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# Adjusting to Chronic Health Conditions

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## Abstract

Research on adjustment to chronic disease is critical in today's world, in which people are living longer lives, but lives are increasingly likely to be characterized by one or more chronic illnesses. Chronic illnesses may deteriorate, enter remission, or fluctuate, but their defining characteristic is that they persist. In this review, we first examine the effects of chronic disease on one's sense of self. Then we review categories of factors that influence how one adjusts to chronic illness, with particular emphasis on the impact of these factors on functional status and psychosocial adjustment. We begin with contextual factors, including demographic variables such as sex and race, as well as illness dimensions such as stigma and illness identity. We then examine a set of dispositional factors that influence chronic illness adjustment, organizing these into resilience and vulnerability factors. Resilience factors include cognitive adaptation indicators, personality variables, and benefit-finding. Vulnerability factors include a pessimistic attributional style, negative gender-related traits, and rumination. We then turn to social environmental variables, including both supportive and unsupportive interactions. Finally, we review chronic illness adjustment within the context of dyadic coping. We conclude by examining potential interactions among these classes of variables and outlining a set of directions for future research.

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## INTRODUCTION

In 1900, the average life expectancy in the United States was 47 years. By 2013, it was 79 years (Cent. Dis. Control Prev. 2013). Major reasons for this leap included better nutrition, better health care, and the development of vaccines. As the life span lengthened, people were no longer as likely to die from infectious diseases, such as tuberculosis, influenza, pneumonia, and diphtheria, but were more likely to acquire and die from chronic diseases, such as heart disease, cancer, emphysema, and cerebrovascular disease. However, today's leading causes of mortality are not always fatal; instead, people live for long periods of time with chronic disease. Today, about 85.6 million people in the United States are living with some form of cardiovascular disease or the aftereffects of stroke (Mozaffarian et al. 2015), 14.5 million people have a history of or are living with cancer (Am. Cancer Soc. 2016), and 29.1 million people have diabetes (Cent. Dis. Control Prev. 2014). People live for years if not decades with numerous other chronic diseases, including arthritis, HIV infection, osteoporosis, and multiple sclerosis. The defining feature of a chronic disease is that it persists, although conditions may deteriorate, advance, fluctuate, or be characterized by remissions. Chronic diseases are often managed by a variety of behaviors executed by the patient as opposed to the physician, such as taking medication, monitoring diet, exercising, and following up with health care professionals. These behaviors are expected to control or inhibit disease progression and to minimize disease side effects and disruptions to daily living. The prevalence of chronic disease and its impact on quality of life necessitate an understanding of how individuals adjust to chronic medical conditions.

In this review, we first examine the effects of chronic disease on one's sense of self. Then, we examine categories of factors that influence how one adjusts to chronic disease. These include

(a) contextual factors, such as demographic variables and dimensions of illness; (b) personality variables, which can be classified as resilience factors (e.g., self-esteem, mastery, optimism) or vulnerability factors (e.g., pessimistic attribution style, gender-related traits of unmitigated agency and unmitigated communion, rumination, avoidance); (c) social environmental variables, including social integration, social support, social conflict, and social control; and (d) dyadic coping. In describing the research that has linked each of these sets of factors to disease adjustment, we discuss various attempts to explicate these relations. Because these factors do not act in isolation, we also examine several interactionist frameworks that cut across categories in order to predict adjustment. Finally, we conclude by outlining a set of directions for future research in this area.

We note at the outset that several lines of investigation are not addressed in this review. We do not discuss research on chronic pain, nor do we focus specifically on terminal illness. This review focuses on work that has been conducted on adult populations rather than pediatric populations. Intervention research in this area is plentiful but beyond the scope of this review.

## EFFECTS OF CHRONIC DISEASE ON THE SELF

Adjustment to chronic disease can be understood by distinguishing between disease and illness: Disease refers to the undesirable biological processes that affect individuals, whereas illness refers to the person's experience of the disease, including its psychological and social effects (Charmaz & Rosenfeld 2010). In some sense, the American Psychological Association and other organizations have acknowledged this distinction by requiring the use of language that separates the illness from the self. That is, phrases such as cancer patients and terms such as diabetics have been replaced by phrases such as people with cancer and people with diabetes. We recognize that persons are not necessarily defined by disease.

The examination of how individuals adjust to chronic disease extends beyond the physical symptoms associated with the disease to include how the individual perceives, assesses, and adapts to these symptoms. The presence of a chronic illness alters an individual's sense of self, as the previously held healthy identity is replaced by an illness identity that includes physical impairments, emotional reactions to physical symptoms, and cognitive constructions of the illness (Charmaz & Rosenfeld 2010). A chronic illness heightens one's awareness of the body, challenges previously held beliefs about the self, influences relationships with others, and may alter an individual's plans for the future. Thus, an individual with a chronic illness must learn how the sense of self can accommodate the illness. Chronic illness also undermines the stability of the self by introducing a degree of uncertainty into life (Charmaz 1995, Charmaz & Rosenfeld 2010).

One aspect of the self that may be threatened by chronic disease is one's gender role or sexuality. For example, many cancers require surgical treatment that can threaten gender-related self-image. A study of men with prostate cancer showed that one-third reported feelings of diminished masculinity since treatment (Zaider et al. 2012). This sense of diminished masculinity was related to greater worries about sexual functioning, controlling for actual level of sexual functioning. Among women with breast cancer, those who were highly invested in their appearance reported greater distress prior to surgery and greater distress over the next year, and those who were highly invested in having their body intact showed more adjustment difficulties, including problems with attractiveness and sexual desirability (Carver et al. 1998). In a study that compared heterosexual women and lesbians with breast cancer, lesbians evidenced less sexual concern and less concern about appearance (Arena et al. 2007).

An individual can restore a sense of self by both altering the concept of the self and adjusting daily behaviors to accommodate physical impairments and symptoms (Charmaz 1995). However, this adjustment process does not happen at a single point in time; it is a continuous process that

is re-experienced every time a new physical impairment or deterioration occurs (Charmaz 1995). The extent to which an illness disrupts the sense of self and the severity of that disruption can change over time as individuals gain distance from the initial event and learn to integrate previously absent physical limitations into a new sense of identity (Charmaz 1995, Charmaz & Rosenfeld 2010). Thus, adjustment to chronic disease is affected by many factors, including the nature of the illness, the sex of the person experiencing the illness, personality variables, and characteristics of the social environment. We examine each of these factors in this article.

## **ADJUSTMENT TO CHRONIC DISEASE: CONTEXTUAL FACTORS**

A number of characteristics of both individuals and illnesses influence how one adjusts to chronic disease. In this section, we review some of the factors that have received the most research attention, specifically sex, social class, and race or ethnicity. A relatively unexplored area of research is sexual orientation and gender identity. With the exception of HIV and breast cancer, research on chronic illness among LGBT persons is sparse (Jowett & Peel 2009).

### **Sex**

Many studies have examined whether the sex of the person with a chronic disease is related to adjustment. For example, studies of people with type 2 diabetes have shown that women report poorer psychosocial adjustment, more depressive symptoms, and greater physical limitations compared to men (e.g., Iida et al. 2010). Similarly, studies of cancer (Baider et al. 1989) and heart disease (Hunt-Shanks et al. 2009) have shown that women adjust more poorly than men. There are exceptions, however, as one study showed that men with heart failure reported poorer health perceptions than women did (Macabasco-O'Connell et al. 2010).

