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RUNNING HEAD: Perfectionism and Health

Perfectionism and Health: The Roles of Health Behaviors and Stress-Related Processes

Danielle S. Molnar, Fuschia M. Sirois, Gordon L. Flett, William F. Janssen, and Paul L. Hewitt

— 10,608 words (no tables or figures) —

Overview

In this chapter, we advocate for greater attention to be directed at studying the influence of perfectionism on health and illness. It is from this perspective that our chapter presents a critical examination of the role of perfectionism in health outcomes. Although our analysis focuses primarily on how and why perfectionism relates to health symptoms, we also examine evidence linking perfectionism with difficulties in coping with chronic illness—an assessment that highlights how excessive striving for perfection may be a liability in the context of ongoing health limitations. We then focus on key mechanisms and processes that render certain perfectionists particularly vulnerable to health problems. A significant limitation plaguing the perfectionism and health field is that, aside from a few noteworthy exceptions, research has been largely atheoretical. To this end, we propose two potential pathways that may help further our understanding of why perfectionism might be implicated in poor health outcomes, namely stress and health behaviors.

Introduction

It is important to note at the outset that we view perfectionism as reflecting a behavioral pattern and cognitive, emotional, and motivational orientation toward a form of hyper-conscientiousness that is distinguishable from conscientiousness. We must reiterate from a construct validation perspective that, as conceptualized by Hewitt and Flett (1991), perfectionism is not simply a positive striving for excellence. Rather, it is a relentless pursuit of perfection such that the extreme perfectionist does not simply want to be perfect. He or she demands perfection.

This conceptualization incorporates the irrational importance placed on the need to be perfect that was described by Albert Ellis (2002) and the workaholic, compulsive drive to be perfect emphasized by Spence and Robbins (1992).

This proposed difference between hyper-conscientiousness versus conscientiousness and the associated difference between striving for perfection versus striving for excellence have very important implications when viewed from a health perspective. Clearly, conscientiousness is adaptive in terms of health behaviors and health consequences (Roberts, Walton, & Bogg, 2005) and examination of specific facets has yielded some evidence indicating that the order facet of conscientiousness predicts greater longevity (Kern & Friedman, 2008). Thus, it is hard to deny the benefits of being responsible and striving for excellence. However, when the perfectionistic individual demands absolute perfection from the self and from others, this is a taxing and potentially deadly orientation that results in serious health consequences, especially when perfectionism is combined with difficulties in adapting to life challenges.

Distinguishing perfectionism from conscientiousness, along with other complexities, such as important nuances in terms of how personality factors are assessed and conceptualized, and how they contribute to the onset of illness and less than optimal responses to illness may, in part, explain why we still know relatively little about perfectionism's role in physical health relative to our understanding of the implications that this personality trait has for individuals' well-being (Gaudreau & Verner-Filion, 2012), particularly its consequences for mental health outcomes (Burgess & DiBartolo, 2016). Indeed, the lack of research focusing on how perfectionism may confer risk or resilience for health-related outcomes appears to be a striking omission from the literature given the continuing relevance of personality for a host of significant health outcomes such as morbidity and early mortality (Ozer & Benet-Martinez, 2006; Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007). Furthermore, many theoretical models have been proposed to explain

the associations of personality in general to health (Smith, 2006; Vollrath, 2006). However, to date none of these models have been explicitly applied for understanding how perfectionism may relate to physical health. To address these substantial gaps in the literature we first review the role of perfectionism in health-related outcomes in both healthy and chronically ill samples. We then shift our discussion to address possible pathways that may explain how and why perfectionism is related to a variety of consequential health outcomes.

Perfectionism in Health and Illness in Healthy Samples

It is our contention that individuals high in perfectionism are at an increased risk for a wide variety of illnesses and health problems. Put differently, excessively high standards, equating self-worth with success, high levels of self-scrutiny, fear of failure, and inability to experience satisfaction even when successful contribute to a maladaptive personality style that is linked with increased vulnerability to health problems. Indeed, as reflected in the historical review by Flett, Hewitt, and Molnar (2016), the notion that perfectionism is a vulnerability factor for many health risks is not new; this theme was clearly evident in the medical and psychological literatures in the 1930s and 1940s. As part of his seminal work, Alfred Adler (1938/1998) posited that the behavior of striving towards complete (and unattainable) perfection represents a constant source of pressure within the self that can lead to physiological dysregulation, a notion that is supported by Alexander's (1939) account of a hypertensive man with an inferiority complex and a chronic need to strive for and demonstrate perfection.

