



A mediated model of perfectionism, affect, and physical health

Danielle S. Molnar ^{*}, Dana L. Reker, Neil A. Culp, Stan W. Sadava,
Nancy H. DeCourville

Department of Psychology, Brock University, St. Catharines, Ont., Canada L2S 3A1

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Abstract

This study tested a structural model in which positive and negative affect mediate the relationship between perfectionism and physical health. A community sample of young adults completed questionnaires including the Multidimensional Perfectionism Scale (MPS-H; Hewitt & Flett, 1991b), the Positive and Negative Affect States Survey (PANAS; Watson, Clark, & Tellegen, 1988) and items assessing three aspects of physical health. Results supported a structural model in which self-oriented perfectionism was associated with better physical health and this relationship was fully mediated by high positive affect and low negative affect. In contrast, socially prescribed perfectionism was associated with poorer physical health and this relationship was partially mediated by low positive affect and high negative affect. These findings are discussed in terms of the adaptive and maladaptive aspects of perfectionism within a general context of linkages between personality and health.
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1. Introduction

Despite advances in our understanding of how perfectionism is related to mental health, relatively little is known about how perfectionism is related to physical health. This is surprising, given the plethora of research uncovering relationships between psychological factors and physical health (Cohen & Rodriguez, 1995; Friedman & Booth-Kewley, 1987;

^{*} Corresponding author. Fax: +1 905 688 6922.
E-mail address: moon@iaw.on.ca (D.S. Molnar).

Friedman et al., 1984; Leventhal, Hansell, Diefenbach, Leventhal, & Glass, 1996; Littrell, 1996; Meeks, Murrell, & Mehl, 2000; Pettit, Kline, Gencoz, Gencoz, & Joiner, 2001) and the recent resurgence of interest in studying the robust relationship between personality and health. Therefore, the objectives of the present study were to test whether specific dimensions of perfectionism, those of self-oriented, socially prescribed, and other-oriented perfectionism are differentially related to physical health. We test a model in which the link between perfectionism and health is mediated by affect.

Considerable attention has been directed toward increasing our understanding of perfectionism, a personality construct in which individuals are predisposed to set unrealistically high standards and to make self-esteem contingent on attaining these standards (Burns, 1980; Frost, Marten, Lahart, & Rosenblate, 1990b). On the one hand, Adler (1956) argues that striving to meet high standards and aspiring for perfection are part of the human condition leading to personal growth and improvement. On the other hand, some empirical research treats perfectionism as maladaptive, associated only with negative outcomes. For example, Pacht (1984) postulated that perfectionism can only result in maladjustment and psychological problems because perfectionists are either disappointed when they do not meet their excessively high standards, or fail to experience satisfaction when they are able to accomplish their goals. To address this contradiction, recent research has taken a multidimensional approach to the study of perfectionism.

In this study, we apply this approach by employing Hewitt and Flett's (**1991b) Multidimensional Perfectionism Scale (MPS-H) to examine the relationship between perfectionism and physical health. The MPS-H assesses three dimensions of perfectionism centred on interpersonal source and direction: self-oriented perfectionism, setting excessively high personal standards, accompanied by a strong motivation to attain perfection; other-oriented perfectionism, a tendency to hold exceedingly high standards for other people; and socially prescribed perfectionism, the perception that significant others place exceptionally high standards on them and evaluate them stringently (Flett & Hewitt, 2002). The reliability and validity of the MPS-H have been shown to be quite impressive (Hewitt, Flett, Turnbull-Donovan, & Mikail, 1991). Recent research findings with regard to the Five-Factor Model of personality (see McCrae & John, 1992) suggest that self-oriented perfectionism incorporates the adaptive components of perfectionism while socially prescribed perfectionism tends to encompass the maladaptive aspects of perfectionism. For example, research has supported the notion that self-oriented perfectionism is positively correlated with the conscientiousness factor, especially with achievement striving (Hill, McIntire, & Bacharach, 1997), while the self-criticism associated primarily with socially prescribed perfectionism is positively correlated with neuroticism, and negatively associated with conscientiousness, agreeableness, extraversion, the value facets of openness to experience, and the trust facet of agreeableness (Dunkley, Blankstein, & Flett, 1997). Thus, Hewitt and Flett's (1991b) multidimensional model of perfectionism maps well on the larger structural framework of personality.

