: two weeks and 12 months post-assault. They found that at two weeks positive life changes were moderately to strongly

related to depression ($r = -.50, p < .001$) and PTSD symptoms ($r = -.38, p < .001$). At 12 months the strength of the relationships decreased to $r = -.35, p < .001$, for depression and was completely unrelated to PTSD symptoms. These results suggest that more study is needed as to whether positive life changes relate to adjustment according to the time since onset of adversity.

The Veracity of Reported Positive Life Changes

As summarized previously, the mixed results in the literature suggest that further study is needed as to what role positive life changes serve in the adversity-adjustment relationship. The inconclusive results have caused some to question whether self-reported positive life changes represent real life changes. Some have suggested that self-reported positive life changes may partly reflect cognitive illusions or self-deception (McFarland & Alvaro, 2000). McFarland and Alvaro (2000) suggest that such cognitive illusions serve to maintain self-esteem in threatening situations. Taylor (1983) has suggested that an individual's success in coping with a threat or adversity resides in the maintenance of illusions of a positive nature about the adverse event or its effects. Taylor and colleagues (Taylor, 1983; Taylor & Armor, 1996; Taylor et al., 2000) have found in a variety of studies that when individuals are faced with a threat, they tend to respond with somewhat distorted positive perceptions of themselves (as compared to others going through the same circumstances), feelings of personal control and unrealistic feelings of optimism. Others have suggested that self-reported positive life changes may be self-representational and may be the result of an individual's attempt to paint a more positive picture of their life than what is really so (Wortman, 2004). Researchers have noted that when a person is faced with highly stressful circumstances, a common tendency is to cope by identifying

positive aspects of the circumstance or by positive reinterpretation of the circumstances in an effort to relieve distress (Carver, Scheier, Weintraub, & Jagdish, 1989; Park, 2004).

Some researchers, however, argue that reported positive life changes “go beyond” cognitive illusions or self-deception and an individual’s motivations for self-enhancement and represent real change in a person’s life (Tedeschi & Calhoun, 2004). Attempts have been made to investigate the veracity of reports of positive change through various methods. One method is to examine both the individual’s and an informant’s (i.e. family member, spouse) reports of positive life change in that individual. Two separate studies (Park et al., 1996; Weiss, 2002) found significant, moderate correlations between an individual’s self-report of positive change and the informant’s report of that individual’s change. Another method that researchers have used to investigate the validity of reports of positive life change is investigating changes to personality characteristics across time. For example, in a longitudinal study of college students who had reported on their most stressful event in the past six months, Park et al. (1996) found that reports of positive life changes were associated with increases in reports of optimism and positive affectivity.

Another way that researchers can attempt to tease apart the meanings behind reported positive life change is by measuring the extent to which an individual reports *both* positive and negative life changes (as noted previously, a limited number of studies have measured both). The motivation behind measuring both positive and negative changes is that their combination lends strength to the veracity of the reported positive life changes, as reporting negative life changes is expected to be associated with less self-deception and self-enhancement (Park, 2004). In effect, reporting negative life change illustrates a degree of honesty with oneself and others about the realities of the highly

stressful circumstances. Past research has attempted to investigate the relation between positive life changes and measures of social desirability (Park et al., 1996; Tedeschi & Calhoun, 1996) and positive response bias (Cordova, Cunningham, Carlson, & Andrykowski, 2001). Both Tedeschi & Calhoun (1996) and Park et al. (1996) found no relation between their measures of positive life change and the Marlowe-Crowne Social Desirability Scale. Additionally, Cordova, Cunningham, Carlson, and Andrykowski (2001) reported that positive response bias did not account for reported positive life change in their sample of women with breast cancer.

The Marlowe-Crowne Social Desirability Scale, (which is a unidimensional measure of socially desirable response style) has been used exclusively in past research pertaining to the relationship between reported positive life changes and social desirability. The unidimensional nature of the Marlowe-Crowne may be problematic as some have argued that desirable responding is actually composed of two different factors: self-deception and impression management (Paulhus, 1984). Self-deception is the measurement of defensiveness toward personal threats. In self-deception there is a positively biased mode of responding that the respondent believes to be true. Impression management, on the other hand, focuses on others and is characterized by situational variations in responding that are guided by a desire to create a favourable impression on others. A measure that captures the dual nature of social desirability is needed in studying the relationship between positive life changes and desirable responding.

Time since the onset of an adversity may also play a role in the veracity of positive life changes (i.e. Cohen, Hettler & Pane, 1998; Frazier et al., 2001, Tomich & Helgeson, 2003). Some posit that positive life change reported earlier in the coping process of an

adversity may actually represent self-deception or are attempts at self-enhancement (Cohen, Hettler & Pane, 1998; & Tomich & Helgeson, 2003). Others have found that earlier reports of positive life change are associated with better long-term recovery outcomes (Affleck, Tennen, Croog & Levine, 1987; Frazier et al., 2001; McMillen, Smith & Fisher, 1997). For example, Frazier et al. (2001) found that earlier experiences of positive life change (i.e. 2 weeks post-sexual assault) predicted less distress 1 year later. More study is needed as to whether time since adversity onset relates to the veracity of reported positive life changes.

The Present Study

The goals of the present study are: 1) to investigate whether positive and negative life changes relate to adjustment to illness and whether positive life changes moderate the relationship between negative life changes and adjustment; 2) to examine the veracity of reported positive life changes; 3) to investigate whether there is a time since illness onset component to the veracity of positive life changes and their relationship to adjustment.

The following are specific predictions in relation to the above goals:

Hypothesis 1: Positive life changes will buffer the ill effects of negative life changes on adjustment (depression, positive emotionality). This relationship may also be qualified by time since illness onset.

Hypothesis 2 a): Because negative life changes are thought to represent a degree of honesty with oneself and others, it is expected that negative life changes will be negatively related to self-deception and impression management.

Hypothesis 2 b): It is expected that positive life changes will be modestly, positively related to self-deception and impression management. A modest correlation is predicted because positive life changes may only partly reflect social desirability.

Hypothesis 2 c): Those reporting high positive life change in the presence of low negative life change may have higher self-deception and impression management than those reporting high positive life change in the presence of high negative life change. Additionally, this relationship may be qualified by time since illness onset.