Pacht (1984) and Blatt (1995) both emphasized that perfectionism is driven by a fear of failure, extreme self-scrutiny, and self-criticism and underscored the notion that perfectionism is unhealthy. In particular, Pacht (1984) observed that a perfectionistic personality is implicated in myriad dysfunctions that compromise overall health and well-being such as migraines, irritable bowel syndrome, erectile dysfunction, ulcerative colitis, depression, anxiety, and eating

disorders. Indeed, several cross-sectional investigations have supported the conclusion reached by Pacht (1984) and Blatt (1995) that perfectionism is highly relevant in the domain of health. For instance, perfectionism has been implicated in a host of somatic problems such as migraine headaches (Burns, 1980), chronic pain (Van Houdenhove, 1986), headaches (Stout, 1984), and asthma (Morris, 1961). Longitudinal investigations, although relatively few in number, established that elevated perfectionism does indeed predict the experience of greater health symptoms over time. Pritchard, Wilson, and Yamnatz (2007), for example, assessed perfectionism and health symptoms in a sample of undergraduate students at the beginning of the academic year and then again at the end of the academic year. Their findings indicated that perfectionism at the beginning of the academic year predicted experiencing greater health symptoms at the end of the academic year, even after accounting for initial health symptoms. A similar study by Sumi and Kanda (2002) that was conducted in Japan with male undergraduates investigated whether perfectionism predicted increases in health symptoms over a time period of six weeks. Results indicated that men higher in perfectionism reported experiencing more somatic symptoms both cross-sectionally and six weeks later after accounting for initial levels of somatic symptoms.

Although the aforementioned studies offer important insights into the role of perfectionism in physical health, they are limited because perfectionism was conceptualized as a unidimensional construct. This is a major drawback because it is now established that the perfectionism construct is multidimensional, as shown simultaneously by the work of Frost, Marten, Lahart, and Rosenblate (1990) and Hewitt and Flett (1990, 1991). Indeed, several models and scales of multidimensional trait perfectionism continue to be commonly employed (Sirois & Molnar, 2016). Further, mounting evidence indicates that the prevailing measures of trait perfectionism may actually assess two underlying higher-order factors (i.e., perfectionistic

concerns [PC] and perfectionistic strivings [PS]) that tend to be differentially related to a wide variety of outcomes (Dunkley & Blankstein, 2000; Frost, Heimberg, Holt, Mattia, & Neubauer, 1993; Stoeber & Otto, 2006). PC consist of severe self-scrutiny, excessive concern over mistakes and others' evaluations, beliefs that others demand perfection from the self, perceptions of not living up to self- or other-imposed exacting standards, and disproportionate reactions to perceived failures whereas PS are comprised of the setting and compulsive striving toward excessively high standards.

A study from Molnar, Reker, Culp, Sadava, and DeCourville (2006) provides a vivid illustration of the importance of considering perfectionism as a multidimensional construct when examining perfectionism in the context of health. Differentiating socially prescribed from self-oriented perfectionism (see Hewitt & Flett, 1991) in an adult community sample, this study found that PC (socially prescribed perfectionism) were associated with poorer health via higher levels of negative affect and lower levels of positive affect, whereas PS (self-oriented perfectionism) were associated with better health via lower levels of negative affect and higher levels of positive affect. Findings from a study conducted by Ofoghi and Besharat (2010) also emphasize the important of multidimensional conceptions of perfectionism when examining health. They found in a sample of Iranian adults that PS (self-oriented perfectionism) were associated with fewer self-reported physical symptoms and more positive perceptions of health. Conversely, PC (socially prescribed perfectionism) were associated with experiencing greater physical symptoms and poorer perceived health. These studies are unique in that they indicate that perfectionism does not invariably compromise health.

Other studies have highlighted the role of both PC and PS in somatic symptoms. Martin, Flett, Hewitt, Krames, and Szanto (1996) found that PS (self-oriented perfectionism) and PC (socially prescribed perfectionism) were positively associated with physical health complaints in

a sample of university students at the level of bivariate correlations. However, they found that the effect of PC was stronger than that of PS because only PC continued to be a significant predictor of physical health complaints when the other study variables were entered into the regression equation. Moreover, they observed a significant interaction between PC and self-efficacy when predicting health complaints such that individuals who reported the highest levels of PC and the lowest levels of self-efficacy reported the poorest health.

Saboonchi and Lundh (2003) found in a Swedish general population sample that PS (self-oriented perfectionism) and PC (socially prescribed perfectionism) were each positively correlated with somatic complaints such as daytime sleepiness, headaches, tension, and insomnia. Whereas the association between PC and somatic complaints was statistically significant only for women, PS and PC were both associated with experiencing more negative affect and less positive affect, a finding that puts into question the notion that PS represent a healthy form of perfectionism.

Perhaps the most striking evidence for the role of perfectionism in health comes from a unique study that examined whether perfectionism is a contributing factor in all-cause mortality. Fry and Debats (2009) found that PS (self-oriented perfectionism) was longitudinally predictive of all-cause mortality over a time period of six and half years in a sample of older adults (ranging in age from 65 to 87 years) such that individuals with high PS scores (70th percentile and above) were at a 51% increased risk of death relative to individuals with low PS scores (30th percentile and below). Moreover, they found that PS remained as a risk factor for early all-cause mortality once other health-related variables (e.g., age, social support satisfaction, index of disability in daily life, and the number of medical visits to health-care providers during the previous year) were accounted for in the analyses. It is noteworthy that PC were largely unrelated to all-cause mortality in that study. It is also worth noting that the predictive role of trait perfectionism was

evident when perfectionism was examined along with other personality traits related to health outcomes (e.g., conscientiousness and neuroticism).