There are many reasons for these sex differences. First, sex differences in disease adjustment are confounded by sex differences in morbidity among people without chronic disease. That is, in the general population, women perceive worse health, report more functional limitations, and have higher rates of depressive symptoms than men (for a review, see Helgeson 2012). Second, there are often sex differences in disease severity that could account for sex differences in disease adjustment. In the area of coronary heart disease, for example, women have more severe disease than men at diagnosis (Bucholz et al. 2014).

Among couples, the sex of the partner has implications for adjustment to chronic disease. A meta-analytic review of the literature on distress in couples coping with cancer showed that women were more distressed than men whether they were patients or partners of patients (Hagedoorn et al. 2008). Because women are more distressed than men in general, however, these studies cannot discern whether the distress is due to being female, being a spouse of a person with a chronic illness, or a combination of the two. One reason that female spouses could become particularly distressed is emotional contagion (Segrin et al. 2005). Patient distress may be more directly translated to spouse distress when spouses are female than when they are male.

### **Social Class**

A great deal of research has linked lower socioeconomic status (SES) or lower social class to poorer adjustment to chronic disease. For example, low-income individuals with coronary heart disease were more likely to experience a significant decline in their ability to perform the activities of daily life over 5 years compared to higher-income individuals (Sin et al. 2015). Individuals with

chronic obstructive pulmonary disease (COPD) at the lowest levels of income were at higher risk of hospital-based care, had more severe disease, and visited the emergency room more frequently compared to individuals at higher levels of income (Eisner et al. 2011).

There are several explanations as to why SES would be related to poor disease adjustment. The chronic stress inherent in the lives of low-SES individuals, including environmental hazards, noise pollution, and crime, may account for SES effects on health (Matthews & Gallo 2011). These same chronic stressors likely also impact psychosocial adjustment to chronic disease. Psychological distress has been identified as a potential link between SES and health, although findings from the literature supporting the mediating role of stress and distress have been mixed (Matthews & Gallo 2011). There is clearer evidence that the lack of positive psychosocial resources, such as perceived control and optimism, accounts for some of the relation between low SES and poor adjustment to chronic disease (Matthews & Gallo 2011).

## **Race and Ethnicity**

There is a large body of literature on racial and ethnic health disparities in the prevalence of and mortality from chronic disease (for reviews, see Mays et al. 2007, Mensah et al. 2005), but fewer studies examine how adaptation to chronic disease varies across races or ethnicities. Compared to White persons, Black persons report greater diabetes-related distress and greater interference from diabetes with daily life (Hausmann et al. 2010). Among those with heart failure, non-Whites report poorer health perceptions compared to Whites (Macabasco-O'Connell et al. 2010), and non-White persons with heart disease show a greater deterioration in functioning over 5 years compared to White persons (Sin et al. 2015).

Making these simple comparisons is easy, but it is more difficult to identify the reasons for these differences. Perceived severity may account for some of these differences, as, compared to White persons, Black persons are diagnosed with cancer at a later stage (Warner et al. 2012), have worse metabolic control of diabetes (Kirk et al. 2006), and have more severe heart disease (Cooper et al. 2000).

Adherence is another prominent explanatory variable. Compared to White persons, Black persons reported lower rates of medication adherence among patients with heart failure (Dickson et al. 2015) and hypertension (Kressin et al. 2007) and more missed appointments in a study of adults with diabetes (Schechtman et al. 2008). In a survey by a medical management organization of more than 6,000 people with diabetes, Black persons were less likely to use preventive services, were less likely to monitor their diet, and reported lower levels of exercise compared to White persons (Oster et al. 2006).

There may also be racial and ethnic differences in the way people respond to disease. In a sample of women with breast cancer, Hispanic women used less approach coping (acceptance, active coping, and positive reframing) and more avoidance coping (denial and behavioral disengagement) compared to non-Hispanic Whites (Umezawa et al. 2012). Black persons are more likely than White persons to turn to religion to cope with chronic disease (Harper et al. 2013). Black persons also have a general mistrust of the medical system that may impact their coping as well as adherence, as indicated by in-depth interviews with Black persons with diabetes (Peek et al. 2010). These interviews revealed that Black persons believe physicians are more likely to be domineering with them and less likely to share information with them, which leads to a general mistrust of physicians. Thus, Black persons are less inclined to share symptoms and health concerns with their physician. There is also evidence that Black persons have more negative beliefs about medication compared to Whites. In a survey of 806 persons with diabetes, adjusting for age, income, gender, and health literacy, Black persons were more likely than White persons to believe that prescription medication

can be addictive, that prescription medication can do more harm than good, and that it is good to stop using medication once in a while (Piette et al. 2010).

Social support does not clearly account for racial differences in disease adjustment. In studies of adults with diabetes, one showed that Black persons reported more diabetes-related social support than Whites (Hausmann et al. 2010), whereas another showed no differences in social support across Whites, Latinos, and Blacks (Rees et al. 2010). A nationally representative survey showed that non-Hispanic Whites reported more interactions with friends than Black persons but that Black persons reported more fictive kin (people not related by blood but treated like family) relationships and more interactions with family members than non-Hispanic Whites (Taylor et al. 2013). Thus, a clear support deficit does not exist among racial and ethnic minorities that accounts for poor adjustment outcomes.

One difficulty in examining the effects of race on disease outcomes is that race and ethnicity are often confounded with SES. There is some evidence that race differences in adjustment to chronic disease can be partly accounted for by SES and that SES is the more powerful predictor of adjustment. For example, in one study, the race effect on COPD outcomes disappeared after controlling for SES (Eisner et al. 2011).

## **Illness Dimensions**

Several dimensions of a chronic disease may be linked to adjustment. The Illness Perceptions Questionnaire was developed to identify these dimensions (Moss-Morris et al. 2002). A meta-analytic review of the literature using this instrument showed that three dimensions were strongly linked to nearly all indicators of illness adjustment (Hagger & Orbell 2003). Illness consequences (i.e., perceiving that the illness has major consequences for one's life) and illness identity (i.e., identifying that one has the illness itself, as well as the symptoms people associate with the illness) were associated with poor psychological and physical adjustment. By contrast, illness controllability (i.e., perceiving personal control over aspects of the illness) was associated with good psychological and physical adjustment. In a study of young adults with type 1 diabetes, perception of control over the illness was related to fewer treatment-related problems 5 years later, whereas perception of illness consequences was related to multiple indicators of poor diabetes adjustment (Rassart et al. 2015).

Stigma associated with a chronic illness also contributes to poorer adjustment (Charmaz & Rosenfeld 2010). Stigma has been linked to poor mental health (for a review, see Mak et al. 2007), and it interferes with treatment adherence (Bogart et al. 2015). Research on chronic illness among LGBT persons has identified discrimination by health care professionals and homophobia among potential support providers as barriers to effective treatment and impediments to adjustment (Jowett & Peel 2009). Perceived stigma is most strongly linked to poor outcomes, especially low self-esteem, when the stigma is perceived as legitimate and is internalized. When perceived stigma is internalized, it can be translated into feelings of shame and self-blame (Browne et al. 2013). Internalized homophobia has been linked to poor adjustment to breast cancer among lesbians (McGregor et al. 2001). However, if people reject the stigma, reactions range from anger to advocacy and empowerment to indifference. Certain dimensions of an illness influence the likelihood that the illness is stigmatized by others. For example, illnesses that are perceived as controllable and preventable, including lung cancer (Chapple et al. 2004), HIV/AIDS (Mahajan et al. 2008), and type 2 diabetes (Schabert et al. 2013), are associated with greater social stigma.