Hypothesis 3: It was previously mentioned that positive life changes may act indirectly on adjustment through its buffering effect on the relationship between negative life changes and adjustment (e.g. Curbow et al., 1993). The inconclusive results in the literature as to whether positive life changes relate to adjustment also suggest that positive life changes may relate directly to adjustment as well (i.e. Frazier et al., 2001). Whether positive life changes relate directly to adjustment may depend on the nature of social desirability factors. Past research has suggested that positive illusions are more common in mentally healthy individuals than in those who are depressed and some have argued that these positive illusions are actually adaptive (Taylor & Brown, 1988). Self-deception may actually be beneficial in regards to adjustment to adversity. Impression management on the other hand has not been found to be beneficial to adjustment. In fact, past research has found that self-deception is associated with positive adjustment outcomes (i.e. positive affect), though impression management is not (Brown, 1998; Paulhus & Reid, 1991). In impression management, an individual is not being honest with others about themselves and are not actually experiencing what they report. However, an

individual engaging in self-deception actually believes what they report. Whether a person with tinnitus or RA is *actually* experiencing positive life change or whether they *believe* they are experiencing positive life change may not matter with respect to adjustment. Due to the inconsistencies in the literature in regards to the relationship between positive life changes and adjustment and lack of research as to whether social desirability factors moderate this relationship, any predictions pertaining to these relationships will be exploratory. It is expected that self-deception will moderate the relationship between positive life changes and adjustment, though impression management will not.

Methods

Procedure: Participants were recruited through online tinnitus and RA support message boards, and through the Tinnitus Association of Canada contact list of support groups in Canada. Participants aged 18 years and older were asked to fill out an online survey using Survey Console online survey software. Once the participants had completed their survey, the surveys were submitted and stored online using this software.

Sample Characteristics:

Tinnitus. The tinnitus sample ($n = 184$) was composed of 69% males, 29.3% females and 3 individuals who did not report gender information. This is consistent with literature in that there is a higher incidence of tinnitus in males than females (Sanchez, 2004). The mean age of participants in this sample was 46 ($SD = 13.32$), ranging from 18 to 77. Participants in this sample have had their tinnitus for an average of 8 years ($SD = 10.11$) with a range of 1 month to 55 years. The majority of this sample came from either the US, Canada or the UK (80.5%, $n = 148$) and 10.4% ($n = 19$) residing either in

Norway, Germany or Australia. The remainder reported residing in other countries (e.g. Fiji, China and Italy). Most participants were married (56%, $n = 103$) or single (29.3%, $n = 54$).

This sample was primarily Caucasian (90.2%, $n = 166$). Though tinnitus affects all ethnic groups, past research has found a higher prevalence of tinnitus amongst Caucasians than African Americans in the U.S. (Adams, et al., 1999). The primarily Caucasian sample may not be representative of all individuals with tinnitus.

The majority of participants were employed full-time (54.9%, $n = 101$) or were retired (20.1%, $n = 37$) or unemployed (11.4%, $n = 21$). The remainder reported being employed part-time (6.5%, $n = 12$), a student (4.9%, $n = 9$) or on leave (2.2%, $n = 4$). Highest level of education was fairly equally distributed across the sample with 13% ($n = 24$) with “high school”, 20.7% ($n = 38$) with “some college”, 28.3% ($n = 52$) a “college graduate” and 20.1 % ($n = 37$) with a “master’s degree”. The remainder (17.4%, $n = 32$) reported either “grammar school”, “vocational/technical school”, “doctoral degree”, “professional degree” or “other”. There appears to be a gap in the literature as to the distribution of employment status and level of education in the tinnitus population. It is therefore not known whether the present tinnitus sample is representative in this regard.

RA. The RA sample ($n = 215$) was primarily composed of female participants (90.2%, $n = 194$). This finding is consistent with past research in that there is a higher proportion of females than males who experience RA; however the ratio of females to males in the present study is higher than the 3:1 ratio found in previous studies (Cotran et al, 1995; Abdel-Nasser et al, 1997; Hartzheim & Goss, 1998). The mean age in this sample was 44 (SD = 10.75), ranging from 18 to 78 years old. Participants reported having had

their RA for an average of 6 years ($SD = 7.34$), ranging from 1 month to 44 years. The majority of this sample reside in the US (82.3%, $n = 177$) and 13.9% ($n = 30$) report living in either Canada, the UK or Australia with the remainder (3.5%, $n = 7$) living in other countries (e.g. India, Spain and Mexico). Most participants were married (68.4%, $n = 147$) or single (20.9%, $n = 45$).

As in the tinnitus sample, the RA sample is primarily Caucasian (90.2%, $n = 194$). RA is distributed worldwide and affects all ethnic groups (Klippel et al, (2001), therefore the predominately Caucasian sample may not be representative of all individuals with RA.

Participants reported being employed full-time (47.4%, $n = 102$), unemployed (17.7%, $n = 38$), employed part-time (15.8%, $n = 34$), retired (12.6%, $n = 27$), on leave (4.2%, $n = 9$), and a student (1.9%, $n = 4$). As in the tinnitus sample highest level of education was fairly evenly distributed with 18% ($n = 39$) with “high school”, 25.1% ($n = 54$) with “some college”, 33.5% ($n = 72$) a “college graduate” and 10.2 % ($n = 22$) with a “master’s degree”. The remainder (13.1%, $n = 28$) reported either “grammar school”, “vocational/technical school”, “doctoral degree”, “professional degree” or “other”. There also appears to be a gap in the literature as to the distribution of employment status and level of education in the RA population. It is therefore not known whether the present tinnitus sample is representative in this regard.

Measures:

Demographics. A series of questions related to demographic information were created for the purposes of the present study. The questions relate to country of residence, employment status, marital status, gender, race/ethnicity and time since onset of illness.

Positive and Negative Life Changes. Positive and negative life changes were measured using the Changes in Outlook Questionnaire (Joseph et al., 2005). The Changes of Outlook Questionnaire is a 26-item scale used to assess significant positive and negative life change as a result of adversity. One item was removed (*I feel as if I am dead from the neck downward*) due to conceptual inconsistencies with the other items. Within the questionnaire there are two scales, a positive change scale (11 items) and a negative change scale (14 items). An example of a negative item is “I have very little trust in myself now” and an example of a positive item is “I feel more experienced about life now”. Participants were asked to rate on a 6-point Likert scale the extent to which they agree with the statements. Item responses range from 1 (*strongly disagree*) to 6 (*strongly agree*). Joseph, Williams and Yule (1993) reported good internal consistency for the positive and negative life changes scales; .83 and .90 (respectively). Cronbach’s alpha for negative and positive life changes in the current study are .915 and .89 respectively.