Collectively, the studies reviewed thus far indicate that perfectionism is indeed relevant for health, and it is tempting to surmise that perfectionism is a risk factor for poorer health. However, this research also hints at the idea that PS may not always be detrimental to health and may even carry some health benefits, given that PS were associated with better health in some of the studies. Further, these results were limited to relatively healthy populations, which raises the question of what the health implications of perfectionism are in not so healthy populations. If we view living with chronic illness as being akin to living with a chronic stressor, then the apparent differential relations of PC and PS with physical health may not necessarily hold for health-challenged populations. To the extent that both perfectionism dimensions are associated with less adaptive responses and outcomes when in the context of stressful and limiting circumstances, perfectionism may be a particular liability for poor health-related outcomes in those with chronic illness. Moreover, stress and its deleterious effects experienced may be amplified by attempts to strive for perfection while living in the imperfect world of chronic illness. In the next section we critically review the literature linking perfectionism to adjustment in the context of chronic illness.

Perfectionism in Chronic Illness

Although the study of perfectionism in chronic illness is in its infancy, both theory and preliminary empirical evidence suggest that perfectionism plays an important role in the etiology and maintenance of several chronic illnesses. Molnar, Sirois, and Methot-Jones (2016), for example, have proposed a theoretical model in which perfectionism contributes to poor adjustment and adverse health outcomes in the context of chronic illness via both intrapsychic (i.e., perceived control and self-evaluative tendencies) and interpersonal processes (i.e., self-

concealment and social support) through the amplification of stress and maladaptive coping processes. Indeed, the picture that emerges from the research described below is that perfectionism appears to amplify stress and maladaptive responses, which, in turn, complicates adjustment to illness. For example, one investigation found that each of the subscales of the Frost Multidimensional Perfectionism Scale (FMPS; Frost et al., 1990) predicted greater tinnitus distress and higher levels of depression and anxiety among tinnitus sufferers (Anderson, Airikka, Buhrman, & Kaldo, 2005). This is not surprising in light of the robust associations between perfectionism and maladaptive coping in both healthy (Dunkley, Solomon-Krakus & Moroz, 2016; Hewitt & Flett, 2002) and chronically ill samples (Sirois & Molnar, 2014).

A recent review of the literature also reveals robust associations of perfectionism with poorer mental and physical outcomes among people coping with chronic fatigue syndrome (see Kempke, Van Houdenhove, Claes, & Luyten, 2016). Luyten et al. (2011) showed that self-critical perfectionism predicted greater stress generation which, in turn, predicted depression. The same team of investigators demonstrated in a large sample of patients with chronic fatigue syndrome that PC (concern over mistakes and doubts about actions) were associated with depression and that self-esteem mediated the association between PC and depression (Kempke, Luyten, et al., 2011). These data illustrate the need to examine self-concept variables as contributors to the link between perfectionism and health problems in general and coping with chronic illness in particular.

At first glance, there appear to be differential associations between dimensions of perfectionism and health-related outcomes in the context of chronic fatigue syndrome. Kempke, Van Houdenhove, et al. (2011), for example, investigated the role of PC (concern over mistakes and doubts about actions) and PS (personal standards) on physical health in a sample of adult patients diagnosed with chronic fatigue syndrome. Findings indicated that only PC were

significantly and positively associated with poorer physical health among patients and that this association was mediated by depression. These results are congruent with White and Schweitzer (2000) who also found that patients with chronic fatigue syndrome scored significantly higher on PC (concern over mistakes and doubts about actions) than controls.

Research from our labs has found that perfectionism is also related to health functioning in women with fibromyalgia, a rheumatic condition characterized by muscular or musculoskeletal pain. Molnar, Flett, Sadava, and Colautti (2012), for example, found that PC and PS (socially prescribed and self-oriented perfectionism, respectively) were both associated with lower health functioning in adult women diagnosed with fibromyalgia. Specifically, in the case of PS, there was a curvilinear relationship between perfectionism and health such that very low and very high levels of PS were related to considerable reductions in health functioning whereas moderate levels appeared to be relatively adaptive (i.e., associated with better health functioning). Thus, our work builds upon the extant literature to further demonstrate the complex relationship that exists between specific dimensions of perfectionism and physical health in the context of chronic illness.

Finally, the deleterious impact of perfectionism in chronic illness is further illuminated by Flett, Baricza, Gupta, Hewitt, and Endler (2011) who examined the extent to which trait perfectionism (Hewitt & Flett, 1991) and perfectionistic self-presentation (Hewitt et al., 2003) are associated with coping and psychosocial adjustment in patients with Crohn's disease and ulcerative colitis. The focus on perfectionism in these individuals was suggested by previous work noting the prevalence of perfectionism in patients with these illnesses. For instance, psychiatric evaluations in one study found that 25 of 30 patients with ulcerative colitis had elevated perfectionism (Holub & Kazubaska, 1971). Flett et al.'s (2011) study showed that both trait perfectionism and perfectionistic self-presentation were associated with a maladaptive

emotional preoccupation form of coping with this chronic illness. In addition, trait perfectionism and perfectionistic self-presentation were associated robustly with greater sickness impact ratings in terms of the psychosocial impact of Crohn's disease and ulcerative colitis. Importantly, the pattern of findings described above held even after accounting for the impact of other personality factors such as conscientiousness and optimism. When they are conducted, comparative tests show that perfectionism remains a significant predictor of health outcomes and maladaptive illness responses after taking into account the effects of broad factors such as neuroticism, conscientiousness, and optimism (e.g., Fry & Debats, 2009). Consequently, it cannot be concluded that perfectionism is merely a form of neurotic conscientiousness that is redundant with broader personality orientations.