The implication that perfectionism has both maladaptive and adaptive correlates is also congruent with the distinctions that have been made in terms of Hamachek's (1978) 'normal' versus 'neurotic' perfectionists, Terry-Short, Owens, Slade, and Dewey's (1995) 'positive' versus 'negative' perfectionism, Adkins and Parker's (1996) 'passive' versus 'active' perfectionism, and Rice, Ashby, and Slaney's (1998) 'adaptive' versus 'maladaptive' perfectionism. These theoretical distinctions have been supported empirically. Factor analytic studies of perfectionism measures have revealed clear two-factor solutions, which

researchers have interpreted as representing adaptive and maladaptive features of perfectionism (Bieling, Israeli, & Antony, 2004; Frost, Heimberg, Holt, Mattia, & Neubauer, 1993; Slaney, Ashby, & Trippi, 1995).

According to Hamachek (1978) 'normal' perfectionists gain pleasure from their arduous efforts, and they are able to strive for success in a flexible manner. Moreover, 'normal' perfectionists are able to accept both personal and situational limits and are able to set challenging, yet reasonable goals, which allows them to excel, to become emotionally invested in their activities, and to enjoy their successes (Flett, Hewitt, Blankstein, & O'Brien, 1991b). Hewitt and Flett's (1991b) self-oriented perfectionism has been considered to have adaptive potential and to exemplify elements of Hamachek's (1978) 'normal' perfectionism (Frost et al., 1993; Slaney et al., 1995).

In contrast, Hewitt and Flett's (1991b) socially prescribed perfectionism has been found to reflect Hamachek's (1978) 'neurotic' perfectionism (see Frost et al., 1990b, 1993; Hamachek, 1978; Slaney et al., 1995). According to Hamachek (1978), 'neurotic' perfectionists believe they must meet excessively high standards and leave relatively little margin for error or failure. 'Neurotic' perfectionists are often unable to meet these exceptionally high standards because they are unrealistic, which results in stress, low self-esteem, depression, and anxiety. Ironically, 'neurotic' perfectionists are also unable to experience satisfaction from their painstaking efforts even when successful because they often deem their achievements as unworthy. Thus, it is not surprising that 'neurotic' perfectionism is associated with maladjustment (Saboonchi & Lundh, 1997). In short, self-oriented perfectionism tends to reflect achievement striving and the pursuit of success, which tends to result in psychological well-being, whereas socially prescribed perfectionism exemplifies the profound need to avoid failure, which results in poor mental health (Slade & Owens, 1998).