Self-Deception and Impression Management. Self-Deception and Impression Management was measured using the 40-item Balanced Inventory of Desirable Responding (BIDR) (Paulhus, 1991). The BIDR is made up of two scales: Self-Deception and Impression management. The 20 –item Self-Deception Scale is designed to measure the extent to which an individual partakes in a positively biased mode of responding that the respondent believes to be true. Item examples include “*I don’t care to know what other people really think of me*” and “*I never regret my decisions*”. The Impression Management scale is also made up of 20 items and measures situational variations in responding that are guided by a desire to create a favourable impression on others. Item examples include “*I always obey laws, even if I’m unlikely to get caught*” and “*I have*

said something bad about a friend behind his or her back". All responses are on a 7-point Likert Scale ranging from *Not True* (1) to *Very True* (7). Only extreme scores (6 and 7 or 1 and 2 for reversed questions) are summed to create an overall score for each scale (Paulhus, 1991). Cronbach's alpha for the Self-Deception and Impression management scales are .79 and .85 respectively.

Adjustment

In the present study, attempts have been made to keep positive life changes and adjustment variables conceptually distinct, therefore measures of adjustment are limited to measures pertaining exclusively to mood (i.e. depression, positive emotionality).

Mood. Depression was measured using a shortened version (10 items) of the Center for Epidemiological Studies Depression (CESD) scale (Radloff, 1977) and has been used to measure depressive affect in many general population surveys. Participants were asked how frequently in the past two weeks they had felt or behaved in the listed way. Item examples include "You were bothered by things that don't usually bother you" and "You felt hopeful about the future" (Reversed). Response options were on a 4-point scale ranging from 0 (*less than 2 days*) to 4 (*9-14 days*). Cronbach's alpha for this scale is .88 in the present study.

Positive Emotionality. Positive emotionality was measured using the Positive Emotionality Measure (PEM) from Tellegen's Multidimensional Personality Questionnaire (Tellegen, 1982). The PEM is an 11-item scale designed to measure trait positive affectivity. High positive emotionality scorers are described as happy and enthusiastic, and as leading an interesting and exciting life. Cronbach's alpha was .90 for this scale.

Results

General Findings

Group Differences. An ANOVA was employed to examine differences among study variables between the tinnitus and RA samples. Group means and standard deviations can be found in Table 1a. Significant differences were found for positive life changes, $F(1, 397) = 49.792, p < .001$, negative life changes, $F(1, 397) = 3.903, p < .05$, impression management, $F(1, 379) = 7.338, p < .01$, positive emotionality, $F(1, 355) = 8.618, p < .01$ and time since illness onset, $F(1, 364) = 5.152, p < .05$.

Gender Differences. An ANOVA was also employed to examine gender differences in study variables. Group means and standard deviations can be found in Table 1b. Significant differences were found for positive life changes, $F(1, 394) = 23.641, p < .001$, impression management, $F(1, 376) = 20.089, p < .001$, and positive emotionality, $F(1, 353) = 7.65, p = .01$.

Table 1a

Differences Between Illness Groups

Variable	Tinnitus		RA	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Positive Life Changes	37.66	12.76	46.00	10.84
Negative Life Changes	38.60	16.57	35.43	15.45
Depression	21.42	7.80	22.48	7.85
Positive Emotionality	5.97	3.49	7.02	3.27
Self-Deception	5.86	3.34	5.94	3.39
Impression Management	6.99	4.00	8.12	4.10
Time Since Illness Onset	8.10	10.11	6.00	7.34

Table 1b

Gender Differences

Variable	Males		Females	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Positive Life Changes	38.36	12.77	44.50	11.76
Negative Life Changes	38.32	16.63	35.95	15.56
Depression	21.68	8.07	22.18	7.66
Positive Emotionality	5.89	3.43	6.92	3.34
Self-Deception	5.86	3.26	5.96	3.44
Impression Management	6.43	3.86	8.33	4.05
Time Since Illness Onset	7.47	9.84	6.77	8.22

Moderator Effects of Positive Life Changes in the Relationship between Negative Life Changes and Adjustment

The moderating effects of positive life changes on the relationship between negative life changes and both adjustment variables (depression and positive emotionality) were tested using hierarchical regression in two separate analyses. As the focus of the analysis was interaction effects, all main effect variables were entered simultaneously in the first step: negative life changes, positive life changes, time since illness onset, illness type, and gender.² The interaction of positive and negative life changes was entered in the second step and the interaction of positive life changes, negative life changes and time since illness onset was entered in the third step. Prior to computing the interaction terms, scores for negative and positive life changes and time since illness onset were centered by subtracting the participant's raw scores on these variables from the mean score (West, Aiken & Krull, 1996). The results of these analyses are presented in Table 2.

² Only significant interactions are reported. All 2-way, 3-way and 4-way interactions amongst the main effect variables were carried out in an exploratory fashion for all analyses conducted in the present study. No additional 2-way, 3-way and 4-way interactions were found.

Table 2

Hierarchical Regression of Positive and Negative Life Changes, Time Since Illness Onset, and their Interaction on Adjustment

Variable	<u>B</u>	<u>SE B</u>	β	R ²	R ² Change
Depression					
Step 1					
Negative Life Change	.318	.021	.643**		
Positive Life Change	-.007	.029	-.011		
Time Since Illness Onset	-.025	.037	-.029	.424	.424**
Illness Type	2.451	.824	.157**		
Gender	-.148	.811	-.009		
Step 2					
PositiveXNegative	.000	.002	.000	.424	.000
Step3					
PositiveXNegativeXTime	.000	.000	.046	.426	.002
Positive Emotionality					
Step 1					
Negative Life Change	-.111	.011	-.478**		
Positive Life Change	.075	.014	.267**		
Time Since Illness Onset	.022	.018	.004	.336	.336**
Illness Type	-.186	.409	-.027		
Gender	.410	.397	.059		
Step 2					
PositiveXNegative	.002	.001	.103*	.344	.008*
Step3					
PositiveXNegativeXTime	.000	.000	-.105*	.353	.008*

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

There were significant main effects for negative life changes and illness type for depression. Higher depression scores were associated with higher scores in negative life change and having RA. No significant interaction effects were found for depression.