Perfectionism and Health: The Stress Pathway

Consistent with models linking personality to health (e.g., Friedman, 2000; Smith, 2006; Suls & Rittenhouse, 1990), the final section of our chapter proposes that perfectionism may contribute to detrimental health outcomes via a direct, stress-related route and an indirect, behavioral route. Our discussion is also guided by theoretical advancements in the field of perfectionism such as the diathesis-stress model of perfectionism (Hewitt & Flett, 1993, 2002) and the self-regulation resource model (Sirois, 2015, 2016). Key issues and directions for future research are also included to further advance this rich and important area of research.

Theoretical models linking personality to health provide a foundation for our proposed pathway linking perfectionism to health via stress processes. Research aimed at understanding the effects of stress on the body indicates that stress, particularly prolonged or chronic stress, negatively impacts virtually all systems of the body and is linked with all leading causes of early mortality (Cohen, Janicki-Deverts, & Miller, 2007; Juster, McEwen, Lupien, 2010).

Complementary findings have been discovered in the field of human psychoneuroimmunology

with studies showing that stressful life events contribute to increased vulnerability to infectious illnesses such as the common cold (Cohen, Tyrrell, & Smith, 1991; Cohen & Williamson, 1991; Lacey et al., 2000) as well as adverse health (Jorgensen, Frankowski, & Carey, 1999).

Seegerstrom (2000) hypothesized that personality constructs can affect health via several different pathways. In particular, personality may directly affect the amount or quality of stress experienced which, in turn, has downstream effects on the immune system. However, Seegerstrom also cautioned that this pathway is complicated such that personality contributes to the exposure of stressors *and* to the resulting reactivity to these stressful events. In addition, she postulated that other potential pathways, such as health behaviors, may contribute to health-related outcomes either by exacerbating the effects of stress or by having direct effects on health.

According to the diathesis-stress model of perfectionism (Hewitt & Flett, 1993, 2002) stress can mediate (i.e., represent an explanatory pathway from perfectionism to health) or moderate (i.e., exacerbate or ameliorate risk or resilience) the relationship between perfectionism and psychopathology. Specifically, Hewitt and Flett focused on four important aspects of stress: stress generation, stress anticipation, stress perpetuation, and stress enhancement. With respect to stress generation, Hewitt and Flett (2002) suggested that perfectionists are extensively engaged in stress exposure by continuously pursuing impossible standards. Another possibility is that perfectionists may generate extensive interpersonal conflict by feeling pressured by others, or by finding fault with others (see also Chapter 6).

An overview of existing research and theory on perfectionism and stress is provided below. First, however, we consider two key questions that have not been the subject of extensive consideration thus far in the perfectionism and health field: When considering possible pathways to illness for perfectionists, why is it important to focus extensively on the role of stress in perfectionism and health? And, given the heterogeneity that exists among perfectionists, which

perfectionists are most susceptible to the stress-induced health problems?

Regarding the first question, our focus on the role of stress is based on our contention that perfectionists, relative to non-perfectionists, are faced with substantially higher, if not overwhelming levels of stress throughout their lives. This stress can come in many forms. Typically, researchers have focused on the stress that is a result of experiencing major life events and daily life hassles (see Hewitt & Flett, 2002). However, other forms of stress are also quite commonly experienced. For instance, research on interpersonal perfectionism and self-critical perfectionism shows that perfectionism is associated with a greater frequency of negative social interactions (Dunkley, Sanislow, Grilo, & McGlashan, 2006; Flett, Hewitt, Garshowitz, & Martin, 1997) and daily event studies point to a link between perfectionism and a tendency to both experience and contribute to interpersonal conflicts (Mackinnon et al., 2012; Sherry, Gralnick, Hewitt, Sherry, & Flett, 2014). This evidence should be particularly disconcerting for perfectionists given the substantial impact that negative social exchanges can have on people in terms of their health and well-being.

We maintain that the link between perfectionism and stress has been underestimated in most research investigations because perhaps the most salient form of stress for perfectionists has seldom been assessed: pressure. Extreme perfectionists are under constant and unrelenting pressures to be perfect or to seem perfect and live up to their own self-imposed demands or the demands of other people. It is when these pressures are considered that the difficulties and challenges facing successful perfectionists are perhaps most apparent because being successful means that the ongoing pressures to be perfectly successful can become even greater. We maintain that these pressures will lead to emotional and physical exhaustion, especially among those perfectionists who evaluate their lives according to the activity-based self-worth contingency identified by DiBartolo, Frost, Chang, LaSota, and Grills (2004). This self-worth

contingency is based on the notion that, for perfectionists to feel good about themselves (or avoid feeling bad about themselves), they must be active and they must be striving at all times.