Disease adjustment is also influenced by the extent to which the illness is tied to one's self-concept. Illness centrality reflects the extent to which a person defines himself or herself in terms of the illness. Research on women with breast cancer found that illness centrality was related to poor psychological well-being, but this relation depended on illness valence (Helgeson 2011).

Illness centrality was related to poor psychological well-being only for individuals who viewed their illness in especially negative terms.

The impact of chronic disease on adjustment depends on whether the illness exists in isolation from other chronic diseases. People with chronic disease frequently face multiple chronic conditions (Parekh & Barton 2010), which makes adjustment more challenging as the individual has to adapt to the medical regimens required by each disease as well as any unique disease-specific psychosocial concerns. For example, in the Third National Health and Nutrition Examination Survey, 42.3% of individuals who were diagnosed with type 2 diabetes were also diagnosed with chronic kidney disease (Afkarian et al. 2013). Those with chronic kidney disease also have significantly more cardiovascular disease risk factors than those without chronic kidney disease, indicating the possibility of future comorbidity (Foster et al. 2013). These data indicate that it is highly likely that individuals with chronic disease are adjusting to multiple conditions.

In addition to comorbid physical disease, one of the most significant impediments to optimal adjustment to chronic disease is mental health status, particularly depression and anxiety. Depression is extremely common among those with chronic physical disease (Soo et al. 2009) and interferes with disease management (Hare et al. 2013). Thus, chronic illness adjustment is shaped by the presence of additional comorbid physical and mental health conditions.

## **ADJUSTMENT TO CHRONIC DISEASE: RESILIENCE AND VULNERABILITY FACTORS**

The risk and resistance framework (Wallander et al. 1989) can be used to understand what factors play a role in disease adjustment. This framework is an expansion of the stress and coping model and has been used to understand adaptation to chronic physical disorders (Wallander & Varni 1992, 1998). Chronic physical disorders are conceptualized as an ongoing strain. Risk factors impede adjustment, whereas resistance factors facilitate adjustment. Risk and resistance factors include both intrapersonal factors such as personality and interpersonal factors such as the social environment. We begin this section by examining resistance or resilience factors and then turn to risk or vulnerability factors. Rather than provide an exhaustive review of all the resilience and vulnerability factors that have been investigated, we highlight the ones for which large bodies of literature exist in the context of chronic illness.

### **Resilience Factors**

In the context of chronic illness, resilience is defined “as the ability to maintain normal levels of psychological well-being, or to return rapidly to prediagnosis levels” (Moskowitz 2010, p. 466). A number of studies have linked measures of resilience to good illness adjustment (for a review, see Moskowitz 2010). Rather than being a specific variable, resilience is often inferred from the relations between positive dispositional variables and good illness adjustment. In this section we discuss some of those positive frameworks.

**Cognitive adaptation theory.** One resilience framework that has been used to study disease adjustment is cognitive adaptation theory (Taylor 1983, Taylor & Brown 1988). According to cognitive adaptation theory, traumatic events, such as the onset of a chronic illness, threaten one’s assumptions about the self and the world, and successful adjustment requires the restoration of these assumptions. There is evidence that those who have faced trauma or chronic disease view the world somewhat differently than those who have not. In a study that compared victims of trauma to nonvictims, victims perceived themselves and the world more negatively than did nonvictims



(Janoff-Bulman 1989). In the area of chronic illness, a study that compared 5-year breast cancer survivors to an age-matched healthy control group showed that survivors perceived the world as less controllable and more random than did healthy controls but did not perceive any differences in personal control over their daily lives compared to controls (Tomich & Helgeson 2002).

Restoration of these positive beliefs about the self and the world seems to be associated with successful adaptation to chronic disease. Specifically, finding ways to enhance views of the self (e.g., by making downward comparisons), finding ways to reestablish one's sense of control, and maintaining an optimistic outlook through adversity have been linked to good psychological and physical adjustment to disease (for a review, see Taylor et al. 2000). Helgeson (2003a,b) utilized this theory to examine adjustment to heart disease and found that a cognitive adaptation index composed of self-esteem, mastery, and optimism predicted positive adjustment to disease and reduced likelihood of a recurrent event 4 years later. A longitudinal study of women with breast cancer identified distinct trajectories of mental and physical functioning over 4 years and showed that cognitive adaptation indicators (e.g., self-image, optimism, perceived control) distinguished trajectories in the predicted direction (Helgeson et al. 2004b).

Many studies focus on specific resilience factors rather than all three components of cognitive adaptation theory. A wealth of studies on perceived control show positive links to disease adjustment (Rassart et al. 2015) and better treatment adherence (Gonzalez et al. 2015). The related construct of self-efficacy, which is typically operationalized as feeling capable of controlling aspects of treatment regimen and disease outcomes, is related to better adherence and better health (Guertin et al. 2015) and explains the link between depressive symptoms and poor adherence (Tovar et al. 2015).

One of the potential limitations of cognitive adaptation theory with respect to chronic disease is that the health threat persists and individuals may face disease progression, setbacks, or recurrent events that further challenge beliefs about the self and world. Several studies have tested whether cognitive adaptation indicators continue to predict positive disease adjustment in the face of recurrent health threats. In a study of people who had been treated with angioplasty for heart disease, cognitive adaptation indicators continued to predict positive disease adjustment in the presence of a recurrent event—sometimes showing even stronger beneficial associations (Helgeson 1999). One possibility is that recurrent events imply a more severe health threat, and cognitive adaptation indicators are more potent in the face of more severe disease.

By contrast, a study that compared women with breast cancer who had and had not sustained a recurrence within 5 years of diagnosis showed that beliefs about control over illness at diagnosis were related to poorer physical and mental functioning for women who sustained a recurrence but were unrelated to outcomes for those who remained disease-free (Tomich & Helgeson 2006). Rather than argue that these findings refute an entire body of research on cognitive adaptation theory, the investigators argued that there might be boundary conditions on the theory and that the controllability of the illness is one such condition. In addition, whereas many of the previous studies examined a general sense of control or mastery, which may continue to be adaptive under severe circumstances, this study focused specifically on perceptions of control over the cancer. Other research on women with recurrent breast cancer found no links between control over the disease and adjustment (Carver et al. 2000).

A variety of pathways may connect cognitive adaptation indicators to positive disease adjustment. Positive health behavior is an obvious one. As described above, people characterized by control, optimism, and self-esteem are more likely to adhere to treatment recommendations and reduce risk behavior. A second possibility is social support. It may be easier for network members to provide support to those who have a positive outlook in regard to their disease and are



taking actions to promote their health. In fact, research has shown that depression drives network members away (Iida et al. 2010, Rassart et al. 2015).