When positive emotionality was the dependent variable, both the two-way and three-way interactions were significant. Positive life changes were found to moderate the

relationship between negative life changes and positive emotionality. Additionally, this two-way interaction was qualified by time since illness onset. To better understand this interaction, positive life changes ($M = 42.1554$, $SD = 12.46466$) were dichotomized into high and low by splitting this variable into +1 SD above the mean and -1 SD below the mean (West, Aiken & Krull, 1996). Further, time since illness onset ($M = 7.0423$, $SD = 8.87993$) was split into "Recent Onset" (less than 7 years with illness) and "Distant Onset" (greater than 7 years with illness) using a median split as the SD was higher than the mean. Figures 1a and 1b illustrate these findings.

As shown in Figures 1a and 1b, when illness onset was recent (i.e. less than median = 7 years), positive life changes interact with negative life changes. In Figure 1a positive life changes moderated the relationship between negative life changes, providing a buffering effect. This relationship was present only when negative life changes were high. When illness onset was distant (i.e. greater than 7 years since onset), positive and negative life changes do not interact, though there is a main effect of positive life change. In both Figures 1a and 1b, those with high positive life change report higher levels of positive emotionality than do those with low positive life change.

Positive and Negative Life Changes, Self-Deception and Impression Management

Bivariate Relations. Table 3 shows the bivariate relations between positive and negative life changes and self-deception and adjustment. Positive life changes were found to relate modestly with self-deception, $r(383) = .133$, $p < .05$, and impression management, $r(379) = .160$, $p < .05$. Negative life changes showed a moderate, negative relation to self-deception, $r(383) = -.255$, $p < .01$ and were found to be unrelated to impression management, $r(379) = -.008$.

Figure 1a

Figure 1b

Table 3
Intercorrelations of Positive and Negative Life changes with Adjustment Variables, Self-Deception, Impression Management and Time Since Illness Onset

Variable	1	2	3	4	5	6	7
1. Positive Life Changes	---	-.132*	-.098	.335**	.133*	.160*	.146*
2. Negative Life Changes		---	.642**	-.501**	-.255**	-.088	-.148*
3. Depression			---	-.384**	-.142*	-.026	-.150*
4. Positive Emotionality				---	.133	.098	.113*
5. Self-Deception					---	.430**	.074
6. Impression Management						---	.074
7. Time since illness onset							---

* $p < .01$

** $p < .001$

Moderator Effects of Negative Life Changes and Time Since Illness Onset in the Relationship Between Positive Life Changes and Self-Deception/Impression Management

The moderating effects of negative life changes and time since illness onset on the relationship between positive life changes and both self-deception and impression management were tested using hierarchical regression in two separate analyses. As in prior analyses, all main effect variables were entered simultaneously in the first step: positive life changes, negative life changes, time since illness onset, illness type, and gender. The interaction of positive and negative life changes was entered in the second step and the interaction of positive life changes and time since illness onset was entered in the third step. The interaction of positive life changes, negative life changes and time since illness onset was entered in the fourth step. As in previous analysis, prior to computing all interaction terms, scores for negative and positive life changes and time since illness onset were centered by subtracting the participant's raw scores on these variables from the mean score. The results of these analyses are presented in Table 4.

Table 4

Hierarchical Regression of Positive and Negative Life Changes, Time Since Illness Onset, and their Interaction on Self-Deception and Impression Management

Variable	<u>B</u>	<u>SE B</u>	β	R ²	R ² Change
Self-Deception					
Step 1					
Positive Life Change	.038	.015	.138*		
Negative Life Change	-.050	.011	-.237**		
Time Since Illness Onset	.002	.020	.006	.085	.085**
Illness Type	-.431	.447	-.065		
Gender	.104	.440	.015		
Step 2					
PositiveXNegative	-.001	.001	-.043	.087	.002
Step3					
PositiveXTime	.004	.002	.143	.104	.017*
Step 4					
PositiveXNegativeXTime	.000	.000	.076	.106	.002
Impression Management					
Step 1					
Positive Life Change	.023	.019	.069		
Negative Life Change	-.019	.014	-.075		
Time Since Illness Onset	.022	.025	.050	.057	.057**
Illness Type	-.469	.550	-.059		
Gender	1.766	.540	.216**		
Step 2					
PositiveXNegative	-.003	.001	-.157	.078	.021**
Step3					
PositiveXTime	.002	.002	.064	.081	.003
Step 4					
PositiveXNegativeXTime	.000	.000	.013	.081	.000

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

When self-deception was the dependent variable, no interaction was found for PositiveXNegative or PositiveXNegativeXTime; however a significant PositiveXTime interaction was found. To better illustrate this interaction, time since illness onset ($M = 7.0423$, $SD = 8.87993$) was dichotomized into "Recent Onset" and "Distant Onset" using

a median split. This interaction has been graphed in Figure 2. As Figure 2 illustrates, when illness onset was distant (i.e. greater than 7 years) since onset of illness, positive life change scores increase as self-deception scores increase. However, when illness onset was recent, self-deception scores were unrelated to positive life changes.

Figure 2

Gender was the only significant main effect for impression management.

Impression management was associated with being female. There was a significant

PositiveXNegative interaction for impression management. PositiveXTime and

PositiveXNegativeXTime interactions were not significant. To examine the

PositiveXNegative interaction, negative life changes were dichotomized into high and

low by splitting this variable into +1 SD above the mean and -1 SD below the mean in the

manner conducted in previous analyses. Figure 3 illustrates this interaction. As shown,

impression management is positively related to positive life changes when negative life

changes are low. When negative life changes are high impression management scores

change very little as positive life change scores increase.

Figure 3

Moderator Effects of Self-Deception Versus Impression Management in the Relationship Between Positive Life Changes and Adjustment

Four separate hierarchical regressions were performed to investigate the moderator effects of self-deception versus impression management in the relationship between positive life changes and each of the two adjustment variables. In the first two regressions the dependent variables are depression and positive emotionality. In both regressions, all main effect variables were entered simultaneously in the first step: positive life changes, self-deception, time since illness onset, illness type, and gender. In the second step the interaction of positive life changes and self-deception was entered. In the third step a PositiveXTime interaction was entered and the interaction of PositiveXSelf-DeceptionXTime was entered in the fourth step. All variables were centered prior to computing interaction variables.

No interaction effects were found in any of the four regressions performed.