Weiten (1998) has examined pressure as a form of stress, and he developed a multifaceted inventory that yields an overall assessment of pressure, as well as pressure in various life domains (e.g., family, school) and self-imposed pressure. Previously, Hewitt and Flett (2002) reported unpublished results showing in sample of 100 students that self-oriented perfectionism and socially prescribed perfectionism were associated with elevated pressure as assessed by Weiten's (1998) Pressure Inventory. Moreover, there was a robust correlation of $r = .65$ between overall pressure and scores on the Perfectionism Cognitions Inventory (PCI) which assesses the frequency of current automatic thoughts involving perfectionism (Flett, Hewitt, Blankstein, & Gray, 1998). We have reexamined these associations in a second sample of 104 university students and found that self-oriented perfectionism was not associated with overall pressure scores, though it was linked positively with school-related pressure. However, associations were found once again between overall pressure and both socially prescribed perfectionism ($r = .37$) and PCI scores ($r = .54$).

An insightful study by Stoeber and Rennert (2008) also illustrates the potential destructiveness of pressure. They evaluated perfectionism and the correlates of burnout in 118 secondary school teachers. They developed three measures to assess the extent to which teachers felt a pressure to be perfect emanating from colleagues, students, and students' parents. Their results showed that all three forms of pressure were associated with emotional exhaustion, depersonalization, and overall levels of burnout as well as negative cognitive appraisals involving threat and loss. Given that such pressures can be quite unrelenting, it seems that pressure is a form of stress that can have a profound negative influence on the health and well-being of vulnerable perfectionists.

As for our second question of which perfectionists are most susceptible to stress-related health problems, we maintain that the most susceptible perfectionists are the people who have the “perfectionistic reactivity” that was described recently by Flett and Hewitt (2016). The essence of the perfectionistic reactivity concept is that much of the vulnerability and risk inherent in feeling a pressure to be perfect is based on how people react when their daily events and experiences are not perfect and they see that their lives are not working out in a manner that fits with their idealized vision of how life should be. According to Flett and Hewitt, perfectionistic reactivity includes a wide range of maladaptive cognitive, emotional, motivational, and behavioral reactions that reflects the all-or-none self-evaluative tendencies of perfectionists. At the cognitive level, this includes an extensive array of various forms of perseverative cognitions. The concept of perfectionistic reactivity when viewed from a cognitive perspective has clear health implications in light of the findings that support Brosschot, Gerin, and Thayer’s (2006) perseverative cognition hypothesis (see also Flett, Nepon, & Hewitt, 2016).

We contend that the perfectionists who are most likely to be susceptible to health problems are those reactive perfectionists who are also particularly prone to make extreme negative inferences about themselves. These negative inferences can come in the form of an abiding sense of shame and the sense that the inadequacies and characterological deficits in the self have been exposed and are on display for everyone to see. Perfectionists who are overcome by a sense of shame must come to terms with the sense of being exposed, but also their own personal sense of being exposed to themselves as individuals who are not perfect and likely never will be perfect.

But it is even more problematic for distressed, demoralized, and defeated perfectionists when the stress, pressures, and sense of inadequacy that they are experiencing combine to create a deep sense of hopelessness that contributes to a sense of coping inefficacy. Hopelessness is

different from helplessness or pessimism in that the negative outcome expectancies are accompanied by a profound sense of being incapable of doing anything to overcome the stressors and pressures facing the individual. We suggest that certain perfectionists are highly susceptible to hopelessness and this can have grave consequences given the growing literature of the role of hopelessness in both the etiology of health problems and the exacerbation of existing health problems (e.g., Kuosmanen et al., 2016). A general form of global hopelessness should be a strong mediator of the link between perfectionism and health problems, but a more specific form of social hopelessness should serve as a mediator of the link that interpersonally-based components of the perfectionism construct (i.e., socially prescribed perfectionism and perfectionistic self-presentation) have with physical health indices. In light of these observations, research is clearly needed to examine the role of possible mediators that reflect the negative self-evaluative tendencies of vulnerable perfectionists.

Finally, it is important to remain cognizant of the fact that there is substantial heterogeneity among perfectionists, and some perfectionists have been dealing with a level of stress that started very early in their lives. Flett, Hewitt, Oliver, and Macdonald (2002) described several developmental models that delineate pathways to perfectionism, and one of these models (i.e., the social reaction model) suggests that striving to be perfect is a lifelong coping response for some people. Some people have a perfectionistic orientation that is underscored by an extensive history of early adversities, and their perfectionism is largely an attempt to limit further stressors and traumas. We noted in a recent commentary that the notion that certain perfectionists have experienced significant trauma has not received extensive consideration in the literature thus far (see Flett, Molnar, & Hewitt, 2016), and it is important that this void in the literature is addressed sooner than later. One potentially important focus within this area of research is to assess the physical health status of perfectionists in terms of not only their current experiences,

but also their possible past history of traumatic experiences.

With these concepts in mind, we now provide an overview of the existing literature on perfectionism and stress. In general, research has supported Flett and Hewitt's (1993, 2002) notion that perfectionism generates stress, which, in turn, leads to greater psychopathology and a poorer sense of well-being over time (see Dunkley et al., 2016). For instance, Chang, Watkins, and Banks (2004) found that stress fully mediated the relationship between perfectionism and negative affect among Black women and partially mediated the relationship among White women. Employing daily-diary methodology over a six-month period with a sample of community adults, Dunkley, Ma, Lee, Preacher, and Zuroff (2014) found that PC (self-critical perfectionism) predicted daily elevations in negative affect and more persistent negative affect via two stress-related processes: the "disengagement trigger pattern" and the "disengagement maintenance pattern," respectively (p. 93; see also Chapter 5). Each of these patterns consist of negative appraisals about the self (e.g., event stress) and negative appraisals concerning others (e.g., perceived criticism) along with coping strategies that are characterized by disengagement (e.g., avoidant coping) that mediated links between PC and increases in daily negative affect (disengagement trigger pattern) and more persistent negative affect across six months (disengagement maintenance pattern). Furthermore, as noted above, Luyten et al. (2011) have provided initial evidence for stress generation among self-critical perfectionists coping with illness. Taken together, these results provide strong support for the notion that some perfectionists generate stress for themselves and that this stress is, in part, created by their reliance on negative cognitive appraisals and their use of avoidant coping strategies.