**Personality.** One approach to the relation between resilience and disease adjustment focuses on the so-called big five personality traits: conscientiousness, neuroticism, openness to experience, extraversion, and agreeableness. However, not all of these traits can be conceptualized as resilience. Of the five, the strongest links to chronic illness adjustment have been found for conscientiousness (a resilience factor) and neuroticism (a vulnerability factor). Conscientiousness has predicted good adjustment in studies of adults with diabetes (Lawson et al. 2010, Rassart et al. 2014) and people with multiple sclerosis (Bruce et al. 2010), whereas neuroticism has been associated with poor adjustment in adults with type 1 diabetes (Lawson et al. 2010), poor health-related quality of life among persons with chronic kidney disease (Poppe et al. 2012), and poor adherence among adults with multiple sclerosis (Bruce et al. 2010). Coping has been implicated in the relation between these personality traits and disease adjustment. One study showed that those who were high in neuroticism and low in conscientiousness engaged in avoidant coping, which was then linked to poor adjustment (Rassart et al. 2014). Another study showed that the relation between neuroticism and poor health outcomes was explained by a lack of acceptance (Poppe et al. 2012).

Optimism has also received substantial attention with respect to adjustment to chronic disease. Optimism has been linked to better psychological and physical adjustment to coronary artery disease, cancer, and AIDS (for a review, see Rasmussen et al. 2006). In this case, as well, a primary explanation has been coping strategies. People who are optimistic are more likely to engage in positive coping strategies, such as positive reappraisal, acceptance, and problem-focused coping, and less likely to engage in maladaptive strategies, such as avoidance (Carver et al. 2010). Optimists are also more likely to re-engage with new goals when other goals become unattainable.

Mindfulness, or the ability to attend to the present moment in a nonjudgmental way, is a personality variable that has received increasing attention over the past few years and has been linked to disease adjustment. In a cross-sectional study of adults with multiple sclerosis, mindfulness was related to higher quality of life (Schirda et al. 2015). The ability to regulate emotions mediated the association. Mindfulness has also been linked to psychological health among other diseased populations (for a review, see Keng et al. 2011).

Personality characteristics linked to sex, referred to as gender-related traits, have been investigated in the context of chronic illness. Gender-related traits are typically understood in terms of communion and agency. An agentic or instrumental orientation involves a focus on the self, whereas a communal or an expressive orientation involves a focus on others (Bakan 1966). Agency has been linked conceptually and empirically to being male, whereas communion has been linked conceptually and empirically to being female (Bakan 1966). Agency has been associated with good adjustment to chronic diseases (Helgeson 2012). Potential explanations for this association center on self-esteem and social support. In studies of men with prostate cancer, self-esteem and the ability to express emotions mediated the relations between agency and positive health outcomes. Communion, by contrast, is typically linked to good relationship outcomes but is unrelated to disease adjustment (Helgeson 2012, Helgeson & Fritz 2000).

**Benefit-finding.** One way that people respond to stressful life events, including the onset of chronic disease, is by construing benefits. This response has been widely documented among people with cancer, for example (for a review, see Stanton et al. 2006). Deriving benefits from adversity was one of the features of the original version of cognitive adaptation theory (see the section Cognitive Adaptation Theory) (Taylor 1983) and later became the basis for Tedeschi & Calhoun's (1995) theory of posttraumatic growth (PTG).

Numerous studies have examined the relation between benefit-finding and disease adjustment, and findings have been mixed (Stanton et al. 2006, Tomich & Helgeson 2004). A meta-analytic review of the literature confirmed the mixed relations, showing that benefit-finding was related to reduced depression and more positive well-being, but also to more intrusive thoughts about the illness (Helgeson et al. 2006). It was unrelated to anxiety and global distress.

Although the theory of PTG suggests that growth will facilitate adjustment to disease, it does not specify that growth will be related to reduced psychological distress—at least in the short term. To the extent that people make positive life changes as a result of traumatic events, one would expect growth to be related to positive health outcomes. However, making major life changes is stressful, which may lead growth experiences to be related to negative outcomes, especially if the life changes are still ongoing. In fact, Tedeschi & Calhoun (1995) noted that growth occurs in the context of highly distressing events, which means that PTG may co-occur with distress. This may explain why the link between PTG and good outcomes is more likely to be found when a longer period of time has passed since the stressor onset (Helgeson et al. 2006).

One issue that researchers have wrestled with is the validity of PTG reports (Park & Helgeson 2006). Especially in cross-sectional studies, it is difficult to know whether PTG is a consequence of coping or a coping strategy in and of itself. People may be experiencing actual changes in their lives since the onset of the illness, or people may be construing benefits from adversity as a way to reduce their distress and cope with the illness (McFarland & Alvaro 2000). A study of people who underwent bone marrow transplants showed that patients perceived a decrease in distress from before to after the transplant, but actual distress levels did not change between the two points in time (Widows et al. 2005). Instead, after the transplant people overestimated how distressed they were prior to the transplant.

It is difficult to distinguish perceived growth from actual growth, as the latter requires information about a person prior to the stressor, in this case prior to the onset of the chronic illness. One of the strongest studies to date to distinguish between perceived and actual growth involved college students from four universities who were followed over time to determine who did and did not sustain a major stressor (Frazier et al. 2009). Among those who sustained a stressor, results revealed that perceived growth was unrelated to actual growth (i.e., actual changes in domains from before to after the stressor) and that perceived growth was related to an increase in distress from before to after the stressor. This study not only called into question the veridicality of a person's reports of PTG but also suggested that PTG was used to cope with distress. However, this study did not involve people with chronic disease. In an attempt to address the issue in the case of breast cancer, 5-year breast cancer survivors were compared to a carefully matched control group of women who responded to a stressful event they had experienced in the past 5 years (Tomich et al. 2005). As predicted, survivors reported more benefits from breast cancer than controls did with respect to their major stressor, but survivors also reported more adverse effects of their stressor compared to controls. There were no group differences in overall psychological distress. In a 10-year follow-up study of this same sample, the validity of growth reports was examined by comparing patient reports to reports by significant others of changes patients had experienced (Helgeson 2010). There was little corroboration of patient growth from significant others, and significant others reported that survivors had sustained fewer benefits than the survivors themselves reported. Taken collectively, the evidence for the validity of PTG reports is mixed at best.

One way that these mixed findings have been reconciled is by use of the two-component model of growth, in which the constructive and transformative form of growth is distinguished from the dysfunctional and deceptive form of growth (for a review, see Zoellner & Maercker 2006). The idea that there are adaptive and maladaptive aspects of growth reports is consistent with research that has shown growth to be linked to both adaptive (e.g., problem-focused) and maladaptive (e.g.,

avoidant) coping strategies. For example, a study of people undergoing bone marrow transplants for cancer found that PTG was related to positive reappraisal and problem solving as well as avoidance coping (Widows et al. 2005). The mixed findings from cross-sectional studies might be due to the inclusion of both groups of people—those who are characterized by the functional and those who are characterized by the dysfunctional forms of growth. Longitudinal studies might be more likely to reflect the more constructive form of growth.

**Goals.** One way that people may successfully adjust to chronic disease is to disengage from unattainable goals and reengage with more attainable goals (for reviews, see Rasmussen et al. 2006, Wrosch et al. 2013). A study of women with breast cancer demonstrated the importance of both processes. Women who disengaged from some goals and reengaged with new goals showed the greatest increases in positive affect over a 3-month period (Wrosch & Sabiston 2013). This effect appeared to be mediated by physical activity. In a study of older adults, those who had greater functional disabilities were more depressed only if they had difficulty with goal disengagement (Dunne et al. 2011). Whereas goal disengagement buffered the adverse effects of functional disabilities, goal reengagement did not predict outcomes.

