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Running Head: PERFECTIONISM AND PHYSICAL HEALTH

Does Perfecting Your Day Keep the Doctor Away?: Examining the Roles of Affect and Coping in the Association Between Perfectionism and Physical Health

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Abstract

This study proposed a structural model in which the association between perfectionism and physical health is mediated by positive and negative affect and coping strategies. A sample of 119 Illinois Wesleyan undergraduate students completed questionnaires that assessed perfectionism, affect, coping strategies, physical health, and preventative and risky health behaviors. Results offer partial support for the proposed model and include the following: maladaptive perfectionism is related to the experience of more physical health symptoms, and this relation is mediated by negative affect and maladaptive coping. Adaptive perfectionism is related to the performance of more preventative health behaviors, mediated by positive affect; and maladaptive coping is related to fewer physician visits, mediated by adaptive coping. Implications for understanding the relation between perfectionism and physical health and for improving the health of individuals are discussed.

Perfectionism and Physical Health: A Proposed Model Mediated by Affect and Coping

“Aim at perfection in everything, though in most things it is unattainable. However, they who aim at it, and persevere, will come much nearer to it than those whose laziness and despondency make them give it up as unattainable.” –Lord Chesterfield (British Statesman)

“Perfectionism is slow death.” –Hugh Prather (American best selling author)

Traditionally viewed as a unidimensional personality construct, perfectionism has historically been portrayed in very different lights. On one hand, like Lord Chesterfield describes, it is seen as a goal with positive outcomes for which one should strive. On the contrary, it has often been portrayed in a very negative fashion, as Hugh Prather indicates by associating it with a “slow death.” These conflicting points of view can be explained when perfectionism is viewed as a multidimensional construct with both adaptive and maladaptive components. Adaptive perfectionists are depicted as individuals who are engaged in the relaxed and careful pursuit of activities that are evaluated in light of high but reasonable self-standards. In contrast, maladaptive perfectionists are described as individuals who are immersed in the tense and deliberate pursuit of unreasonable expectations (Rice & Lapsley, 2001). Recently, researchers have developed scales that assess the distinct dimensions of perfectionism encompassing its adaptive and maladaptive aspects, including Hewitt and Flett’s (1991) Multidimensional Perfectionism scale (MPS-H) and Frost, Marten, Lahart, and Rosenblate’s (1990) Frost Multidimensional Perfectionism Scale (FMPS). These scales have been useful for exploring the various types of perfectionism and their implications for the health of individuals possessing their traits. The present study aims to utilize these scales to

contribute to the existing body of research concerning perfectionism and health by exploring perfectionism's relation to physical health and the constructs that mediate it, namely positive affect, negative affect, and coping. Before delving into the details of the study however, the MPS-H and the FMPS will be described in greater detail in the following section.

Perfectionism: Definition and Measurement

In general, both the MPS-H and the FMPS distinguish between adaptive perfectionism and maladaptive perfectionism. However, these scales use differing terms to identify these two main dimensions of perfectionism.

Synonymous with adaptive perfectionism, the MPS-H uses the term *self-oriented* perfectionism and characterizes it as the personal setting and seeking of high self-standards of performance (Hewitt & Flett, 1991). Similarly, the FMPS references adaptive perfectionism with its *personal standards* construct, which is correspondingly conceptualized as the setting of high standards and the excessive importance placed on these high standards for self-evaluation (Frost, Marten, Lahart, & Rosenblate, 1990). Previous research has shown that these constructs are associated with high positive affect, low negative affect, active coping style, and psychological wellbeing (Flett, Hewitt, Blankenstein, & Dynin, 1994; Molnar, Reker, Culp, Sadava, & DeCourville, 2006; Rice & Lapsley, 2001). Therefore, for the sake of this literature review, the terms *adaptive perfectionism*, *self-oriented perfectionism*, and *personal standards perfectionism* will represent the adaptive dimension of perfectionism and may be used interchangeably.

The maladaptive components of perfectionism are represented within the MPS-H as *socially prescribed* perfectionism, which is characterized by individuals' perceptions

that significant others place exceptionally high standards on them and evaluate them stringently (Hewitt & Flett, 1991). Alternatively, the FMPS uses the constructs *concern over mistakes* and *doubts over actions* to refer to maladaptive perfectionism (Frost et al., 1990). All three of these components of maladaptive perfectionism are related to low positive affect, high negative affect, avoidant coping style, and psychological distress (Molnar et al., 2006; O'Connor & O'Connor, 2003; Wei, Heppner, Russell, & Young, 2006;). Accordingly, the terms maladaptive perfectionism, socially prescribed perfectionism, concern over mistakes, and doubts over actions may be mentioned interchangeably throughout this literature review.

Although the associations just mentioned between mental health and both dimensions of perfectionism have been investigated in many studies, little attention has been given to perfectionism's relation to physical health. This is surprising given perfectionism's well-documented associations with affect, stress, coping style, and psychological wellbeing, which have all been linked to physical health (Cohen et al., 1995; Diefenbach, Levanthal, Levanthal, & Patrick-Miller, 1996; Folkman, 1997; Khosla, 2006; Pettit et al., 2001; Salovey, Rothman, Detweiler, & Steward, 2000; Watson, 1988). Clearly, it is plausible that perfectionism plays a direct and indirect role in predicting physical health and additional research is needed to investigate these potential links. Hence, the current study proposes a model in which perfectionism and physical health are both directly associated with one another and also indirectly linked through affect and coping style. The design of the study and the newly proposed model will be discussed in greater depth, but first the existing literature concerning the various

links among perfectionism, affect, coping style, psychological wellbeing, and physical health will be examined in the following sections.

Perfectionism and Affect

According to the bivariate model of affect, positive and negative affect are separate constructs, as compared to one unidimensional construct, that include different emotions. Positive affect reflects the extent to which an individual is enthusiastic, alert, and active, while negative affect is a general dimension of subjective distress (Khosla, 2006).

Previous research has demonstrated that positive and negative affect are distinctly related to the adaptive and maladaptive dimensions of perfectionism (Dunkley, Zuroff, & Blankenstein, 2003). More specifically, Molnar et al. (2006) found that self-oriented perfectionism was positively associated with positive affect and inversely associated with negative affect. These associations may be explained by the notion that although adaptive perfectionists set high standards for themselves, they rely on effective coping strategies and social support to reach their goals, resulting in self-satisfaction, increased positive affect, and decreased negative affect (Dunkley et al., 2003).

In contrast, studies have found that socially prescribed perfectionism is positively correlated with negative affect and inversely related to positive affect (Hewitt & Flett, 1991; Molnar et al., 2006). These findings are consistent with the idea that maladaptive perfectionism involves constant and harsh self-scrutiny, overly critical evaluations of one's behavior, and poor coping strategies, which collectively lead to decreased positive affect and increased negative affect (Dunkley et al., 2003).

Overall, the empirical evidence supports distinctive associations between positive and negative affect and adaptive and maladaptive perfectionism, suggesting that affect may play an important part in explaining the links between perfectionism and health. In addition to these associations, maladaptive and adaptive perfectionism have also been shown to have unique relations to the different coping styles that individuals possess for dealing with stress. This supports the explanatory role of coping in perfectionism's relation with health, and the most relevant literature in this area will now be reviewed.