Once stress is generated, perfectionists are at risk for distress and, as we now suggest, they are also prone to health problems, due to their heightened stress reactivity and their inability to regulate their stress levels. Recent data from a study that used a multifaceted self-report

measure of vulnerability to stress reactivity suggest that perfectionists are highly reactive to failure experiences. Also, people with elevated levels of socially prescribed perfectionism and frequent thoughts about needing to be perfect are highly reactive to social evaluation and reported more prolonged stress reactivity (Flett, Nepon, Hewitt, & Fitzgerald, in press). Likewise, a longitudinal study of stress in students found that perfectionistic students transitioned into a higher stress category after experiencing academic failure (Rice, Ray, Davis, DeBlaere, & Ashby, 2015). This finding also highlights the merits of applying the diathesis-stress model by underscoring the role of the social context.

Experimental evidence also supports the link between perfectionism and stress reactivity. For example, McGirr and Turecki (2009) found in a community sample of adults that self-criticism (a construct that forms part of self-critical perfectionism) predicted greater stress reactivity as evidenced by higher salivary alpha-amylase (a biomarker of stress) after exposure to a psychosocial stressor. Furthermore, Wirtz et al. (2007) found in their study of middle-aged men that PC (particularly concern over mistakes) were associated with higher cortisol stress reactivity, including hypothalamic-pituitary-adrenal (HPA) axis activation in response to a psychosocial stressor. A subsequent study of maladaptive perfectionism by Richardson, Rice, and Devine (2014) found evidence of stress reactivity with respect to cortisol stress response following exposure to a stress test that involved social-evaluation threats.

Maladaptive coping styles and other maladaptive responses also tend to characterize perfectionists, which contribute to stress reactivity, anticipation, and perpetuation (see Dunkley et al., 2016, and Chapter 5). It has already been noted within the context of chronic health problems that people high in perfectionism tend to rely on an emotion-oriented coping style that can exacerbate health problems (Flett et al., 2011; Sirois & Molnar, 2014). More generally, Flett, Nepon, and Hewitt (2016) provide compelling evidence to support their cognitive model of

perfectionism, which posits that both PC and PS contribute to chronic forms of cognitive perseveration, such as rumination, resulting in the protraction of the stress response that has downstream effects for adverse health outcomes.

Although there is relatively little empirical work on the proposed perfectionism, stress, and health pathway, some research does support the validity of our assertion. Initially, Fry (1995) established that trait perfectionism combines with daily hassles to produce elevated physical symptoms. Organista and Miranda (1991) similarly showed that perfectionism interacts with life events to predict psychosomatic symptoms. Specifically, individuals higher in perfectionism who also experienced a high number of events that threatened self-esteem showed elevated psychosomatic symptoms. The results of these studies accord with findings indicating that perfectionists exposed to stress tend to have health-related reactions (Dittner, Rimes, & Thorpe, 2011) and the experience of daily hassles seems to underscore the link between trait perfectionism and headaches (Bottos & Dewey, 2004).

The likely importance of exposure to chronic stress should not be underestimated given that socially prescribed perfectionism entails chronic and ever-present stress due to the sense of hopelessness about ever being able to please others and meet their impossible demands (Flett & Hewitt, 2002). Chronic stress also plays an especially important role in health and disease because it is a known precursor of allostatic load or “wear and tear” on the body, which lays the groundwork for the development and exacerbation of illness and disease (Cohen et al., 2012; Juster et al., 2010). Consequently, the chronic exposure to stress, or “toxic stress,” experienced by perfectionists due to their constant strivings, internal pressures, and ruminative tendencies can be considered a direct health risk.

Indeed, theory and research support this contention. With respect to chronically ill samples, Kempke et al. (2016) implicate stress processes as central mechanisms that explain

perfectionism's role in both the etiology and maintenance of chronic fatigue syndrome. More specifically, the theoretical model put forth by Kempke and colleagues posits that perfectionism has downstream effects for cumulative stress that over time creates “wear and tear” on the body. This cumulative stress leads to dysregulation of the HPA axis, which, in turn, results in stress intolerance and then chronic fatigue. Increasing evidence supports their model, as findings indicate that PC is linked to chronic stress and to changes in the neurobiological functioning implicated in chronic fatigue syndrome (Van Houdenhove, Luyten, & Kempke, 2013). These intriguing findings may also provide important insights that generalize to other illness groups and to healthy samples.