A large body of research has emerged suggesting a link between perfectionism and mental health. Indeed, perfectionism has been associated with depression (Flett, Besser, Davis, & Hewitt, 2003; Flett, Hewitt, Blankstein, & Mosher, 1991a, 1991b; Frost, Benton, & Dowrick, 1990a; Hewitt & Flett, 1991a, 1993; Hewitt, Flett, & Ediger, 1996; Rice et al., 1998), anxiety (Alden, Bieling, & Wallace, 1994; Antony, Purdon, Huta, & Swinson, 1998; Flett, Hewitt, Endler, & Tassone, 1995; Flett, Madorsky, Hewitt, & Heisel, 2002; Kawamura, Hunt, Frost, & DiBartolo, 2001), suicidal ideation (Adkins & Parker, 1996; Hewitt, Flett, & Turnbull-Donovan, 1992; Hewitt, Flett, & Weber, 1994), hopelessness (O'Connor & O'Connor, 2003), negative affect (Dunkley, Zuroff, & Blankstein, 2003; Frost et al., 1993; Hewitt & Flett, 1991a; Saboonchi & Lundh, 2003; Sorotzkin, 1985), personality disorders (Broday, 1988; Wonderlich & Swift, 1990), obsessive-compulsive disorder (Antony et al., 1998; Frost et al., 1990b; Frost & Steketee, 1997; Rheaume, Ladouceur, & Freeston, 2000), and eating disorders (Cooper, Cooper, & Fairburn, 1985; Sutandar-Pinnock, Woodside, Carter, Olmsted, & Kaplan, 2003). Of greater interest, researchers have begun to distinguish which dimensions of perfectionism are related to maladjustment and psychological problems and which are not. For example, Hewitt and Flett's (1991b) dimensions of perfectionism have been found to be differentially related to mental health. In general, socially prescribed perfectionism is consistently associated with psychological distress, whereas other-oriented and self-oriented perfectionism tend to be associated with both positive and negative aspects of psychological health (see Enns & Cox, 2002 for review). For example, some researchers have reported significant positive associations between self-oriented perfectionism and depression (Hewitt & Flett, 1991a, 1993), while others have found evidence to suggest that this dimension may be related to enhanced

psychological well-being (Flett et al., 1991a, 1991b; Flett, Hewitt, Blankstein, & Dynin, 1994; Frost et al., 1993). Hewitt and Flett (1993) accounted for these disparate findings by demonstrating that the relationship between self-oriented perfectionism and depression is moderated by daily stress, such that only self-oriented perfectionists who report high levels of daily stress exhibit high levels of depressive symptomatology.

Although the relationship between perfectionism and mental health is becoming clearer, relatively little is known about how perfectionism is related to physical health, which is remarkable, given the recent rekindling of interest in studying the robust relationship between personality and health. Thus, one of the goals of the present study was to test whether specific dimensions of perfectionism, those of self-oriented, socially prescribed, and other-oriented perfectionism are differentially related to physical health.

The few studies that have examined the relationship between perfectionism and physical health have provided evidence of a direct link between perfectionism and health. In his review of the literature, Pacht (1984) found that perfectionism was significantly related to various disorders, such as irritable bowel syndrome, erectile dysfunction, abdominal pain in children, and ulcerative colitis. Moreover, perfectionism has been found to be associated with an array of somatic problems, such as migraine headaches (Burns, 1980; Kowal & Pritchard, 1990), chronic pain (Van Houdenhove, 1986), headaches (Stout, 1984), and asthma (Morris, 1961). However, these studies defined perfectionism as a unidimensional construct, which did not permit researchers to examine whether the specific dimensions of perfectionism were differentially related to health. One exception to this is research by White and Schweitzer (2000) who utilized Frost et al.'s (1990b) Multidimensional Perfectionism Scale (MPS-F) to examine the relationship between chronic fatigue syndrome (CFS) and perfectionism. Their results supported the notion that specific dimensions of perfectionism were related to chronic fatigue syndrome, in that the most significant differences between the CFS group and the control group were on the dimensions of concern over mistakes and doubts over action.

Saboonchi and Lundh (2003) also employed a multidimensional approach to examine the link between perfectionism and somatic health in a general population sample. Utilizing the MPS-H, they found that self-oriented and socially prescribed perfectionism were positively correlated with somatic complaints such as daytime sleepiness, headaches, tension, and insomnia. However, the relationship between socially prescribed perfectionism and somatic complaints was significant only for women. Finally, Martin, Flett, Hewitt, Krames, and Szanto (1996) utilized the MPS-H and found that only socially prescribed perfectionism was negatively associated with physical health.