The implications of goals for adjustment to chronic illness might be better understood within a developmental framework. According to socioemotional selectivity theory, people select their goals based on where they are in their life span (Carstensen 2006). In a test of this theory, women with metastatic breast cancer were compared to a healthy control group and asked to identify goals (Sullivan-Singh et al. 2015). Women with breast cancer reported goals with a more limited time perspective (e.g., enjoy present moment, spend time with those close to them) than the comparison group, and these goals predicted positive adjustment for women with breast cancer.

**Other resistance factors.** In addition to the factors described above, other factors have been linked to good disease adjustment outcomes. For example, illness acceptance has been linked to better psychological health among patients hospitalized for chronic medical conditions (heart disease, cancer, kidney disease), and illness acceptance mediates the link between hospital stress and subjective well-being (Karademas et al. 2009). Research on emotion regulation shows links to disease adjustment, such that the avoidance and inhibition of emotion are associated with poor illness adjustment outcomes, whereas the confrontation and expression of emotion are associated with good illness adjustment outcomes (for a review, see de Ridder et al. 2008). Emotional expression has been linked to good adjustment outcomes, but the effects of emotional expression depend on timing with respect to the stressor, the controllability of the stressor, the supportiveness of the social environment, and personality variables (for a review, see Stanton & Low 2012). Rather than elaborate on all of the possible resistance factors, we refer the reader to the references listed in this section.

## Vulnerability Factors

Researchers have also examined a set of factors that predispose a person to have more difficulties adjusting to chronic disease. These vulnerability factors include a pessimistic attributional style and two gender-related traits, unmitigated agency and unmitigated communion. Some specific coping styles can also be considered vulnerability factors. In the following sections, we discuss two of these coping styles, avoidant coping and rumination.

**Pessimistic attributional style.** A person who attributes negative outcomes to stable, global, and internal factors, while also attributing positive outcomes to unstable, specific, and external

factors, is characterized by a pessimistic attributional style. Given that chronic illness is a negative outcome, it would not be surprising if those characterized by a pessimistic attributional style have more difficulty adjusting to chronic disease. This turns out to be the case. Two studies assessed pessimistic attributional style prior to a health event and found links to negative adjustment outcomes years later. In a study of people who had total knee replacement, pessimistic attributional style assessed prior to surgery predicted more severe pain and poorer knee function 2 years later (Singh et al. 2010). A pessimistic attributional style identified prior to heart transplant predicted increased depressive symptoms 4 years post transplant (Jowsey et al. 2012). In addition, a pessimistic attributional style has been implicated in the development of physical diseases such as lung cancer (e.g., Novotny et al. 2010).

**Negative gender-related traits.** Bakan (1996) distinguished agency from its counterpart, unmitigated agency, which reflects a focus on the self to the exclusion of others. Unmitigated agency consists of an overly inflated view of the self and a disregard for and hostile orientation toward others (Helgeson 1994). Numerous studies have linked unmitigated agency to poor adjustment to disease (for a review, see Helgeson & Fritz 2000). One explanation for this link is a reluctance to seek help. For example, a study of persons with heart disease showed that unmitigated agency was linked to longer delays before seeking help for a first heart attack (for a review, see Helgeson 2012, Helgeson & Fritz 2000). A second explanation is difficulty with emotional expression. In a study of men with prostate cancer, difficulties with emotional expression accounted for the relation between unmitigated agency and poor functioning (Helgeson & Lepore 1997). A third explanation involves self-efficacy. In another study of men with prostate cancer, unmitigated agency was related to feeling less capable of controlling illness demands, which was then linked to increased distress and more functional difficulties (Helgeson & Lepore 2004). Finally, a fourth explanation is noncompliance with physician instructions (Helgeson & Fritz 2000).

Taken collectively, many of these explanations as to why people who score high on unmitigated agency evidence poor disease adjustment have to do with poor connections to the social environment—being unable or unwilling to reveal vulnerabilities, unable to seek help, and unresponsive to the help that is offered. Unmitigated agency is related to conflictual interactions with network members (Helgeson & Fritz 2000, Helgeson 2012). A study of persons with advanced cancer showed that unmitigated agency interacted with social support such that social support was related to decreased distress only among persons who scored low on unmitigated agency (Hoyt & Stanton 2011). This is evidence that those who score high on unmitigated agency may not reap the benefits of support.

Although Bakan (1966) never explicitly used the term unmitigated communion, he described the destructive effects of high levels of communion not mitigated by agency. Helgeson (1994) developed a measure of unmitigated communion, which reflects a focus on others to the exclusion of the self. Unmitigated communion consists of overinvolvement in others and self-neglect (Fritz & Helgeson, 1998) and has been linked to poor adjustment to disease among women with breast cancer, women with rheumatoid arthritis, and adults with heart disease (for reviews, see Helgeson & Fritz 1998, Helgeson 2012). The primary mechanism linking unmitigated communion to psychological distress in diseased populations is interpersonal stress. Those characterized by unmitigated communion take on others' problems as their own and become overly involved in and affected by those problems. Another mechanism is poor health care. Because those characterized by unmitigated communion place others' needs before their own, they do not always adhere to physician instructions (for a review, see Helgeson & Fritz 2000). Finally, one study has shown that unmitigated communion is linked to poor adjustment to breast cancer via cognitive adaptation

indicators (Helgeson 2003a). Specifically, unmitigated communion was related to low self-esteem, poor body image, lower optimism, and a greater reliance on external sources of control.

**Avoidance.** A great deal of research links avoidant coping to poor adjustment to a variety of chronic illnesses and medical conditions (for a review, see Stanton et al. 2007). Studies have shown that avoidant coping is linked to increased depression and anxiety among women with breast cancer (Donovan-Kicken & Caughlin 2011) and to a decline in marital satisfaction among their partners (Kraemer et al. 2011). Avoidant coping has also been linked to negative affect in patients with heart failure (Nahlen & Saboonchi 2010). One reason for the links between avoidance and poor outcomes may be lack of social support. People who avoid talking about the illness may not be able to solicit support from network members. One study showed that self-blame and a failure to seek support explained the link between illness avoidance and increased distress (Donovan-Kicken & Caughlin 2011). Rather than as a predictor variable, research is more likely to examine avoidance as a mediator variable linking other variables discussed in this review to outcomes. For example, avoidant coping mediates the link between optimism and good health, as optimists engage less in avoidance (Carver et al. 2010).

**Rumination.** Nolen-Hoeksema (1987) developed a model of rumination and depression that suggested that people who respond to environmental stressors by ruminating have worse outcomes. Rumination consists of thinking about the causes, consequences, and symptoms associated with stressful events. Nolen-Hoeksema and colleagues (2008) suggested that rumination was related to increases in negative affect or depression by (a) interfering with problem solving that would have the potential to reduce depression; (b) increasing the accessibility of other negative thoughts and feelings, which reinforces depression; and (c) leading to difficulties with support networks that would otherwise be potentially helpful.