Concerning general samples, Flett, Molnar, Nepon, and Hewitt (2012) examined perfectionism, daily hassles, and psychosomatic symptoms in 228 university students. Perfectionism was assessed in terms of perfectionistic automatic thoughts using the PCI, and they found that daily hassles mediated the link between perfectionism and psychosomatic symptoms. A more comprehensive investigation by Molnar, Sadava, Flett, and Colautti (2012) involved a web-based survey that was completed by 538 undergraduate students. Molnar et al. found that there was a positive association between socially prescribed perfectionism and poor health, and that this association was fully mediated by higher levels of perceived stress and lower levels of perceived social support. Further, these findings held even after accounting for the effects of conscientiousness and neuroticism, thus attesting to the unique predictive ability of perfectionism.

Collectively, a burgeoning research literature lends support to the notion that stress is a key pathway linking perfectionism to health and illness. Given findings demonstrating that perfectionism is implicated in stress processes—namely stress generation, reactivity, anticipation, and perpetuation—researchers are encouraged to assess multiple indicators of stress

that tap each of these related, yet distinct, processes. Examination of specific stress processes will not only provide a much more fine-grained analysis of how perfectionism contributes to stress and health, but will directly inform prevention and intervention efforts aimed at ameliorating the deleterious effects of perfectionism on adverse health outcomes. Programmatic research employing prospective longitudinal designs to explore the mutual effects of cumulative toxic stress and its resulting allostatic load also provides a valuable unifying framework to further explore associations between perfectionism and health over the life course. Although research on the daily impact of perfectionism on well-being, including stress and psychopathology, is accumulating (Dunkley, et al., 2014; Dunkley, Zuroff, Blankstein, 2003; see also Chapter 5), research employing daily diary methodology is also needed to further understand the processes that link perfectionism to stress and physical health at a more immediate level.

Perfectionism and Health: The Health Behaviors Pathway

A second and equally important pathway linking perfectionism to physical health outcomes is that of health behaviors. Commonly referred to as modifiable risk factors for the prevention of illness (World Health Organization, 2011), health-promoting behaviors such as healthy eating, regular activity, and good sleep behaviors are well recognized as key factors for determining health trajectories and associated outcomes such as morbidity and mortality (Bogg & Roberts, 2013; Hampson, Goldberg, Vogt, & Dubanoski, 2007). Conversely, smoking, excessive alcohol use, sedentary behaviors, and an unhealthy diet are established determinants of poor health and disease (World Health Organization, 2011). Despite these obvious links to physical health, and the recognized role of health behaviors within personality and health models, understanding how and why perfectionism may foster or prevent the practice of important health-promoting behaviors remains a largely understudied area within the

perfectionism and health literature. At the time of this writing there were only six published studies available on this topic (Andrews, Burns, & Dueling, 2014; Chang, Ivezaj, Downey, Kashima, & Morady, 2008; Harrison & Craddock, 2016; Molnar, Sadava, et al., 2012; Sirois, 2016; Williams & Cropley, 2014).

Among this handful of studies that examine perfectionism and health-promoting behaviors, there are both consistencies and inconsistencies depending on the way in which perfectionism and health behaviors are conceptualized and measured. In terms of consistencies, the available evidence generally indicates that PC are associated with less frequent practice of health-promoting behaviors. For example, in research conducted by Chang et al. (2008) and Williams and Cropley (2014), PC (concern over mistakes, doubts about actions, socially prescribed perfectionism) as well as perceived parental pressure to be perfect (parental expectations, parental criticism) were negatively associated with measures of general health behaviors, which included positive health behaviors (e.g., healthy eating, regular exercise) and avoidance of negative or health risk behaviors (e.g., smoking). The negative link between PC and health-promoting behaviors has also been noted in undergraduate students in both cross-sectional research (Harrison & Craddock, 2016; Molnar et al., 2012) and short-term longitudinal research (Andrews et al., 2014) in which PC were measured with scales capturing socially prescribed perfectionism (Hewitt & Flett, 1991) and negative perfectionism (Terry-Short, Owens, Slade, & Dewey, 1995), respectively. Notably, these findings have also been replicated in a study with community adults (Sirois, 2016) where PC (socially prescribed perfectionism) were negatively associated with a validated measure of the frequency of general health-promoting behaviors (i.e., regular exercise, healthy eating habits, stress management). The convergence of these findings with respect to PC is particularly notable given the variety of measures used to assess this perfectionism dimension across the different studies.

With respect to PS, the findings are less consistent. Across the six published studies, PS were positively associated with measures of health behavior in only two studies (Andrews et al., 2014; Williams & Cropley, 2014). In the other four studies, PS were either not significantly associated with health behaviors (Harrison & Craddock, 2016; Molnar, Sadava, et al., 2012; Sirois, 2016) or were sometimes related and sometimes unrelated to health behaviors depending on the perfectionism measure that was used (Chang et al., 2008).

Further evidence that PC and PS are differentially related to health behaviors comes from a meta-analysis of data sets from one of the authors' lab. Across all seven data sets ($N = 2,213$) which included both community and student samples, PC were significantly associated with lower scores on a measure assessing the frequency of a range of health-promoting behaviors (average $r = -.21$) whereas PS were significantly associated with higher scores in three of the seven data sets and not significantly associated in the remaining four data sets (Sirois, 2013). Accordingly, the average association of PS with the frequency of health-promoting behaviors was not statistically significant (average $r = .09$).