The beta values for the main effects found in the four regressions were similar to the Pearson r values found in Table 3 (see Appendix for these Beta values). To view these relationships please refer to Table 3.

Discussion

This study is one of a small minority of studies that look at both positive and negative life changes as a result of adversity and will add to the literature of adjustment to adversity and adjustment to chronic illness in particular. The first purpose of the present study was to examine whether positive and negative life changes relate to adjustment to chronic illness and to investigate whether positive life changes moderate the relationship between negative life changes and adjustment. The second purpose was to examine the veracity of reported positive life changes. Discussion will first focus on findings related to positive and negative life changes and adjustment. Secondly, findings pertaining to the veracity of reported positive life changes will be discussed. Lastly, limitations of the present study and future directions will be discussed.

Negative Life Changes, Positive Life Changes, Time Since Illness Onset and Adjustment

Analyses were conducted to investigate whether positive life changes moderate the relationship between negative life changes and the two adjustment variables, depression and positive emotionality. Investigations were also performed to examine whether this relationship was qualified by time since illness onset. It was found that positive life changes moderate this relationship for positive emotionality, though not for depression. When time since illness onset was recent, positive life changes seemed to buffer the ill effects of negative life changes on positive emotionality, but only when negative life changes were high. When negative life changes were few, positive life

changes did not buffer the relationship between negative life changes and positive emotionality. These results are similar to those of Curbow et al. (1993). In the current study, positive life changes moderated the relationship between negative life changes and positive emotionality only when time since illness onset was recent (i.e. 7 years or less). Though high positive life changes are associated with higher positive emotionality scores at both recent and distant onset (when negative life changes are high), positive life change acts as a buffer only within the first seven years of coping with an illness as Figures 1a and 1b illustrate. As Table 3 illustrates, negative life changes are negatively associated with time since illness onset and positive life changes are positively associated with time since illness onset. If negative life changes are indeed decreasing and positive life changes are increasing as time moves on, perhaps negative life changes are not as much of an issue when one has been coping with an illness for many, many years. Perhaps one has learned to deal with any negative life changes one has experienced and the strength and value of these negative life changes have decreased.

It is interesting to note that negative life changes were more strongly associated with both depression ($r = .642$) and positive emotionality ($r = -.501$) than were positive life changes ($r = .355$ for positive emotionality). In fact, positive life changes were completely unrelated to depression ($r = -.098$). This result is consistent with past studies (i.e. Curbow et al., 1993; Frazier et al., 2001; Lehman et al., 1993). Why would negative life changes be more strongly associated with adjustment than are positive life changes? The answer may be in the idea that bad events, emotions etc. have a more powerful effect on psychological health than do positive events, emotions etc. (see Baumeister, Bratslavsky, Finkenauer & Vohs, 2001 for a review). Brickman & Campbell (1971)

postulated a hypothesis called the “hedonic treadmill” whereby long-term happiness will remain stable and constant because the effects of good and bad events will wear off with time. In an effort to test their hypothesis, they interviewed individuals from three different groups: individuals who had won the lottery, individuals who had been paralyzed in an accident and individuals who had not recently gone through any major life event. They found, however, that bad events wore off more slowly than did good events. In another study, a sample of pregnant women were tested in a prospective design about the effects of stress in pregnancy (Wells, Hobfoll & Lavin, 1999). They measured gains and losses of resources in early pregnancy and also adjustment outcomes such as depression and anger. They found that losses predicted later anger even after controlling for initial anger levels. There were no significant effects for gains. In a longitudinal study, Nezlek & Gable (1999) measured the effects of daily events, both bad and good. Participants recorded their daily events and multiple measures of adjustments each day. They found that bad events had a stronger effect on adjustment on a daily basis, regardless of type of adjustment variable measured (i.e. depression, anxiety). It would appear that bad events, emotions and changes have a stronger impact on adjustment than do positive ones. The fact that positive life changes could buffer the effects of negative life changes on positive emotionality in the present study is an important one. Despite negative life changes having more “power”, positive life changes do hold value for an individual’s adjustment to adversity, especially within the first several years of coping with an illness..

Although positive life changes moderated the relationship between negative life changes and positive emotionality, this result was not found when depression was the

dependent variable. One possible explanation is that clinical depression was not screened out in the present study. As mentioned previously, depression is a very large problem in individuals with tinnitus and RA. If one has clinical depression, one would not expect that positive life changes would make a large difference in depression, as significant treatment is needed. Additionally, those with depression might not even focus on any possible positive changes as past research has indicated that highly depressed individuals have a propensity toward focusing on negative stimuli and emotions rather than positive ones (Baumeister et al., 2001).

The Veracity of Positive Life Changes

Analyses were performed to investigate the veracity of reported positive life changes. It was found that negative life changes were moderately, negatively associated with self-deception but unrelated to impression management. This lends strength to the idea that negative life changes indicate a degree of self-honesty about the ill effects of adversity. Curiously, when analyses were conducted to investigate whether negative life changes moderate the relationship between positive life changes and self-deception/impression management, results emerged significant for impression management but not for self-deception. In other words, when negative life changes were high, there was no relationship between positive life changes and impression management. However, when negative life changes were low, more positive life changes were associated with more impression management. These findings illustrate an important finding in regards to the veracity of reported positive life changes. If an individual is reporting a high amount of positive life change, yet is reporting little to no negative life change, it appears that this individual is not being truthful in regards to these

reported positive life changes. However when one is reporting a high degree of positive life change in the presence of a moderate to high degree of negative life change, it appears that this individual is being truthful about the positive life change they are experiencing. Thus negative life changes may act as a safeguard against efforts at impression management in regards to reporting positive life changes.

As expected, it was found that positive life changes showed a modest, positive relationship to self-deception and impression management. This is contrary to past findings that found that positive life changes were unrelated to social desirability as measure by Marlowe-Crowne (Park et al., 2006; Tedeschi & Calhoun, 1996). Using a more robust measure of social desirability such as the BIDR perhaps revealed this modest relationship. These results support McFarland and Alvaro (2000) that positive life changes may partly reflect cognitive illusions and/or self-presentation. These results also suggest that though there is a small amount of illusion or self-presentation when individuals report positive life change, the positive life changes that people report are not entirely contaminated by impression management and self-deception.