Some researchers have proposed that rumination mediates the link between chronic disease and depression and that rumination plays a critical role in the maintenance of depression among those who are chronically ill (Soo et al. 2009). Rumination may be one way in which individuals think about their disease and attempt to reconcile how their chronically ill self fits with their previously healthy self—the distorted sense of identity discussed by Charmaz & Rosenfeld (2010). Rumination about anger has been linked to perceiving greater disease severity independent of objective severity in persons with cardiac disease (Leon et al. 2010) and also to increased production of endothelin-1, a peptide and vasoconstrictor, which contributes to atherosclerosis (Fernandez et al. 2010). Rumination can also predict delays in seeking treatment for breast cancer (Lyubomirsky et al. 2006).

## ADJUSTMENT TO CHRONIC DISEASE: SOCIAL ENVIRONMENT

As noted in the introduction to this review, most, if not all, chronic diseases require some form of self-management. Many of these self-care behaviors take place in an interpersonal context; that is, the social environment can influence whether the person with chronic disease adheres to the prescribed regimen.

To address how social network members influence regimen adherence, researchers conducted focus groups with White and Black adults aged 65 or older with a variety of chronic diseases and asked them to identify positive and negative social support strategies (Gallant et al. 2007). Participants identified more positive than negative factors and distinguished between direct and indirect strategies. Instrumental support, defined in terms of specific task assistance, was considered a direct strategy, whereas emotional support, in the form of encouragement, was more of an indirect strategy that motivated the person to take care of him- or herself. There were also direct

and indirect negative strategies. Direct negative tactics included providing unwanted advice or discouraging good health behavior, whereas an example of an indirect negative tactic was failing to alter one's diet to make it easier for the patient to adhere to his or her own diet. In this section, we review the links between illness adjustment and the positive and negative (and direct and indirect) strategies employed by network members.

## **Social Support**

Historically, the literature on social support has identified three main support functions: emotional, instrumental, and informational (House & Kahn 1985, Thoits 1985). Emotional support is defined as the communication of caring and concern, including listening, being there, empathizing, reassuring, and comforting. Informational support is defined as the provision of information to guide or advise, and instrumental support is defined as the provision of concrete assistance or aid. Despite these distinctions, the vast majority of research employs measures that average across multiple kinds of support or focuses on emotional support specifically.

Social support indices that combine across different support functions have been related to better adjustment to chronic illness. Social support has also been linked to better illness self-management (for a review, see Magrin et al. 2015). Social support is especially critical when the regimen is complex, which is the case with diabetes (King et al. 2010). Daily diary studies have linked support on a daily basis to greater physical activity among persons with type 2 diabetes (Khan et al. 2013) and to happier mood, better dietary adherence, and increased exercise in persons with newly diagnosed type 2 diabetes (Helgeson et al. 2016).

The vast majority of research has focused on emotional support and has shown links to disease adjustment; other kinds of support are not nearly as often the subject of investigation (Uchino 2004). The data concerning the relation between instrumental support and disease adjustment have been more mixed. Although instrumental support in the form of concrete assistance can reduce the burden of disease management, it can also communicate that support is needed and that one cannot manage the disease on one's own. To the extent that instrumental support reduces self-efficacy, it will not be linked to good adjustment outcomes, at least in the long term. A daily diary study of adults with newly diagnosed type 2 diabetes showed that daily fluctuations in partner emotional support were linked to daily fluctuations in happy mood, exercise, and dietary adherence (Helgeson et al. 2016), but patient reports of partner instrumental support were not related to mood or self-care behavior. However, partner reports of providing instrumental support were related to better patient mood. The authors suggested that patients may benefit from partner assistance when they are unaware of it, a finding consistent with the literature on invisible support, which is the idea that support provided but not perceived is most strongly connected to health (Bolger et al. 2000). Support received but not perceived does not induce feelings of incompetence or undermine feelings of self-efficacy.

Support providers are most often assumed to be family but may also be friends and health care professionals. LGBT persons may rely less on family and more on friends for support compared to heterosexual persons (Arena et al. 2007).

The most effective support matches the demands of the stressor (optimal matching) (Cutrona & Russell 1990) or the characteristics of the person (Martire et al. 2002). Cutrona & Russell (1990) argued that emotional support is most effective in the case of uncontrollable stressors, in which the need to feel loved, comforted, and accepted is highest, and that instrumental or informational support is most effective in the case of controllable stressors, in which the need for information and assistance to help prevent or solve problems is highest. Their literature review supported this theory. Personal characteristics may also affect who benefits from instrumental support. In two



studies of persons with osteoarthritis, Martire and colleagues (2002, 2011) found that instrumental support in the form of physical assistance was related to good adjustment outcomes among people for whom independence was not central to their self-concepts but was related to poor adjustment outcomes among people for whom independence was central to their self-concepts.

The support-buffering hypothesis (Cohen & Wills 1985) suggests that support is especially beneficial under conditions of high stress. A number of studies have supported this theory. In a study of gynecologic cancer survivors, social support was most strongly related to reduced cancer-specific intrusive thoughts for those under conditions of high stress (Carpenter et al. 2010). In a study of LGB persons who were chronically ill, caregiver relationship quality buffered the effect of discrimination on depression (Fredriksen-Goldsen et al. 2009). In a study of adults with diabetes, cognitive impairment was associated with poor glycemic control, but this effect was reduced under conditions of high social support (Okura et al. 2009).

There are many explanations for the link between social support and good disease adjustment. Cognitive processing has been postulated as one mechanism by which social support is connected to good disease adjustment, in particular reduced psychological distress. In a study of men with prostate cancer, indicators of cognitive processing, such as intrusive thoughts about the illness and searching for meaning or understanding in the illness, accounted for the relation between social support and better mental health (Roberts et al. 2006). Social network members may help individuals process their disease, which then leads to better adjustment. Adherence is another mechanism, as people who have access to social support are more likely to enact positive health behaviors (Cohen 1988). It has also been suggested that social support increases self-esteem, provides one with a sense of identity, and enhances perceptions of control over one's environment (Cohen 1988), all of which have implications for disease adjustment. In a study of persons with end-stage renal disease, social support was linked to increased self-esteem, which in turn decreased depression and increased optimism (Symister & Friend 2003).

## Unsupportive Social Interactions

Supportive interactions are not the only way in which network members can influence disease adjustment. Network members may behave in negative ways, either intentionally or unintentionally (Gallant et al. 2007). Studies that distinguish the supportive from the unsupportive behaviors of network members often find that unsupportive behaviors show even stronger links to health outcomes (Helgeson et al. 2015).

Several mechanisms for the relations between unsupportive behavior and poor adjustment have been examined. A study of women with breast cancer suggested that avoidance is a primary mechanism in this relationship (Manne & Glassman 2000). That is, when network members behave in unsupportive ways—whether intentional or not—people may respond by both cognitive (avoiding thinking about the cancer) and behavioral (avoiding dealing with the cancer) avoidance. In addition, when network members are critical or fail to offer needed help, self-efficacy may be undermined (Manne & Glassman 2000).