Perfectionism and Coping Style

Maladaptive and adaptive perfectionism have been shown to have different associations with both stress and coping style. With regard to stress, many studies have found that socially prescribed perfectionism is related to increased stress levels while self-oriented perfectionism is not (Chang, 2006; Chang, Watkins, & Banks, 2004). Furthermore, evidence suggests that adaptive and maladaptive perfectionists tend to engage in different coping strategies in response to stress. Specifically, studies have found that adaptive perfectionists tend to engage in active, problem-focused coping, which involves identifying the problem that is causing the stress and actively working to solve it. Conversely, maladaptive perfectionists tend to respond to stressful situations with a helplessness orientation and engage in avoidant coping strategies such as denial or using substances to distract themselves from the problem (Dunkley, Blankstein, Halsall, Williams, & Winkworth, 2000; Dweck & Sorich, 1999).

In other words, adaptive perfectionists may experience lower levels of stress because they are able to engage in effective coping strategies to offset stressors and move toward their goals. On the contrary, maladaptive perfectionists experience low levels of

perceived self-efficacy, the expectation of criticism, and self-blame, which all contribute to dysfunctional coping strategies such as disengagement and denial and result in increased levels of stress (Frost, Turcotte, Heimberg, Mattia, Holt, & Hope, 1995; Hewitt & Flett, 1991; Martin, Flett, Hewitt, Krames, & Szanto, 1996). If this is the case, it logically follows that the different coping styles and stress levels of adaptive and maladaptive perfectionists may differentially affect physical health outcomes.

Affect and Coping Style

In addition to the relations between perfectionism and affect and perfectionism and coping style, previous research suggests that coping style and affect are associated with one another. More specifically, adaptive coping strategies, namely problem-focused coping, which involves thinking and behaving in ways that allow individuals to attack the underlying cause of their stress, and positive reappraisal, which involves focusing on the positive rather than the negative aspects of a situation, can generate positive affect (Khosla, 2006). This explains why adaptive perfectionists, who tend to engage in problem-focused coping strategies, experience higher levels of positive affect, while maladaptive perfectionists, who fail to engage in these coping strategies, experience lower levels of positive affect.

Further, Dunkley, Zuroff, and Blankstein (2003) found a positive relationship between avoidant coping and negative affect mediated by hassles and stress. Again this explains the higher levels of negative affect in maladaptive perfectionists who tend to engage in avoidant coping and lower levels of negative affect in adaptive perfectionists who utilize more effective coping strategies.

In addition, there is evidence that positive affect facilitates adaptive coping and adjustment to stress (Folkman, 1997). This may occur because of positive affect's ability to help individuals process emotional information accurately and efficiently, solve problems, and achieve goals in their lives (Khosla, 2006). Furthermore, positive affect has been shown to produce patterns of thought that are flexible, creative, integrative, open to information, and efficient, which might broaden one's array of coping options when faced with a stressful situation (Isen, 1999). In support of this notion, a study by Khosla and Hangal (2004) found that participants experiencing high levels of positive affect reported having more total coping resources to deal with stress and reported using more problem focused coping strategies than those who possessed low levels of positive affect.

In summary, there appears to be a reciprocal link between affect and coping style; positive affect leads to effective coping strategies while adaptive coping processes help to generate and sustain positive affect. These two constructs interact with one another, but they are also individually associated with perfectionism, as noted before. The reciprocal relation between these constructs may be important for explaining perfectionism's association with physical health. Before discussing this concept in detail, however, the next section will examine another important area of research that helps explain perfectionism's relation with physical health: perfectionism and psychological wellbeing.

Perfectionism and Psychological Wellbeing

There is a large body of research suggesting a link between perfectionism and psychological wellbeing. Recent studies suggest that maladaptive perfectionism is related to poor psychological functioning while adaptive perfectionism is actually related to

increased mental health. For example, maladaptive perfectionism has been linked with various forms of psychopathology and mental health concerns such as depression, anxiety, phobias, panic disorders, eating disorders, obsessive-compulsive disorder, somatic complaints, and suicidal ideation (Shafran and Mansell, 2001). Conversely, adaptive perfectionism was found to predict psychological wellbeing, high self-esteem, and greater academic adjustment (Frost et al., 1993; Rice & Mirzadeh, 2000).

Additionally, Chang (2006) found that adaptive perfectionism was positively and significantly related to two dimensions of psychological well being, namely purpose in life and personal growth, supporting the notion that some aspects of perfectionism may actually be beneficial to mental health.

In contrast, Chang (2006) found that socially prescribed, or maladaptive, perfectionism was significantly and negatively associated with all six dimensions of psychological wellbeing, including self-acceptance, positive relations with others, autonomy, environmental mastery, purpose in life, and personal growth. This suggests that maladaptive perfectionism is not only linked to psychological dysfunction; it is also predictive of less positive psychological functioning.

In summary, a large body of research supports an association between perfectionism and psychological wellbeing. The profound need to avoid failure that is characteristic of maladaptive perfectionism may contribute to its positive association with psychological dysfunction and poor mental health, while the achievement striving and pursuit of success that characterizes adaptive perfectionism may explain its positive correlation with psychological wellbeing (Slate and Owens, 1998).

This association between perfectionism and psychological wellbeing helps provide an explanation for the distinct relations between adaptive and maladaptive perfectionism and physical health when psychological wellbeing's association with physical health is considered. To elaborate, higher levels of psychological wellbeing and positive affect are linked to better physical health while psychological dysfunction is related to poorer physical health. In support of this, one study found that dysfunctional psychological states such as depression and anxiety were related to altered immune processes and also to the development and course of coronary heart disease (Taylor, Kemeny, Reed, Bower, & Gruenewald, 2000). In another study, psychological wellness and positive affect were found to keep physiological and neuroendocrine responses to stress at low levels, contributing to better physical health (Taylor, Lerner, Sherman, Sage, & McDowell, 2003).

These findings regarding psychological wellbeing can help explain perfectionism's relation with physical health. Specifically, adaptive perfectionism is related to psychological wellbeing, which is associated with better physical health, while maladaptive perfectionism is linked to psychological dysfunction, which is related to poorer physical health. Contributing to this explanation, the next section will discuss previous research concerning the links between affect and psychological wellbeing and between coping and psychological wellbeing, which suggests that affect and coping also play important roles in explaining perfectionism's relation with physical health.

Affect, Coping Style, and Psychological Wellbeing

Affect and coping style have been shown to be directly associated with psychological wellbeing. In fact, affect has even been used as an indicator of

psychological wellbeing, as psychologically healthy individuals tend to have higher positive affect and lower negative affect while psychological distress is often characterized by higher negative affect and lower positive affect (Bradburn, 1969).

Furthermore, adaptive coping style is related to reduced hopelessness and better psychological functioning while the opposite is true of avoidant coping style (O'Connor & O'Connor, 2003). Many studies have also provided evidence that suggests coping style mediates the association between maladaptive perfectionism and both depression and psychological distress. That is, maladaptive perfectionism was related to higher levels of depression and more psychological distress when avoidant coping strategies were used than when problem-focused coping strategies were utilized (Dunkley and Blankstein, 2000; Dunn, Whelton, Sharpe, 2006; Wei, Heppner, Russell, and Young, 2006).