Analysis also revealed a significant timeXpositive interaction for self-deception. In recent onset (less than 7 years), self-deception did not change as positive life changes increased. However, when onset was more distant (more than 7 years), positive life changes increased as self-deception increased. When onset was distant (greater than 7 years) and positive life change was low, self-deception was at its lowest. Self-deception was at its highest for those with a distant illness onset and high positive life change. This result is quite interesting. Within the first seven years of coping with an illness, the positive life changes that people report have little to do with self-deception; however the

positive life changes that people report after many years of coping (greater than 7 years) are positively associated with self-deception when one reports a high amount of positive life change. This result runs contrary to the idea that positive life changes earlier in the coping process represent denial and that positive life change is only genuine after many years (Cohen, Hettler & Pane, 1998; & Tomich & Helgeson, 2003) and that positive life changes are only reported after a very long time (i.e. Schaefer & Moos, 1998; Calhoun & Tedeschi, 1998). In fact, these results suggest that positive life changes reported when onset of illness is more recent may be more veridical than those reported after many, many years. However, as mentioned previously, the veracity of reported positive life changes depends on the degree of negative life change that one also reports. This timeXpositive life change interaction on self-deception may be due to the prominence of negative life changes closer to the onset of an adversity when one is first experiencing changes such as shattered assumptions about the world, others and oneself. As results suggest, negative life changes decrease with time and perhaps these negative life changes are far from one's mind and they are now focused on positive life changes. Perhaps individuals are more prone to cognitive illusion after many years of coping with an illness, after the negative effects of the illness start to wane. In fact research suggests that individuals make temporal comparisons of how they are doing presently to how they were doing previously and will view their past in a more negative tone and their present in a more positive tone (McFarland et al., 1992). This temporal comparison can promote the perception, and perhaps exaggeration, of positive life change (McFarland & Alvaro, 2000). Individuals also have an expectation of positive life change as time goes on. As Heckhausen & Krueger (1993) found in a mixed-age sample, when individuals are asked

to rate the degree to which they expected their own personal qualities to change across the lifespan, they found that individuals expect to undergo increases in positive life change across their life rather than decreases.

Positive Life Changes, Social Desirability and Adjustment

Exploratory analysis was performed to investigate whether self-deception versus impression management moderate the relationship between positive life changes and adjustment. Analysis revealed that there were no interaction effects for either self-deception or impression management on either adjustment variable. There were, however, some interesting main effects. There was a significant main effect of time for both depression and positive emotionality, in that as time since illness onset increased, depression scores decreased and positive emotionality increased. Individuals seem to be adjusting better as time since illness increases. Additionally there was a significant main effect of self-deception on positive emotionality. In other words, self-deception was a significant predictor of positive emotionality. As self-deception scores increased, so too did positive emotionality. This result supports the notion that a certain degree of self-deception or positive illusion is actually beneficial for psychological health (Taylor & Brown, 1988).

Limitations and Future Directions

Due to the cross-sectional nature of this study, the causal direction of any relationships between study variables cannot be established. A longitudinal design is needed to examine both the causal direction of the relationships found and whether these relationships hold longitudinally in the same individuals. As there are only a handful of longitudinal studies that examine positive and negative life changes as a result of

adversity (i.e. Frazier et al., 2001; Lehman et al., 1993), more longitudinal studies are needed in general for the study of positive and negative life changes in adversity. Longitudinal design would also help to establish the process of realizing positive life change in one's life and what factors are conducive to reporting positive life change.

The Internet-based design in this study did not allow for the gathering of behavioural data in relation to positive and negative life changes. For example, we were not able to validate these changes through interviews with family members or friends. On the other hand, we were able to obtain a very large sample through this method that would have otherwise not have been possible through community-based sampling. Indeed the sample spanned four different continents. The size of this study's sample is one of its strengths and allows the detection of interaction effects. Krantz & Dalal (2000) have shown that not only are Internet-based samples larger, but they also may be more heterogeneous than community-based samples. Additionally, the findings in the present study suggest that these results are not illness specific as there were no illness type differences in regards to the buffering effects of positive life change on the relationship between negative life change and adjustment. This suggests that these results may be found in other illnesses and adversities, though these results need to be replicated in other samples.

As both samples were made up of primarily of Caucasian individuals and individuals from developed countries, the results from the present study are not representative of all individuals with tinnitus and RA. One possible explanation for this finding is that Caucasian households are more than twice as likely to own a computer and have Internet access than are Black or Hispanic households (Wilson, Wallin & Reiser,

2003). Future study is needed with different samples (i.e. different ethnic groups, individuals in developing countries) to establish whether the results in the present study generalize to people of other cultures/ethnicities.

Additionally, the Positive Emotionality Measure used in the present study has a trait-like quality to the questions and some may argue that this is measuring trait-like propensities toward experiencing positive emotions rather than situational adjustment. Due to the possible trait-like nature of positive emotionality, any differences in the present study found between the relationship of positive and negative life changes and positive emotionality versus depression should be interpreted with caution as depression (as measured by the CES-D) is a measure of state-like mood. If positive emotionality is indeed a trait, perhaps the tendency to report positive life changes may also be trait-like in quality, indicating that there are individual differences in the tendency to report positive life change. More study is needed in a longitudinal design to establish whether both the tendency toward positive emotionality and reporting positive life changes indeed differs across individuals.

As negative life changes seem to have a stronger relationship with adjustment, future study is needed as to the value and impact that people place on positive versus negative life changes in their lives. Perhaps there are individual differences in the impact of negative life changes that people experience. For example, perhaps individuals high in hardiness or optimism may not be as affected by negative life changes. As previously mentioned, it is imperative that researchers measure both positive and negative life changes to get a full understanding of the effects of adversity.

Testimonials from Participants

Adversities can have very real and powerful negative changes in a person's life.

In relation to his tinnitus, one participant stated the following:

You just have it, and that's life. It ruins a large part of the enjoyment of your life. The medications, and maskers only partly help, there is nothing I've been able to find that truly restores the feeling that life is enjoyable. Forget about a relationship, it ain't happening. I have no interest in it anymore.

Another participant described her experience with RA:

I have not told many people because I am afraid to have it get back to my employer. So I often feel as though I silently struggle alone. I have to just live in the moment and get through because I have no other option. Needing the money keeps me at work even when I hurt. The thing I hope comes out of this is to have an article that tells it like it is and not sugar coat it saying as long as you take your meds you will be fine, because if you don't have RA you truly have no clue of the pain and loneliness. You look fine to everyone else. They just assume you're lazy. Personally I have a high pain tolerance, but I feel worthless unless I push myself to get everything done that a healthy person would do.