**Social constraints.** One specific kind of unsupportive social interaction is known as social constraint. Social constraints appear when network members make it more difficult for persons with chronic disease to discuss their illness by avoiding illness discussions, changing the subject when illness comes up, or acting uncomfortable when illness is discussed. In a study of men with prostate cancer, social constraints by family and friends were related to poorer mental and physical functioning (Eton et al. 2001) and were also associated with more avoidant thinking, which accounted



for the link between social constraints and poorer mental health (Lepore & Helgeson 1998). Social constraints have also functioned as a moderator variable, such that intrusive thoughts about cancer are more strongly linked to poor mental health among those who report high levels of social constraints from network members. A recent innovative study of women with breast cancer used an electronically activated recorder device to record couples' naturalistic conversations over a weekend and showed the benefits of illness discussion when constraints were low. Specifically, illness discussions with their spouses were related to lower levels of intrusive and avoidance thoughts in patients, presumably because the discussions were reciprocal and partners were responsive and encouraged patient disclosure (Robbins et al. 2014).

**Conflict.** Other studies have assessed directly unsupportive behaviors in terms of criticism and conflict and show links between these behaviors and poor outcomes. A study of women with breast cancer showed that unsupportive partner behavior was related to both patient and partner distress (Manne et al. 2014). Avoidant coping mediated the association, such that unsupportive partner behavior was linked to greater patient and partner behavioral disengagement (e.g., withdrawal) and greater patient mental disengagement (e.g., distraction). A study of adults with type 2 diabetes showed that unsupportive family behavior was linked to poor glycemic control, and poor adherence mediated this association (Mayberry & Osborn 2012). In both of these studies, unsupportive behavior was connected to poor outcomes by undermining active coping to address the illness.

**Overprotective behavior.** A well-intentioned but unhelpful behavior in the context of chronic illness is overprotective behavior. Network members who engage in overprotective behavior are trying to be helpful, but their efforts backfire. Overprotective spouse behavior has been associated with decreased improvement in glycemic control following a treatment program for adults with diabetes (Hagedoorn et al. 2006).

## Social Control

Social control in the context of chronic disease has been defined as “attempts to induce needed changes in the health behavior of a partner who has been unable or unwilling to make such changes” (Franks et al. 2006, p. 312). Social control includes network members reminding, if not urging, the patient to enact a health behavior. According to the dual effects hypothesis (Lewis & Rook 1999), social control benefits patient health behavior but at a cost to patient mental health. That is, patients may respond to these control efforts by enacting the appropriate health behavior but be distressed over the interaction, the health behavior, or both, and feel a threat to self-efficacy.

However, the evidence for the dual effects hypothesis is equivocal, as the data concerning the relations of social control to health behaviors and affect have been mixed (Helgeson et al. 2004a, Lewis & Rook 1999). The primary reason for the inconsistent findings is that social control is an umbrella term that captures a variety of distinct strategies. One distinction is between positive and negative social control tactics. Positive strategies have been defined as motivating and encouraging (which have some conceptual overlap with emotional support as described above), whereas negative strategies involve pressure, criticizing, and nagging (Fekete et al. 2006, Stephens et al. 2010). Even this distinction has not always proved useful. In one study, the positive and negative strategies were positively correlated and combined into a single index, obscuring the distinction (August et al. 2013).

A more useful distinction, at least on the surface, is the distinction between persuasion and pressure strategies, with persuasion being the gentler, more acceptable form of control and pressure being the more direct, overtly controlling behavior. These two strategies, however, also seem to

be positively correlated (Martire et al. 2013), and findings have been inconsistent across studies. A study of couples in which one person had knee replacement therapy for osteoarthritis showed that both persuasion and pressure predicted better adherence but were differentially related to affect (i.e., pressure related to negative affect and persuasion related to positive affect) (Stephens et al. 2009), whereas another study of the same population showed that persuasion was unrelated to physical activity but pressure was related to decreased activity among males only (Martire et al. 2013). Persuasion and pressure have also been studied in the context of couples in which one person has type 2 diabetes. In this case, both diet-related pressure and persuasion were related to decreases in dietary adherence (Stephens et al. 2013). Thus, it is not clear that either of these social control strategies is effective in changing behavior. Social control has been linked to poor outcomes through a reduction in self-efficacy or feelings of personal control (Helgeson et al. 2004a).

## DYADIC COPING

Although the vast majority of research on adjustment to chronic illness examines the effects of individual factors, whether one's personality or the perception of one's social environment, on patient adjustment, it is increasingly recognized that chronic illness takes place in an interpersonal context. The illness affects not only the person but also the social environment, and a prominent member of the social environment is the spouse or romantic partner (Gamarel & Revenson 2015). The partner not only is affected by the illness but also has the potential to affect the patient's adaptation. The well-being of patients and partners is intertwined (Segrin et al. 2005).

To address these issues, several theorists have developed the construct of dyadic coping (Bodenmann 1997, Lyons et al. 1998). As the traditional nuclear family declines, dyads may extend beyond romantic partners to involve friends, children, and other relatives, but, to date, studies of dyadic coping have focused on romantic partners. The construct has been conceptualized and measured in several different ways, but the core ideas are that illness is a shared health threat that affects both patients and partners and that both patients and partners are involved in managing the illness (Gamarel & Revenson 2015). One approach to studying dyadic coping has been to examine how couples interact as they deal with the stressor (Bodenmann 1997). In this case, dyadic coping refers to either the management of a stressor that affects the couple directly, such as the loss of a child, or the management of a stressor that primarily affects one partner but is communicated and transferred to the other partner, as is the case with chronic illness. Bodenmann (2005) distinguishes between four kinds of dyadic coping: positive or common dyadic coping, in which both partners are directly affected and work symmetrically; supportive dyadic coping, in which one person is primarily affected and the other assists; delegated communal coping, in which one partner is affected and the other takes over several tasks to reduce stress; and negative dyadic coping, in which the partner attempts to help the actor cope but does so ineffectively, such as through hostility, ambivalence, or superficial dyadic coping. Of these strategies, the clearest health benefits are associated with common dyadic coping (e.g., Rottman et al. 2015).

Dyadic coping has also been discussed by Berg & Upchurch (2007) within a developmental framework. They outline four categories of dyadic coping with chronic illness: uninvolvement (patient copes individually), support (spouse provides emotional or instrumental support), collaboration (joint problem-solving), and control (spouse dominates and tries to control patient's behavior). In a daily diary study of men with prostate cancer, collaborative coping was related to more positive emotions in both husbands and wives (Berg et al. 2008). These effects were partly mediated by the couple's perception that they were dealing effectively with the illness.

Revenson (1994) has examined dyadic coping from the perspective of coping congruence, or use of the same coping strategies by couples. There is some evidence that couples who demonstrate

coping congruence have better outcomes. In a study of couples in which one member did or did not have a chronic illness, couples who were congruent in terms of active coping had higher marital adjustment (Badr 2004). Congruence in other kinds of coping, such as protective buffering and avoidance coping, were not associated with marital adjustment. Researchers have concluded that congruence in adaptive coping strategies may enhance adjustment to chronic illness, whereas congruence in maladaptive coping strategies does not (Berg & Upchurch 2007).