All in all, the past literature suggests important roles of affect and coping style in perfectionism's association with psychological wellbeing. These findings along with the previously discussed association between psychological wellbeing and physical health are valuable for further understanding the unique associations between adaptive and maladaptive perfectionism and physical health.

Affect, Coping Style, and Physical Health

In addition to the relation between psychological wellbeing and physical health, as well as the links among affect, coping style, and psychological adjustment, there is research that supports the direct roles of both affect and coping style in predicting physical health. First, high levels of negative affect have been related to poorer physical health. More specifically, studies have found that negative affect is positively related to health complaints and symptoms, such as headaches, backaches, and stomach problems,

as well as to increased vulnerability to illness (Cohen et al., 1995; Cohen & Rodriguez, 1995; Diefenbach, Leventhal, Levanthal, & Patrick-Miller, 1996).

Positive affect, on the other hand, has been shown to be significantly and positively related to health (Pettit et al., 2001; Salovey, Rothman, Detweiler, & Steward, 2000; Watson, 1988). Contributing to the explanation of this association is the finding that positive affect helps individuals recover from cardiovascular arousal, which puts strain on the heart. This recovery functionality may aid in preventing the negative health effects of stress, including increased vulnerability to certain health problems such as infectious diseases, endocrine diseases, respiratory infections, and cardiac problems (Fredrickson, 2001; Fredrickson & Levenson, 1998).

The damaging effects of high reactivity to stress also help to explain the relation between coping style and physical health. Individuals who engage in adaptive coping methods, such as positive reappraisal and active coping, will be more successful in controlling their stress levels, thus reducing the negative consequences of stress on physical health. Conversely, engaging in maladaptive or avoidant coping methods such as alcohol use or mental withdrawal may prolong the experience of stress, resulting in negative health outcomes (Folkman, 1997). For example, one study found that avoidance coping was associated with lower numbers of T cells and reduced NK cytotoxicity among law school students (Segerstrom, Taylor, Kemeny, & Fahey, 1998).

To conclude, active and avoidant coping styles along with positive and negative affect are distinctively related to physical health. In addition, two separate trends have emerged through the various relations among perfectionism, coping style, affect, physical wellbeing, and physical health. First, adaptive perfectionism is related to positive affect,

adaptive coping strategies, and psychological wellbeing, which are all associated with better physical health. On the contrary, maladaptive perfectionism is related to negative affect, maladaptive coping strategies, and psychological distress, which are all related to poorer physical health.

Given these relationships, it is surprising that very few studies have examined the direct association between perfectionism and physical health and the factors that may mediate this association. Despite a lack of research in this area, the following section will discuss some studies that have provided evidence for a direct and significant link between perfectionism and various measures of physical health.

Perfectionism and Physical Health

The few studies that have been conducted on the association between perfectionism and physical health suggest that there is a significant relationship between the two constructs, but some of the findings are conflicting due to different conceptualizations of perfectionism. Early research, which conceptualized perfectionism as a unidimensional construct, found that perfectionism was positively related to various disorders such as irritable bowel syndrome, erectile dysfunction, abdominal pain in children, and ulcerative colitis (Pacht, 1984). Similar studies also found perfectionism to be positively associated with an array of somatic problems, such as migraines (Burns, 1980; Kowal and Pritchard, 1990), chronic pain (Van Houdenhove, 1986), other types of headaches (Stout, 1984), and asthma (Morris, 1961).

However, more recent studies that conceptualize perfectionism as a multidimensional construct have found unique associations between the two dimensions of perfectionism and physical health. The majority of past research suggests that

maladaptive perfectionism is related to poorer physical health while adaptive perfectionism has no relation to physical health. White and Schweitzer (2000) found that two components of maladaptive perfectionism, namely concern over mistakes and doubts over action, were positively correlated with chronic fatigue syndrome, while adaptive perfectionism was not. Other studies have found that only maladaptive perfectionism was negatively related to physical health, as measured by psychosomatic complaints such as headaches, stomach aches, and fatigue, while again adaptive perfectionism was unrelated to these symptoms (Dunkley & Blankstein, 2000; Martin, Flett, Hewitt, Krames, & Szantos, 1996; Wyatt & Gilbert, 1998). Finally, Saboonchi and Lundh (2003) found that socially prescribed perfectionism was positively correlated with somatic complaints such as gastrointestinal problems, headaches, and nausea, while self-oriented perfectionism and somatic complaints were not related.

However, one study suggests that adaptive perfectionism may have a beneficial effect on physical health. Particularly, Molnar et al. (2006) tested a model of perfectionism and physical health with a sample of 492 young adults between the ages of 24 and 35 years. Physical health was conceptualized as self-reported perceived health, symptom frequency (including sleep problems, shortness of breath, upset stomach, pains and ailments, fatigue, and the extent to which ill health affected their daily functioning), and number of visits to a physician and number of days sick in bed over the past two years. They found that socially prescribed perfectionism was related to poorer health, while self-oriented perfectionism was actually associated with better physical health.

Given the conflicting findings concerning this area of research, the aim of the current study is to further explore the associations between perfectionism and physical

health, especially the emerging positive relation between adaptive perfectionism and better physical health. This study also attempts to explain these associations by identifying the underlying factors involved in these relationships, specifically positive and negative affect and coping style.

Affect and Coping Style as Mediators

As discussed earlier, research indicates unique and direct associations among adaptive and maladaptive perfectionism, positive and negative affect, and active and avoidant coping styles. Additionally, recent studies have provided evidence for a mediating role of affect in the relation between perfectionism and physical health. For example, Molnar et al. (2006) found that positive and negative affect mediated the relations between perfectionism and physical health. Specifically, their model suggests that socially prescribed perfectionism is related to higher levels of negative affect and lower levels of positive affect, which in turn, are associated with poorer physical health, while self-oriented perfectionism is related to lower levels of negative affect and higher levels of positive affect, which in turn, are associated with better physical health.

While the association between self-oriented perfectionism and physical health was fully mediated by affect in Molnar et al.'s (2006) model, the association between socially prescribed perfectionism and physical health was only partially mediated by affect. This suggests that there may be additional factors that help facilitate this association. One such factor that I hypothesize will help mediate the relation between perfectionism and physical health is coping style, as it has already been shown to mediate the relationship between perfectionism and psychological wellbeing. In particular, ineffective coping has been found to mediate the association between maladaptive

perfectionism and both depression (Wei, Heppner, Russell, & Young, 2006) and distress (Dunkley and Blankstein, 2000). Given coping style's link with perfectionism and psychological functioning's association with physical health, the current study will expand on Molnar et al.'s (2006) model by including coping style in addition to affect as a mediator in the association between perfectionism and physical health.

Conceptualization of Physical Health

One additional way that the current research will contribute to Molnar et al.'s (2006) model is by expanding on the conceptualization of physical health. As discussed earlier, Molnar et al. defined physical health based on four indicators that represent a person's *current* health, namely perceived health (how participants rated their overall physical health as compared to others of their same age), symptoms (such as sleep problems, shortness of breath, upset stomach, pains and ailments, and fatigue), and number of visits to a physician and days sick in bed over the past two years. In addition to this, I believe that an individual's health *behaviors*, both risky ones that are harmful to physical health and preventative ones that contribute to good health, are important to investigate in order to examine the association between perfectionism and long-term physical health.