However, positive life changes can be just as real and as this study shows, can have valuable benefits through their protective role in the relation between negative life changes and positive emotionality. As one participant with tinnitus stated:

Over the years, I have learned that even though some things have been "Taken AWAY" by this disease, other things have been given—it is up to me to find them

and take advantage of them. I have found that my faith has been of great help to me and other people in similar situations.

Another participant with RA said the following in relation to their illness:

Positive attitude! If you think about what you've lost, you'll be depressed. Things change due to RA but not all change is bad. Have something to look forward to & anticipate that isn't affected by RA. I don't think of myself as handicapped first because that isn't ALL that I am. Surround yourself with friends, family & interests that keep you appreciating life.

Clinical Implications

The results in the present study may have clinical applications for adjustment of individuals with chronic illness. If clinicians can encourage individuals to look for positive aspects of their adversity in therapy, while at the same time being aware of and acknowledging the negative aspects, many people coping with adversities such as chronic illness may have better adjustment than if they had not been encouraged to do so. As the results in the present study are preliminary, any possible clinical applications would have to be studied more rigorously in longitudinal, clinical samples.

Conclusion

Examining both positive and negative life changes in research is necessary for a more complete picture of adjustment to adversity. The findings in the present study suggest that positive life changes may be particularly useful when onset is recent (within the first 7 years) and when there is a high degree of negative life change. Additionally, the findings suggest that the veracity of positive life changes people report depend upon the degree to which they are also reporting negative life changes. Time since illness onset

appears to be an important factor in the relationship between positive and negative life changes and adjustment and social desirability. Additionally, measuring the extent to which individuals report both positive and negative life changes is essential in the study of life changes after adversity as the veracity of positive life changes depends upon the extent that an individual report negative life change as well.

Coping with an adversity such as tinnitus or RA can be extremely difficult and it is even more difficult to find positives where there seem to only be negatives. This study, however, has revealed that while negative life changes seem to be an inevitable part of dealing with an adversity, positive life changes are possible and may actually help to buffer the effects of these negative life changes.

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Appendix

Demographics

1. Age

What is your age_____

2. Gender

What is your gender____

Location

3. What country do you currently reside in? _____

4. Marital Status

What is your current marital status?

Single

Common law

Married

Widowed

Race/Ethnicity

5. Do you think of yourself as Native, First Nations, Inuit, or Metis?

Check One: ☐ Yes ☐ No ☐ Don't know

6. People sometimes identify themselves by race or the colour of their skin. How do you identify yourself?

Arab/West Asian (e.g. Armenian, Egyptian, Persian or Iranian, Lebanese, Moroccan)

Black (e.g. African, Haitian, Jamaican, Somali)

Chinese

Filipino

Japanese

Korean

Latin American (e.g. Spanish, Portuguese, Mexican, South American)

South Asian (e.g. East Indian, Pakistani, Punjabi, Sri Lankan)

South East Asian (e.g. Cambodian, Indonesian, Laotian, Vietnamese)

White (Caucasian)

Mixed

Other (please describe) _____

Don't know

Education

7. What is your highest level of education?

Grammar School

High School or equivalent

Vocational/Technical School

Some College

College Graduate

Master's Degree (MS, MA)

Doctoral Degree (PhD)

Professional Degree (MD,JD, etc.)

Other

Employment status

8. What is your current employment status?

Employed full-time

Employed part-time

Unemployed

On leave

Retired

Student

9. How long have you had tinnitus/RA?

Years _____

If under a year, how many months? _____

Changes in Outlook Questionnaire

Many people can experience changes as a result of an illness. The following are a list of changes that people may or may not experience as a result of their illness. Please indicate the degree to which you agree or disagree with following statements in regards to your tinnitus/RA.

Answer options: Strongly Disagree, Disagree Somewhat, Disagree Slightly, Agree Slightly, Agree Somewhat, Strongly Agree

1. I don't look forward to the future anymore.
2. My life has no meaning anymore.
3. I no longer feel I am able to cope with things.
4. I don't take life for granted anymore.*
5. I value my relationships much more now.*
6. I feel more experienced about life now.*
7. I don't worry about death at all anymore.*
8. I live every day to the full now.*
9. I fear death very much now.
10. I look upon each day as a bonus.*
11. I feel as if something bad is just waiting around the corner to happen
12. I'm a more understanding and tolerant person now.*
13. I have a greater faith in human nature now.*
14. I no longer take people or things for granted.*

15. I desperately wish I could I could turn the clock back to before it happened.
16. I sometimes think it's not worth being a good person
17. I have very little trust in other people now.
18. I feel very much as if I'm in limbo.
19. I have very little trust in myself now.
20. I feel harder toward other people.
21. I am less tolerant of others now.
22. I am much less able to communicate with other people now.
23. I value other people more now.*
24. I am more determined to succeed in life now.*
25. Nothing makes me happy anymore.

*positive change

CESD Depression Scale (Short Form)

Below is a list of some of the ways you may have felt or behaved. Please indicate how often you have felt this way during the **past two weeks**:

Response Options: Rarely or none of the time (less than 1 day), Some or all of the time (1-2 days), Occasionally or a moderate amount of the time (3-4 days), All of the time (5-7 days)

1. I was bothered by things that don't usually bother me.
2. I had trouble keeping my mind on what I was doing.
3. I felt depressed.
4. I felt every thing I did was an effort.
5. I felt hopeful about the future.
6. I felt fearful.
7. My sleep was restless.
8. I was happy.
9. I felt lonely.
10. I could not "get going"

PEM

On this page you will find a series of statements a person might use to describe her/his attitudes, opinions and other characteristics. Read the statement and decide which choice best describes you **most of the time**, and is **typically** true for you. Then indicate your answer to each statement by circling the (T) if that statement is typically true for you, or the (F) if you feel that the statement is not true for you most of the time.