Finally, dyadic coping has been conceptualized in terms of communal coping, as described by Lyons et al. (1998). They defined communal coping as occurring when “one or more individuals perceive a stressor as ‘our’ problem (a social appraisal) versus ‘my’ or ‘your’ problem (an individualistic appraisal), and activate a process of shared or collaborative coping” (Lyons et al. 1998, p. 583). Thus, in the case of chronic illness, communal coping involves both shared illness appraisal and collaboration. The shared illness appraisal has been examined by a number of studies that have focused on communal language, or what has become known as *we* language, and has shown links to good outcomes. For example, in a study of persons with heart failure, spouse *we-talk* predicted positive changes in patients’ symptoms and general health over 6 months (Rohrbaugh et al. 2008). *We-talk* also predicted greater success in quitting smoking following an intervention for persons with heart or lung disease (Rohrbaugh et al. 2012). In our work, we distinguished between patient explicit communal coping (i.e., self-report) and patient implicit communal coping (i.e., pronoun usage) and found that explicit communal coping was related to better patient relationship quality, greater support received from partners, and reduced partner distress (V.S. Helgeson, B. Jakubiak, H. Seltman, L.R.M. Hausmann, & M. Korytkowski, unpublished manuscript). Partner implicit communal coping was related to reduced patient distress and better patient self-care behavior. These results suggest that communal coping may be beneficial for both relationships and health, but that the effects of explicit measures differ from those of implicit measures. Patients may benefit especially from partner communal coping efforts that are less obvious. We also coded communal coping from couples’ behavioral interactions and found that behavioral measures of communal coping were more strongly related to relationship quality, support receipt, patient distress, and patient self-care than were self-report measures (Zajdel et al. 2016).

## **INTERACTIONS AMONG RESISTANCE, VULNERABILITY, AND DYADIC FACTORS**

The literature on adjustment to chronic disease has become increasingly sophisticated in recognizing that the factors discussed in this review do not act in isolation of one another. Studies show that personality variables interact with social environmental variables to predict outcomes, as, for example, independence centrality interacts with instrumental support to predict adjustment (Martire et al. 2002, 2011). It may be that people with more interdependent self-construals benefit more from social support. In a study of people recently diagnosed with type 2 diabetes, the relations between supportive and unsupportive behavior and mood were stronger for people who scored high on unmitigated communion compared to those who scored low (Helgeson et al. 2016). Thus, persons characterized by unmitigated communion may be more strongly affected by the social environment.

Interactions also occur among social environmental variables. Social support and social conflict may have a synergistic effect on outcomes. Research has shown that supportive and unsupportive behaviors interact in such a way that unsupportive behavior is related to poor outcomes only in the absence of supportive behavior (Manne et al. 2003). A study of patients with colorectal cancer found that the link between current helpful and unhelpful spouse behavior and adjustment

depended on past levels of support (Hagedoorn et al. 2011). Current supportive and unsupportive behaviors were linked to good and poor relationship satisfaction, respectively, only when past levels of support were low. When past levels of support were high, current spouse behavior was less likely to be linked to outcomes.

## A NOTE ON INTERVENTIONS

It is beyond the scope of this article to review research on interventions in the case of adjustment to chronic disease (for reviews, see Bohlmeijer et al. 2010, Faller et al. 2013, Martire et al. 2010). However, we would like to note that interventionists are increasingly recognizing that individual variables affect the outcome of an intervention. Some studies have found that personal resources or resilience factors (e.g., optimism, self-efficacy) interact with a psychosocial intervention, such that those with fewer resources receive the most benefit (Helgeson et al. 2000, Scheier et al. 2007). Vulnerability factors also interact with interventions, such that those who are most vulnerable are more likely to benefit. For example, a psychoeducational intervention for men with prostate cancer showed that men who lacked a college education reaped more benefits than college graduates (Lepore et al. 2003). Studies have also found that social environmental resources moderate the benefits of a psychosocial intervention, such that those with less adequate social support benefit more from the intervention (Helgeson et al. 2000).

## FUTURE DIRECTIONS

Future research in the area of chronic disease must recognize that the personal and social factors that influence adjustment to chronic illness do not act in isolation from one another. With demographic variables, in particular, it is important to take an intersectional approach. Intersectionality refers to the ideas that sex, race, ethnicity, social class, age, gender identity, and religion cannot be examined independently of one another and that a focus on a single category is limiting because there is overlap among categories (Cole 2009). For example, a focus on gender in chronic illness will leave much to be desired in understanding how a poor young Black woman adjusts to chronic disease. Intersectionality requires attendance to the diversity within social categories, as well as the observation that there are commonalities across categories that are often viewed quite differently. Some of these commonalities have to do with status and power. This is an important direction for future research on adjustment to chronic illness to pursue.

The literature increasingly recognizes that chronic illness has an interpersonal context. However, much of that research has emphasized the spousal relationship to the exclusion of other relationships, such as relationships with adult children, parents, friends, and extended family. Research on LGBT persons with chronic illness has shown that the primary caregiver is just as likely to be a friend as a partner (e.g., Fredriksen-Goldsen et al. 2009), although ethnicity strongly influenced the relationship of the caregiver to the chronically ill person. For instance, among Fredriksen-Goldsen et al.'s (2009) subjects, 86% of African American patients' caregivers were friends, but 100% of Hispanic patients' caregivers were partners. Understanding the diversity of caregiver relationships is important for extending the research beyond the study of White middle-class couples, as two-parent families and marriage are more common among White people than ethnic minorities. Research has shown that extended family is more prevalent in the lives of Black individuals as opposed to White individuals, and these relationships may have the potential to impact a patient's adjustment process.

Future research should also address the incorporation of time into studies of chronic disease. Convenience samples study people at a single point in time or follow people over time from

an arbitrary starting point. Other studies examine how people initially adapt to the onset of chronic disease. Studies that examine people prior to and following chronic illness are lacking, undoubtedly due to the difficulty in obtaining such samples. However, large longitudinal data sets are increasingly available for researchers to draw on to examine this question. The time course of chronic illness is important not only for understanding psychological and physical health changes over time but also for understanding whether predictor variables are more or less potent at different stages of illness. For example, the literature on PTG shows that benefits increase with time since diagnosis. Sophisticated longitudinal data analytic methods, such as trajectory analysis, may help to address these questions.

Ecological momentary assessment methods have become more common in the area of chronic disease. These methods help to determine what happens on a daily basis and to identify proximal antecedents to adjustment and proximal outcomes from psychological and physical changes. More sophisticated technological advances, including mobile devices and electronically activated recorders, may help advance our understanding of how people are coping with chronic illness in their natural environments.

## CONCLUSION

In this review, we have discussed how chronic disease affects the sense of self and how successful adaptation requires both assimilation and accommodation processes. Adjustment to disease is influenced by contextual factors such as demographic variables and the dimensions of the illness; resilience factors such as self-esteem, optimism, and control; vulnerability factors such as unmitigated agency, unmitigated communion, and rumination; positive social environmental variables such as emotional and instrumental support; negative social environmental variables such as social constraints and social control; and forms of dyadic coping. Each of these factors has unique contributions to functional status and adjustment, as well as to more complicated synergistic effects. Common mechanisms that link resilience factors to disease adjustment include positive health behavior changes, elicitation of social support, increased adaptive coping (e.g., problem-focused coping, positive reappraisal), and enhanced self-efficacy. Common mechanisms linking vulnerability factors to poor disease adjustment include failure to enact appropriate health behavior changes, decreases in self-efficacy, and avoidant coping. Future research in this area would benefit from a more process-oriented approach that takes into consideration the course of chronic disease through time, pinpointing the specific factors that have the strongest effects at each stage of illness.

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The authors are not aware of any affiliations, memberships, funding, or financial holdings that might be perceived as affecting the objectivity of this review.

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