Past research suggests that maladaptive perfectionism is related to engaging in more risky health behaviors and fewer preventative ones. For example, one study found that greater levels of socially prescribed perfectionism were related to fewer preventative health behaviors and more health risk behaviors (Chang et al., 2008). In addition, Ng and Jeffery (2003) found that high levels of perceived stress, which is characteristic of maladaptive perfectionists, were associated with a higher fat diet, exercising less, and

smoking more. Further, avoidance coping, linked to maladaptive perfectionism, is positively related to unhealthy behavior such as substance abuse (Wills & Hirky, 1996). Accordingly, the current model predicts that individuals high in maladaptive perfectionism will engage in fewer preventative behaviors, like exercising regularly, and more risky behaviors, like smoking cigarettes.

Although previous research has not found a direct association between adaptive perfectionism and either preventative or risky health behaviors, some studies suggest that perfectionism is related to both. For example, Martin et al. (1996) found that self-oriented perfectionism has a positive association with self-efficacy, which is important for predicting health behavior according to the Health Belief Model (Rosenstock, 1966). This suggests that adaptive perfectionism is positively related to performing preventative health behaviors. Additionally, research suggests that self-oriented perfectionists tend to have higher levels of self-control than socially prescribed perfectionists, supporting the prediction that adaptive perfectionism will be associated with fewer risky health behaviors such as smoking and drinking (Flett et al., 1991). Finally, active coping, which is linked to adaptive perfectionism, has been found to be associated with engaging in more preventative health behaviors such as treatment adherence (Christensen, Benotsch, Wiebe, & Lawton, 1995). In accordance with these findings, the current model predicts that individuals high in adaptive perfectionism will engage in fewer risky behaviors and more preventative behaviors.

The Current Study

The current study proposes a model that depicts the association between perfectionism and physical health and the mediating roles of affect and coping. This

model is illustrated in Figure 1. First, the model distinguishes between adaptive and maladaptive perfectionism, as Molnar et al.'s (2006) model does, predicting unique effects of these dimensions on physical health. Next, it is hypothesized that positive and negative affect will mediate these associations. Additionally, this model expands on Molnar et al.'s (2006) model by predicting that coping style will mediate these associations as well, both directly and through its relation to affect. Finally, in addition to measuring a person's current health status, the construct of physical health is expanded to measure health behaviors that may affect a person's future health. With this, the present study attempts not only to replicate previous findings of a positive link between maladaptive perfectionism and health risk behaviors and a negative link between maladaptive perfectionism and preventative health behaviors, but also to contribute to the existing literature by establishing two new direct associations (Chang, 2008). Specifically, a negative association between adaptive perfectionism and health risk behaviors is hypothesized, as well as a direct positive correlation between adaptive perfectionism and preventative health behaviors.

Overall, in accordance with previous findings, this study proposes two main hypotheses. Hypothesis 1 is that adaptive perfectionism will predict better physical health, including the performance of more preventative health behaviors and fewer health risk behaviors, and this relation will be mediated by positive affect and adaptive coping. Alternatively, Hypothesis 2 is that maladaptive perfectionism will predict poorer physical health, including the performance of fewer preventative health behaviors and more health risk behaviors, and this relation will be mediated by negative affect and maladaptive coping.

Method

Participants

A total of 119 Illinois Wesleyan students (76 women and 43 men) were recruited from general psychology courses to participate in the present study. Participants ranged in age from 18 to 22 years ($M = 19.0$). The ethnic makeup of the sample was 85 percent Caucasian, 10 percent Asian, 3 percent African American, and 2 percent other. Participants received one research credit for their time.

Procedure

Upon arrival at the lab, participants were greeted by an experimenter who invited them to take a seat in front of a computer. After welcoming the participants and quickly introducing the study, the experimenter obtained informed consent.

After informed consent was obtained, participants were then asked to follow the instructions on the computer screen and answer the presented questions using the mouse and keyboard. The participants then completed the questionnaires mentioned in the following section via MediaLab software. Each participant took approximately 15 minutes to complete the study and was thanked and debriefed prior to leaving.

Measures

Perfectionism. A shortened version of Hewitt and Flett's (1991) Multidimensional Perfectionism Scale (MPS-H) is one of two measures that was used to assess perfectionism. The shortened version of the MPS-H consists of 15 items, which are divided into three subscales of 5 items each that measure three different dimensions of perfectionism. The *self-oriented perfectionism* subscale measures the extent to which individuals place high standards on themselves (e.g., "One of my goals is to be perfect in

everything I do”). The *other-oriented perfectionism* subscale measures the extent to which an individual places high standards of achievement on significant others (e.g., “I have high expectations for the people who are close to me”). Last, the *socially prescribed perfectionism* subscale measures the extent to which people feel that high standards are being imposed on them by significant others (e.g., “The people around me expect me to succeed in everything I do”). Items were assessed using a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The shortened scale used in the current study was assessed and shows acceptable reliability ($\alpha = .73$). The participants’ final scores were obtained by calculating the mean of their responses overall and to the three subscales individually, such that higher scores indicate higher levels of perfectionism.

The other measure that was used to assess perfectionism is a shortened version of Frost’s (1990) Multidimensional Perfectionism Scale (FMPS). This scale measures six dimensions of perfectionism: Concern over Mistakes (CM), Personal Standards (PS), Parental Expectations (PE), Parental Criticism (PC), Doubting of Actions (DA), and Organization (O). Each dimension is assessed on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The shortened version of the FMPS used in the current study shows acceptable reliability ($\alpha = .86$). The participants’ final scores were obtained by calculating the mean of their responses overall and to the six subscales individually, such that higher scores indicate higher levels of perfectionism.

Affect. Positive and Negative affect were measured using The Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). This scale consists of 20 items, namely 10 positive emotions (e.g., alert, excited, and interested) and 10 negative emotions (e.g. distressed, guilty, and jittery) that participants rate according

to how much they generally (on average) experience them. Each emotion is rated on a 5-point Likert scale ranging from 1 (very slightly or not at all) to 5 (extremely). The current study found both the positive affect and negative affect subscales to have good reliability ($\alpha = .89$ and $\alpha = .88$). The participants' final scores were obtained by calculating the mean of their responses to the positive emotions, such that higher scores indicate higher positive affect, and the mean of their responses to the negative emotions, such that higher scores indicate higher negative affect.

Coping. The Coping Strategies Inventory (CSI; Tobin et al., 1989) along with the COPE scales (Carver, Scheier, & Weintraub, 1989) were used to assess the different ways that participants cope with stress.

A shortened version of the CSI was used in this study and consists of 16 items for which respondents are asked to rate the extent to which they generally utilize each listed coping strategy. Responses are assessed using a 5-point Likert scale ranging from 1 (not at all) to 5 (a great deal). The scale is subdivided into 8 primary subscales, including problem solving, cognitive restructuring, social support, express emotions, problem avoidance, wishful thinking, social withdrawal, and self-criticisms. For the current study, the items in the shortened version of the CSI were categorized as either adaptive (CSI-A) or maladaptive (CSI-M), and these subscales showed acceptable reliability ($\alpha = .72$ and $\alpha = .74$, respectively). The participants' final scores were obtained by calculating the means of their responses to the adaptive and maladaptive subscales individually, with a higher score indicating more reliance on that particular type of coping strategy.