1. It is easy for me to become enthusiastic about things I am doing.	T	F
2. I often feel happy and satisfied for no particular reason..	T	F
3. I live a very interesting life.	T	F
4. Every day I do some things that are fun.	T	F
5. I usually find ways to liven up my day.	T	F
6. Most days I have moments of real fun or joy.	T	F
7. I often feel sort of lucky for no special reason.	T	F
8. Every day interesting and exciting things happen to me.	T	F
9. In my spare time I usually find something interesting to do.	T	F
10. For me life is a great adventure.	T	F
11. I always seem to have something pleasant to look forward to.	T	F

Informed Consent

Carleton University Research Study Adjustment to Tinnitus/RA

Melinda S. Morgan, MA Candidate

Department of Psychology, Carleton University

You have been asked to be in a research study on how you cope with your tinnitus/RA and what changes have occurred in your life as a result of your tinnitus/RA. If you agree to participate in this study, you will be filling out some questionnaires about how you are adjusting to your tinnitus/RA and what life changes have occurred since your tinnitus/RA began. Only those **18 and over** are eligible to participate in this study.

The questionnaires should take approximately 30 minutes to complete, but there is no time limit, so you can take as long as you would like to complete them. You are free to stop filling out the questionnaires at any time, or to omit any questions that you feel uncomfortable answering. If you choose to stop the survey altogether, your recorded answers will be saved, however will not be used in any analyses.

Your answers will be kept anonymous and not shown to anyone except Melinda Morgan (primary researcher) and her Research Supervisor Dr. Mary Gick at Carleton University. You will not be asked to provide your name or any identifying information. You will be assigned a participant number on the survey and aggregate responses will be collected and used as a part of the primary researcher's Master's thesis, and may possibly be published at a future date.

After you complete the survey you will be automatically directed to debriefing information. There are no anticipated risks as a result of completing the questionnaires. However, this survey may provide an opportunity for self-reflection. If you would like to

discuss personal issues that result from thinking about these questions, please contact your local mental health services or your family physician, who can provide a referral for you. If you would like more information about tinnitus/RA please go to the Tinnitus Association of Canada's/Arthritis Society of Canada's website at <http://www.kadis.com/ta/tinnitus.htm> /<http://www.arthritis.ca>. You can also get in touch with Melinda if you have any questions or problems with completing the survey at mmorgan3@connect.carleton.ca.

Should you have any questions or concerns about this research study, please feel free to contact the principal investigator Melinda Morgan (mmorgan3@connect.carleton.ca), or her supervisor, Dr. Mary Gick (613-520-2600 x2648 or mary_gick@carleton.ca). If you have questions about the ethical treatment of participants you may contact Dr. Janet Mantler (613-520-2600 x4173 or janet_mantler@carleton.ca), Carleton University Ethics Committee for Psychological Research, or Dr. Tim Pychyl (613-520-2600 x1403 or tim_pychyl@carleton.ca), Graduate Studies Chair of the Department of Psychology, Carleton University.

Please click on the "I Agree" button if you would like to participate and you will be redirected to the survey. If you choose not to participate at this time, please click on the "No Thank-You" button below and you will be redirected to a different page.

I have read the above information and

I AGREE

I have read the above information and

NO THANK-YOU

Debriefing

Thank you very much for completing our online survey! Your participation is greatly appreciated and you will be contributing to the research literature on how people with tinnitus/RA cope with their illness. We look forward to learning from your responses.

What are we trying to learn in this research?

Many researchers are now studying how individuals can grow and change as a result of highly stressful life events or circumstances (i.e. tinnitus/RA). Many would agree that negative changes (negative changes to how one views themselves, others and the world) often result from experiencing chronic illness; however a growing body of research has emerged that suggests that positive life changes or growth can also occur as a result of adversity. Past studies have indicated that many people in a variety of highly stressful circumstances (i.e. chronic illness, bereavement, natural disasters) report positive life changes or growth emerging out of these circumstances. Some examples of such reported positive life changes include a reassessment of life priorities, greater appreciation of life and a deeper spirituality.

The present study is looking at the life changes that people coping with tinnitus/RA report and how these life changes (whether positive or negative) relate to how individuals adjust to their condition. We would like to examine whether certain personality characteristics and coping strategies make reporting positive life change more likely. There has never before been a study looking at positive and negative life changes in people with tinnitus/RA and therefore your participation in this study will contribute to new literature in the field of coping with tinnitus/RA.

Where can I learn more?

If you would like further information concerning this topic, here are a few applicable references:

Joseph, S., Williams, R., & Yule, W. (1993). Changes in outlook following disaster: The preliminary development of a measure to assess positive and negative responses.

Journal of Traumatic Stress, 6, 271-279.

Lehman, D., Davis, C., DeLongis, A., Wortman, C., Bluck, S., Mandel, D., & Ellard, J.

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Tedeschi, R. G., & Calhoun, L. G. (1995). *Trauma and Transformation: Growing in the Aftermath of Suffering*. Thousand Oaks, CA: Sage.

What if I have questions later?

If you have any complaints, concerns, or questions about the study that you have just completed, please feel free to contact **Melinda Morgan**

(mmorgan3@connect.carleton.ca), or her supervisor, **Dr. Mary Gick** (613-520-2600

x2648 or mary_gick@carleton.ca). If you have questions about the ethical treatment of participants you may contact **Dr. Janet Mantler** (613-520-2600 x4173 or

janet_mantler@carleton.ca), Carleton University Ethics Committee for Psychological

Research, or **Dr. Tim Pychyl** (613-520-2600 x1403 or tim_pychyl@carleton.ca),

Graduate Studies Chair of the Department of Psychology, Carleton University.

If you would like to discuss personal issues that result from thinking about the questions asked in this study, please contact your local mental health services or your family physician, who can provide a referral for you. If you would like more information

about tinnitus/RA please go to the Tinnitus Association of Canada's/Arthritis Society of Canada's website at <http://www.kadis.com/ta/tinnitus.htm> /<http://www.arthritis.ca>.

Beta Values for Hypothesis 3

Self-Deception. Significant main effects of self-deception ($\beta = -.117, t = -2.190, p < .05$) and time ($\beta = -.131, t = -2.412, p < .05$) were found for depression. Both self-deception and time since illness onset were negatively related to depression. No interaction effects were found. When positive emotionality was the dependent variable, significant main effects were found for positive life change ($\beta = .275, t = 4.898, p < .01$) and self-deception ($\beta = .193, t = 3.679, p < .01$).

Impression Management. A significant main effect of time since illness onset ($\beta = -.107, t = -1.886, p < .05$) was found for depression. When positive emotionality was the dependent variable, a significant main effect of positive life change ($\beta = .276, t = 4.755, p < .01$) was found.