Having addressed the question of *how* perfectionism may be linked to health behaviors, we now turn our attention of the important question of *why* perfectionism may be linked to the practice of health behaviors. As noted previously, there has been little research focused on this perfectionism–health pathway, and less still on understanding the potential mechanisms that might explain the differential relations of perfectionism dimensions to health behaviors. Emerging theory and research suggest that differences and deficits in self-regulation capacities may help explain why PC create risk for health behaviors and subsequent health whereas PS may not pose a risk. Self-regulation, the capacity of being able to control one's thoughts, feelings, and actions (Forgas, Baumeister, & Tice, 2009), is critical for the performance of health behaviors. Health behaviors often require forgoing immediate desires, temptations, and

pleasures in lieu of the long-term rewards associated with maintaining good health and reducing the risk of disease. Accordingly, successful performance of health behaviors can be compromised when self-regulation capacities or resources are depleted.

The self-regulation resource model (SRRM; Sirois, 2015, 2016) is one theoretical approach that has been applied for understanding why perfectionism may relate to health behaviors. Derived from research on the role of affect in self-regulation, the SRRM posits that individuals will be more likely to engage in health behaviors to the extent that they have available internal resources, such as positive affect and a future time-orientation, and low levels of negative affect. Negative affect is one key factor that can threaten self-regulation and derail the practice of important health behaviors (Wagner & Heatherton, 2015), in part because it saps valuable resources needed for effective self-regulation (Sirois, 2015; Sirois & Hirsch, 2015). Not surprisingly, PC, but not PS, are robustly associated with high levels of negative affect, including stress and anxiety (Sirois, 2016), which is consistent with this self-regulation view of perfectionism and health behaviors. In a direct test of the SRRM's view of perfectionism and health behaviors, higher levels of negative affect explained in part the association between PC and fewer health behaviors in a community sample of adults (Sirois, 2016). Together this theory and evidence suggests that the frequent and negative thoughts about not having attained goals, or of not living up to other people's standards that characterizes PC, may drain the self-regulation resources needed to perform important health behaviors, and therefore create risk for poor health outcomes.

The higher levels of stress associated with perfectionism, and PC in particular, noted earlier may also have some spillover effects with respect to health behaviors. Research has demonstrated that stress interferes with the practice of a range of health-promoting behaviors (Sirois, 2007). From a self-regulation perspective, this make sense if we consider that stress is

experienced as a negative emotional state, and therefore is expected to be disruptive to effective self-regulation. Indeed, in the meta-analysis of seven data sets noted previously (Sirois, 2013), this hypothesis was tested in five of the seven data sets with a mediation analysis. In all five data sets, stress was a significant mediator of the relationship between PC and fewer health-promoting behaviors, with standardized paths (betas) ranging from $-.16$ to $-.60$. Although more research is clearly needed to confirm and expand on these findings to better understand the potential cross-over associations between the stress and health behavior pathways linking perfectionism to health outcomes, this preliminary evidence provides one of the first theoretically driven views of why PC may compromise the practice of important health behaviors.

Conclusions and Future Directions

In this chapter we provided evidence supporting perfectionism's role in health-related outcomes in both healthy and chronically ill populations. Using theories linking personality to health along with the diathesis-stress model of perfectionism (Hewitt & Flett, 1993, 2002) and the self-regulation resource model (Sirois, 2015, 2016) as guiding conceptual frameworks, we further underscored the importance of both stress processes and health behaviors as potential mechanisms that may explain how and why perfectionism may contribute to health and illness. What is now required is conceptually driven and methodologically sound research that will enable us to gain a better appreciation and understanding of the associations that perfectionism has with illness and the mechanisms and processes that contribute to this association. Future research would also benefit from an examination of potentially important moderators of the stress and health behavior pathways to identify the conditions under which these pathways are enhanced or ameliorated. It could be argued, for example, that the stress pathway from perfectionism to health is enhanced when individuals perceive that they are not meeting their

excessively high standards or, in other words, are high in perfectionistic discrepancy (Slaney, Rice, Mobley, Trippi, & Ashby, 2001).

A significant limitation plaguing this field is researchers' reliance on singular and self-reported measures of health. Whereas self-reported measures of health, such as perceived health, are certainly important to capture health outcomes prospectively predicting morbidity and mortality (Guimaraes et al., 2012), they are not sufficient to address the complex associations among perfectionism, stress, health behaviors, and health. Consequently, we encourage researchers to conduct multi-method and multi-informant studies that better reflect biopsychosocial models of health (e.g., Engel, 1977; Suls & Rothman, 2004). It is our hope that research in this area will also continue the important trend of establishing that health costs associated with perfectionism are not simply a byproduct of individual differences in broader personality constructs such as higher levels of neuroticism or lower levels of conscientiousness and optimism. We believe that there are particular health risks that accompany extreme perfectionism, and this is a unique vulnerability that is distinguishable from the health risks and associated factors that are central to these other personality styles. Once the unique health risks associated with perfectionism are more fully documented, it will be important to develop a research agenda that focuses on developing and implementing a preventive approach that jointly aims at reducing perfectionistic strivings and concerns and bolstering levels of resilience among at-risk perfectionists who may profit from striving for excellence rather than perfection.

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