The COPE scales consist of a total of 53 items for which participants indicate the frequency with which they perform each behavior to cope with stress using a 5-point

Likert scale ranging from 1 (never) to 5 (always). The subscales that collectively make up the COPE scales include active coping, planning, suppression of competing activities, restraint coping, seeking social support for instrumental reasons, seeking social support for emotional reasons, positive interpretation and growth, acceptance, turning to religion, focus on and venting of emotions, denial, behavioral disengagement, mental disengagement, and alcohol-drug disengagement. For the purposes of this study, the items in this scale were categorized as either adaptive (COPE-A) or maladaptive (COPE-M), and these subscales showed good reliability ($\alpha = .87$ and $\alpha = .84$, respectively). The participants' final scores were obtained by calculating the mean of their responses to each subscale individually, with a higher score indicating more reliance on that particular type of coping strategy.

Physical health. Current physical health was measured by three variables: perceived health, number of visits to a physician during the past two years, and symptoms. Perceived health was indicated by how participants rate their own overall physical health compared to others of the same age on a 4-point scale ranging from poor to excellent. Number of physician visits was reported by participants using a 7-point scale ranging from 0 to more than 15. Symptoms were assessed using a 17-item scale based on the Symptoms Questionnaire (SQ; Kellner, 1987). The scale showed good reliability ($\alpha = .87$). Participants rated the frequency with which they experience each symptom (e.g. difficulty sleeping, headache, nausea) using a 5-point Likert scale ranging from 1 (never) to 5 (always). The mean score was calculated with higher scores indicating more symptoms and therefore poorer health.

Preventative health behavior. Preventative health behavior was measured using a 20-item scale adapted from the General Preventative Health Behavior Checklist (Amir, 1987). The adapted scale shows acceptable reliability ($\alpha = .76$). Participants rated how often they perform each health behavior listed (e.g. avoid drinking and driving, exercise regularly) on a 5-point Likert scale ranging from 1 (never) to 5 (always). The participants' final scores were obtained by calculating the mean of their responses, such that higher scores indicate greater preventative health behavior.

Health risk behavior. Health risk behaviors were assessed using a 20-item scale adapted from the Youth Risk Behavior Survey (CDC, 2007). The adapted scale shows acceptable reliability ($\alpha = .79$). Participants rated the extent to which they agree or disagree with each statement regarding their behavior (e.g. I rarely wear a seatbelt while riding in a car) using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The participants' final scores were obtained by calculating the mean of their responses, with higher scores indicating greater health risk behavior.

Results

Data Preparation

To prepare the data for analysis, reverse scoring techniques were first applied to the MPS-H. Next, scales were divided into subscales where necessary as designated in the methods section. Each scale or subscale was then tested for reliability. Finally, mean and standard deviation were calculated for all study variables (Table 1).

Correlational Analyses

Descriptive statistics and zero-order bivariate correlations for all study variables are presented in Table 1. There were four significant correlations between the

perfectionism and affect measures. Specifically, personal standards and self-oriented perfectionism were positively correlated with positive affect ($r = .38$ and $r = .31$), while concern over mistakes and doubts about actions were positively correlated with negative affect ($r = .30$ and $r = .45$).

There were ten significant correlations between the measures of perfectionism and coping style. First, concern over mistakes was positively correlated with both measures of adaptive coping ($r = .26$ and $r = .28$) and both measures of maladaptive coping ($r = .20$ and $r = .43$). Next, doubts about actions was positively correlated with one measure of adaptive coping (CSI-A; $r = .23$) and both measures of maladaptive coping ($r = .31$ and $r = .42$). Third, socially prescribed perfectionism was positively correlated with both measures of maladaptive coping ($r = .19$ and $r = .33$) but unrelated to adaptive coping. Finally, personal standards was positively correlated with one measure of adaptive coping (COPE-A; $r = .28$) and unrelated to maladaptive coping.

There were three significant correlations between the measures of affect and coping style. Positive affect was positively correlated with adaptive coping (COPE-A; $r = .22$), and negative affect was positively correlated with both measures of maladaptive coping ($r = .37$ and $r = .56$). Finally, there were five significant correlations between the measures of perfectionism and physical health. Specifically, concern over mistakes and doubts about actions were both negatively correlated with symptoms (smaller values reflect the experience of more symptoms; $r = -.20$ and $r = -.36$) and physician visits ($r = -.22$ and $r = -.25$), and self-oriented perfectionism was negatively correlated with preventative health behaviors (lower scores indicate greater preventative health behavior, $r = -.23$).

Mediational Analyses: Hypothesis Testing

Linear regressions were performed to examine mediation effects. Mediation is demonstrated when the following conditions are met: (1) the independent variable (i.e. type of perfectionism) predicts the dependent variable (i.e. health outcome); (2) the mediator(s) (i.e. coping style or affect) predict the dependent variable and; (3) full mediation is confirmed when the association between the independent and dependent variable is reduced to non-significance when the effect of the mediator is controlled for (Kenny, Kashy, & Bolger, 1998). Partial mediation is indicated when the significance of the association between the independent and dependent variable is reduced, but the association is still significant. Tests of mediation were conducted when an independent and dependent variable were correlated. Affect and coping style were tested as mediators for pairs of variables that met this criterion.

Self-oriented Perfectionism and Preventative Health Behaviors

Recall Hypothesis 1 stated that adaptive perfectionism would predict better physical health, including more preventative health behaviors and fewer health risk behaviors, and this relation would be mediated by positive affect and adaptive coping. In order to test this hypothesis, a test of mediation was conducted on the correlated variables self-oriented perfectionism (which reflects adaptive perfectionism) and preventative health behaviors. Linear regression analysis showed that self-oriented perfectionism significantly predicted preventative health behaviors indicating that condition 1 for mediation was met ($\beta = .23, p = .01$). Next, linear regression analysis indicated that positive affect significantly predicted preventative health behaviors ($\beta = .18, p = .04$), while negative affect and all four measures of coping (COPE-A, COPE-M, CSI-A, and

CSI-M) did not ($\beta = -.13; \beta = .04; \beta = -.05; \beta = .1; \beta = -.09; p's > .05$). Linear regression analysis then showed that the association between self-oriented perfectionism and preventative health behaviors was reduced to non-significance when the effect of positive affect was controlled for ($\beta = .18, p = .06$) indicating full mediation.

Concern over Mistakes and Symptoms

Recall Hypothesis 2 stated that maladaptive perfectionism would predict poorer physical health, and this relation would be mediated by negative affect and maladaptive coping. In order to test this hypothesis, a test of mediation was conducted on the correlated variables concern over mistakes (which reflects maladaptive perfectionism) and symptoms (which reflects poorer physical health). Linear regression analysis showed that concern over mistakes significantly predicted symptoms indicating that condition 1 for mediation was met ($\beta = .20, p = .03$). Next, linear regression analysis indicated that negative affect and one measure of maladaptive coping (CSI-M) significantly predicted symptoms ($\beta = .37, p = .00$ and $\beta = .30, p = .00$, respectively), while positive affect and the other three measures of coping (COPE-A, COPE-M, and CSI-A) did not ($\beta = .01; \beta = .05; \beta = -.18; p's > .05$). Linear regression analysis then showed that the association between concern over mistakes and symptoms was reduced to non-significance when the effect of negative affect was controlled for ($\beta = .10, p = .29$) and when the effect of maladaptive coping (CSI-M) was controlled for ($\beta = .07, p = .50$) indicating that each of these variables is a full mediator. Finally, the significance of the association between concern over mistakes and symptoms was diminished even further when negative affect and maladaptive coping (CSI-M) were controlled for simultaneously ($\beta = .05, p = .62$), indicating that these two variables have a greater mediational effect when taken together.

Doubts about Actions and Symptoms

Again examining hypothesis 2, a test of mediation was conducted on the correlated variables doubts about actions (which reflects maladaptive perfectionism) and symptoms (which reflects poorer physical health). Linear regression analysis showed that doubts about actions significantly predicted symptoms indicating that condition 1 for mediation was met ($\beta = .36, p = .00$). Next, linear regression analysis indicated that negative affect and one measure of maladaptive coping (CSI-M) significantly predicted symptoms ($\beta = .37, p = .00$ and $\beta = .30, p = .00$, respectively), while positive affect and the other three measures of coping (COPE-A, COPE-M, and CSI-A) did not ($\beta = .01$; $\beta = .05$; $\beta = -.18$; p 's $> .05$). Linear regression analysis then showed that the significance of the association between doubts about actions and symptoms was diminished when the effect of negative affect was controlled for ($\beta = .24, p = .01$) and when the effect of maladaptive coping (CSI-M) was controlled for ($\beta = .26, p = .02$) indicating that each of these variables is a partial mediator. Finally, the significance of the association between doubts about actions and symptoms was diminished even further when negative affect and maladaptive coping (CSI-M) were controlled for simultaneously ($\beta = .21, p = .03$), indicating that these two variables have a greater, yet still partial, mediational effect when taken together.

Concern over Mistakes and Physician Visits

Although not fitting with either hypothesis, a test of mediation was conducted on the correlated variables concern over mistakes (which reflects maladaptive perfectionism) and fewer physician visits (which reflects better physical health). Linear regression analysis showed that concern over mistakes significantly predicted fewer physician visits

indicating that condition 1 for mediation was met ($\beta = -.22, p = .02$). Next, linear regression analysis indicated that one measure of adaptive coping (CSI-A) significantly predicted fewer physician visits ($\beta = -.79, p = .00$), while positive and negative affect and the other three measures of coping (COPE-A, COPE-M, and CSI-M) did not ($\beta = -.02; \beta = -.02; \beta = -.06; \beta = -.01; \beta = -.02; p's > .05$). Linear regression analysis then showed that the association between concern over mistakes and fewer physician visits was reduced to non-significance when the effect of adaptive coping (CSI-A) was controlled for ($\beta = .01, p = .82$) indicating full mediation.

Doubts about Actions and Physician Visits

Similarly, despite not fitting with either hypothesis, a test of mediation was conducted on the correlated variables doubts about actions (which reflects maladaptive perfectionism) and fewer physician visits (which reflects better physical health). Linear regression analysis showed that doubts about actions significantly predicted fewer physician visits indicating that condition 1 for mediation was met ($\beta = -.25, p = .01$). Next, linear regression analysis indicated that one measure of adaptive coping (CSI-A) significantly predicted fewer physician visits ($\beta = -.79, p = .00$), while positive and negative affect and the other three measures of coping (COPE-A, COPE-M, and CSI-M) did not ($\beta = -.02; \beta = -.02; \beta = -.06; \beta = -.01; \beta = -.02; p's > .05$). Linear regression analysis then showed that the association between doubts about actions and fewer physician visits was reduced to non-significance when the effect of adaptive coping (CSI-A) was controlled for ($\beta = -.06, p = .29$) indicating full mediation.

Discussion

To summarize, the purpose of this study was to examine the association between

perfectionism and physical health, proposing a model in which this relation is mediated by affect and coping style. Two main findings emerged that lend partial support to the proposed model.

First, as hypothesized, adaptive perfectionism was associated with the performance of more preventative health behaviors, and this relation was fully mediated by positive affect (see Figure 2). Though this study is the first to find a relation between perfectionism and preventative health behaviors, this finding is in line with previous research that has found positive affect to be a mediator in the association between adaptive perfectionism and physical health (Molnar et al., 2006). Further, this finding is in agreement with previous studies that have found an association between perfectionism and positive affect and with studies that support a relation between positive affect and preventative health behaviors (Dunkley, Zuroff, & Blankenstein, 2003; Kelsey et al., 2006). The finding that adaptive perfectionism is related to the performance of more preventative health behaviors can further be explained by the idea that many preventative health behaviors involve setting and achieving goals, such as striving to reach a particular physical fitness level through exercise or attempting to achieve a weight goal by eating healthy. In addition, adaptive perfectionism is related to greater self-efficacy, which is important for the successful performance of many health behaviors (Martin et al., 1996). Although this finding does not support the hypothesis that adaptive perfectionism would be related to greater immediate health and/or fewer health risk behaviors or the hypothesis that adaptive coping strategies would be a mediator in these relations, it does lend support to many previous studies that found no relation between adaptive perfectionism and immediate physical health (White & Schweitzer, 2000; Dunkley &

Blankstein, 2000; Martin, Flett, Hewitt, Krames, & Szantos, 1996; Wyatt & Gilbert, 1998).

Second, as hypothesized, maladaptive perfectionism predicted the experience of more physical symptoms, and this relation was mediated by both negative affect and maladaptive coping (see Figure 3). This finding was robust; it was replicated using two distinct measures of maladaptive perfectionism, namely concern over mistakes and doubts about actions, with the former's relation to symptoms being fully mediated by both negative affect and maladaptive coping and the latter's relation to symptoms being partially mediated by these two variables. In addition, the mediational effect of negative affect and maladaptive coping in both relations was greater when they were considered together rather than individually, supporting the hypothesized association between these two variables and their subsequent effect on the relation between perfectionism and physical health. Although maladaptive perfectionism was not related to preventative and/or risky health behaviors as expected, its relation to symptoms supports previous research that found a significant association between maladaptive perfectionism and immediate physical health (White & Schweitzer, 2000; Dunkley & Blankstein, 2000; Martin, Flett, Hewitt, Krames, & Szantos, 1996; Wyatt & Gilbert, 1998). This finding is also in agreement with previous research that has found negative affect to be a mediator in the association between maladaptive perfectionism and physical health (Molnar et al., 2006). In addition, the present study is the first to find that maladaptive coping is a mediator in the relation between maladaptive perfectionism and physical health and that negative affect and maladaptive coping interact to have an even greater effect on this association.

Finally, an unexpected finding that actually refutes the proposed model was found and is worth noting. Maladaptive perfectionism predicted fewer visits to a physician and this relation was fully mediated by *adaptive* coping (see Figure 4). Although this finding is in line with the hypothesis that adaptive coping would be related to fewer visits to a physician, it directly opposes the prediction that maladaptive perfectionism would be negatively correlated with these two variables. This unexpected finding may have occurred because maladaptive perfectionism is positively correlated with both adaptive and maladaptive coping strategies. These correlations reflect the greater levels of stress that maladaptive perfectionists perceive, and their subsequent need to utilize every coping strategy available to them in their attempt to alleviate it (Chang, 2006). However, it seems that the maladaptive coping strategies have a greater influence on health, as indicated by the finding that maladaptive perfectionism is related to increased physical symptoms and that this relation is mediated by maladaptive coping. Even though reporting fewer visits to a physician was meant to signify better health, it may actually reflect a reluctance to show “imperfection” through admitting illness by going to a doctor when symptoms are experienced.

Limitations

Although several significant findings emerged from this study, it is not without limitations. First, all data were obtained through self-report questionnaires. As a result, participants’ responses may have been biased due to factors such as social desirability. This concern is amplified by the notion that perfectionists feel the need to be perfect, so their responses may be especially biased. Second, the design of the current study is cross-sectional. Consequently, the direction of observed associations can not be inferred. For

example, it cannot be concluded that perfectionism definitely precedes physical health, as differences in physical health could possibly cause the onset of either adaptive or maladaptive perfectionism. Further, although this study used preventative and risky health behaviors to tentatively predict the future health of participants, longitudinal studies would be able to more reliably predict the association between perfectionism and long-term health. Finally, the sample used in this study was limited to general psychology students from Illinois Wesleyan University, and is therefore very limited in its generalizability. Future studies should include a greater variety of participants with a wider range of ethnicities, ages, and locations.

Implications

Despite these limitations, this study has many implications for physical health. In addition to enhancing our understanding of the theoretical associations among perfectionism, affect, coping style, and physical health, the present findings support the usefulness of a number of practical health-related interventions. For instance, attempts to improve the physical health of individuals high in maladaptive perfectionism should avoid relying solely on decreasing undesirable characteristics directly related to maladaptive perfectionism and instead focus on decreasing negative affect and maladaptive coping as well. Similarly, it may be useful for interventions meant to increase preventative health behaviors to focus on increasing qualities related to adaptive perfectionism such as positive affect, self-efficacy, and goal-setting to maximize their effectiveness.

These results also have implications for specific populations. For example, perfectionism is linked to eating disorders such as anorexia and bulimia, and the health of

individuals living with these disorders often suffers as a result (Hewitt, Flett, & Ediger, 1995). Therefore, maintaining good physical health and performing preventative health behaviors in moderation is especially important among these perfectionistic individuals. Another group of people that may benefit from this study is the college student population. College is a time of increased stress as students learn to live away from home while enduring vigorous academic demands. This stress may be exacerbated in students high in maladaptive perfectionism. Accordingly, it would be beneficial for colleges and universities to promote better health and health behaviors through education about perfectionism, affect, and coping.

Future Research

Finally, the results of this study demonstrate a need for future research relating to perfectionism and physical health. First, they warrant the need for more research focusing on the association between adaptive perfectionism and physical health to help further resolve the conflicting results of various studies including the present one. That is, while Molnar et al. (2006) found that adaptive perfectionism was related to better physical health, this study along with many others found no relation between the two constructs. In addition, more research is definitely needed on the association between adaptive perfectionism and preventative health behavior. For instance, future studies may want to look at different preventative health behaviors individually to see which ones have the greatest associations with perfectionism.

Also, additional variables such as perceived stress could be explored as possible mediators that further explain the relation between perfectionism and physical health. Because of its link with maladaptive coping, the perception of increased stress may help

mediate the association between maladaptive perfectionism and physical health. This would be especially relevant for the association between doubts about actions and symptoms, as this relation was only partially mediated by negative affect and maladaptive coping. Therefore, it is plausible that other variables, like stress, may help mediate this association more fully.

Conclusion

To conclude, the results of the current study not only support previous research on perfectionism and physical health but also provide a number of unique contributions to the existing literature. Specifically, I found that maladaptive and adaptive perfectionism are related to physical health in a variety of different ways, both directly and indirectly through the mediating effects of affect and coping strategies. The results of this study offer both theoretical and practical implications for understanding and harnessing the relation between perfectionism and physical health.

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Figure 1. Proposed model of perfectionism and physical health

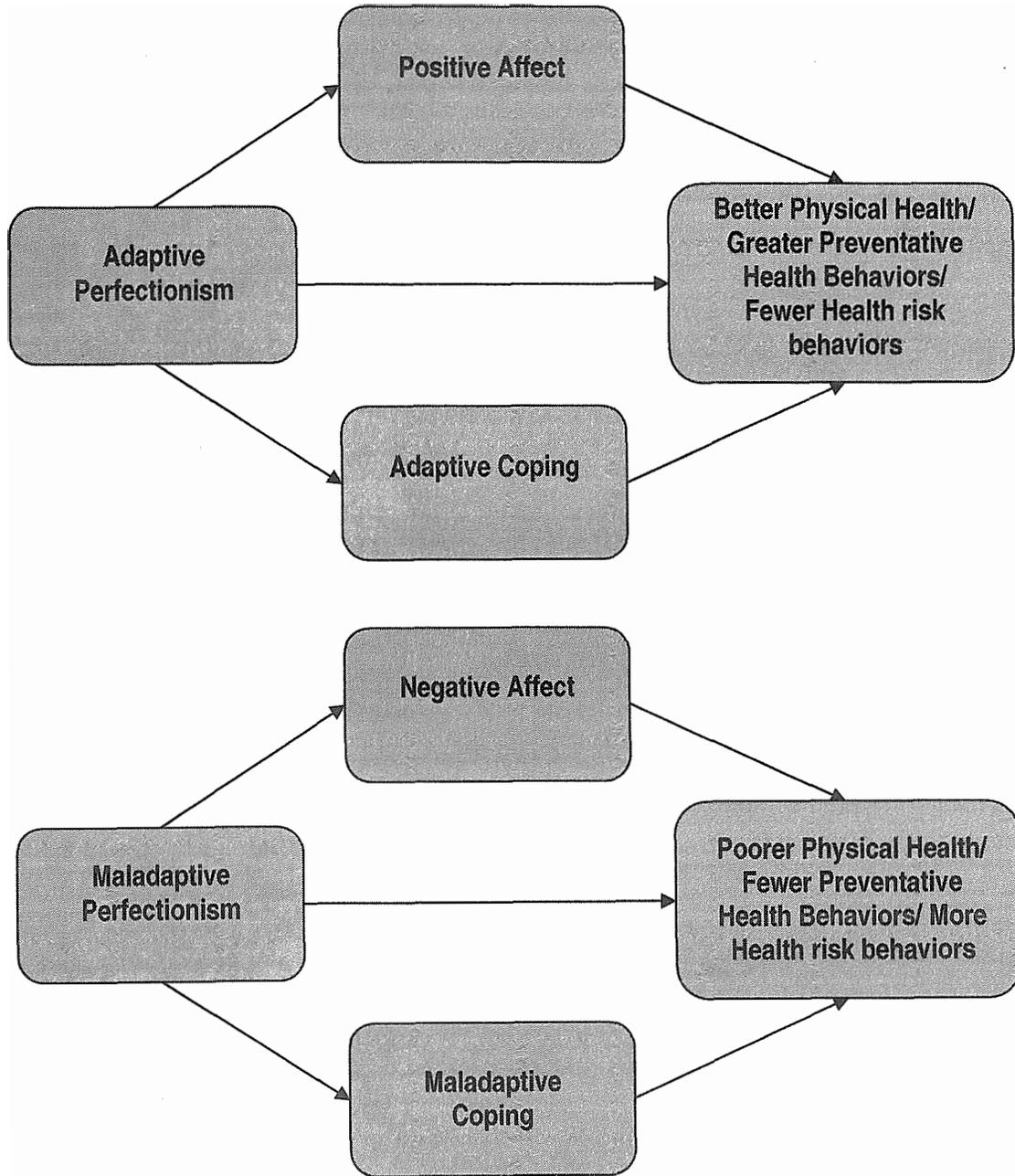


Table 1. Zero-order correlation coefficients, means, and standards deviations for main study variables for total sample (N=119)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. FMPS-COM	---															
2. FMPS-PS	.40*	---														
3. FMPS-DAA	.57*	.17	---													
4. MPS-SO	.36*	.53*	.14	---												
5. MPS-SP	.45*	.39*	.28*	.30*	---											
6. PA	-.04	.38*	-.14	.31*	.10	---										
7. NA	.30*	.07	.45*	.01	.13	-.26*	---									
8. COPE-A	.26*	.28*	.15	.15	.16	.22*	.00	---								
9. COPE-M	.20*	-.11	.31*	-.06	.19*	-.16	.37*	.33*	---							
10. CSI-A	.28*	.14	.23*	.05	.06	.17	.01	.73*	.27*	---						
11. CSI-M	.43*	.12	.42*	.11	.33*	-.18	.56*	-.14	.34*	-.16	---					
12. PHB	-.04	.13	-.08	.23*	.02	.22*	-.18*	.11	-.04	.13	-.13	---				
13. HRB	.08	.00	-.07	.05	.02	-.07	.10	-.23*	-.06	-.49*	.14	-.28*	---			
14. Symptoms	.20*	.00	.36*	.12	.09	-.11	.38*	-.15	.10	-.21*	.34*	-.24*	.24*	---		
15. OH	-.05	.17	-.13	-.02	.07	.09	-.19*	-.04	-.09	-.02	.07	.24*	-.06	-.15	---	
16. PV	-.22*	-.11	-.25*	.07	-.03	-.02	-.02	-.64*	-.25*	-.84*	.11	.02	.47*	.17	.07	---
Mean	3.61	2.58	2.64	3.87	3.21	3.39	2.40	2.65	2.03	2.37	2.74	2.60	1.38	1.36	0.33	0.47
SD	0.64	0.68	0.75	.49	0.53	0.77	0.79	0.54	0.38	1.61	1.07	0.47	0.33	0.60	0.88	1.42

Note: FMPS-COM, concern over mistakes; FMPS-PS, personal standards; FMPS-DAA, doubts about actions; MPS-SO, self-oriented perfectionism; MPS-SP, socially prescribed perfectionism; PA, positive affect; NA, negative affect; COPE-A, adaptive coping; COPE-M, maladaptive coping; CSI-A, adaptive coping; CSI-M, maladaptive coping; PHB, preventative health behaviors; HRB, health risk behaviors; OH, overall health; PV, physician visits.

* $p < 0.05$.

Figure 2. Adaptive perfectionism predicts the performance of more preventative health behaviors, and this relation is fully mediated by positive affect

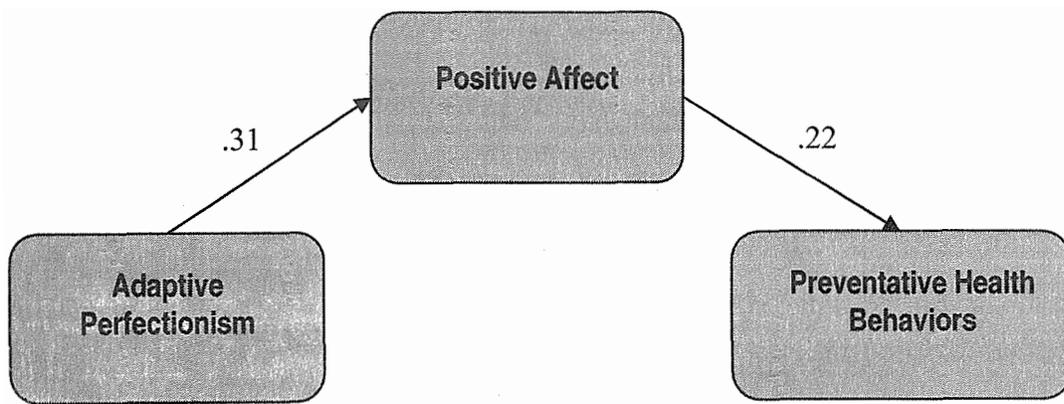


Figure 3. Maladaptive perfectionism predicts the experience of more physical symptoms, and this relation is mediated by negative affect and maladaptive coping

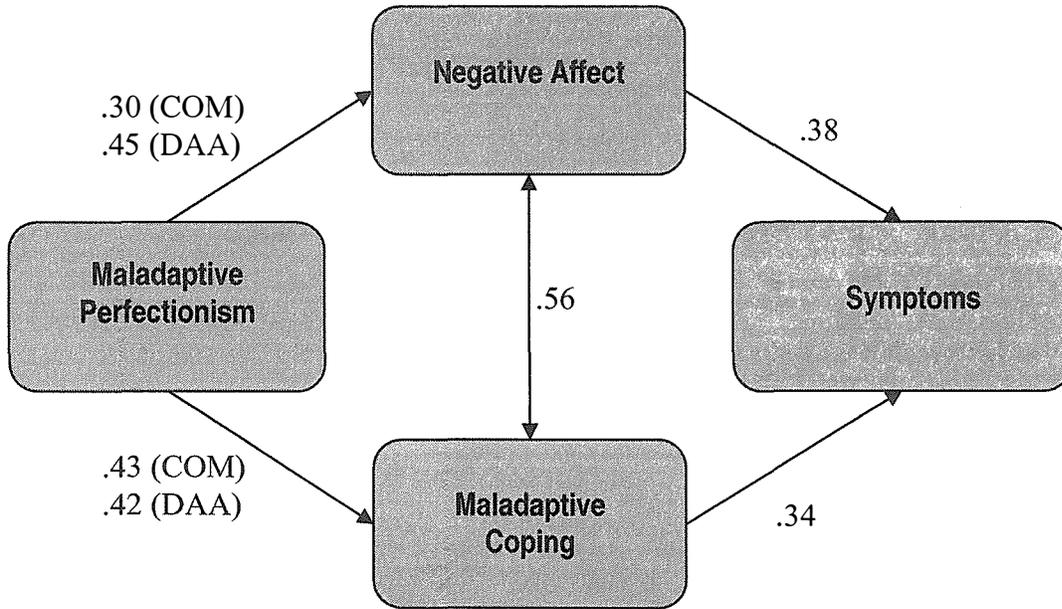


Figure 4. Maladaptive perfectionism predicts fewer physician visits, and this relation is mediated by adaptive coping