Although the existing literature suggests a relationship between perfectionism and health, critical issues remain unclear. First, the nature of the relationships between Hewitt and Flett's (1991b) dimensions of perfectionism and physical health are not yet fully understood, as reported findings are not entirely consistent (Martin et al., 1996; Saboonchi & Lundh, 2003). Second, past research has been inconsistent with regard to finding sex differences in the association between perfectionism and health. Finally, factors that may mediate the relationship between perfectionism and physical health remain largely unknown. These issues are addressed in the present study.

One possible mechanism mediating the relationship between perfectionism and physical health is affect. Two prominent research traditions have emerged within the research literature with regard to positive and negative affect. The bivariate model of affect states that positive and negative affect are independent constructs, but does allow for small correla-

tions between the two constructs due to the possibility of coactivation. Watson (1988) is a proponent of this approach in that he has conceptualized affect as representing two dimensions: positive activation, which refers to pleasurable engagement with the environment, and negative activation, which is a general factor of subjective distress. Conversely, the bipolar model of affect postulates that positive and negative affect are simply polar opposites on a one-dimensional scale and predicts that these constructs share an inverse relationship. Research has supported both models, (see Reich, Zautra, & Davis, 2003) which has given rise to a third approach to the study of affect that integrates both the bivariate and bipolar models of affect, the Dynamic Model of Affect (DMA). The model posits that positive and negative affect are best conceptualized as bivariate, except when individuals are under high levels of stress because high levels of stress are thought to reduce information processing, such that stress diminishes positive information processing while enhancing negative affectivity to cope with the situation (Reich et al., 2003). Recent research has emerged which supports the DMA (Zautra, Reich, Davis, Nicolson, & Potter, 2000; Zautra, Smith, Affleck, & Tennen, 2001). Given that our sample was comprised of individuals from the general population and not believed to be under unusually high levels of stress, we adopted the bivariate model of affect in our model.

Since perfectionism has adaptive and maladaptive correlates, the relationship between perfectionism and affect may be specific to the dimension of perfection. It is plausible that the constant striving, overgeneralization of failure, all or none thinking, and excessively high standards associated with socially prescribed perfectionism (Hewitt & Flett, 1993) increase negative affect and decrease positive affect which, in turn, could have a negative influence on health. On the other hand, it is possible that the self-satisfaction and rewards associated with self-oriented perfectionism, increase positive affect and decrease negative affect, which could have a positive influence on physical health.

Recent research has provided evidence of relationships between perfectionism and affect. Adaptive perfectionism, for example, has been reported to be associated with fewer self-defeating behaviors in evaluative situations, and less vulnerability to negative affect (Bieling, Israeli, Smith, & Antony, 2003; Enns, Cox, Sareen, & Freeman, 2001; Rheume et al., 2000). Self-oriented perfectionism has been associated with higher levels of positive affect (Frost et al., 1993). Conversely, socially prescribed perfectionism has been found to be consistently related to higher levels of negative affect, depression, and psychological distress (Hewitt & Flett, 1991a; Saboonchi & Lundh, 2003). Thus, empirical evidence supports different relationships between self-oriented and socially prescribed perfectionism and positive and negative affect.

The finding that affect has a significant relationship with physical health is also well documented. For example, negative affect is thought to be a health risk, associated with unhealthy patterns of physiological functioning. Indeed, empirical work has supported the notion that negative affect is related to health complaints and symptoms (Cohen et al., 1995; Diefenbach, Leventhal, Leventhal, & Patrick-Miller, 1996; Leventhal et al., 1996; Watson & Pennebaker, 1989) and associated with increased vulnerability to illness (Cohen et al., 1995; Cohen & Rodriguez, 1995; Labott, Ahleman, Wolever, & Martin, 1990). Contradictory findings have been reported regarding the association between positive affect and health, as some researchers have found that positive affect is unrelated to self-reported health problems (Watson & Pennebaker, 1989), while others have reported that positive affect has a significant relationship with health (Pettit et al., 2001; Salovey, Rothman, Detweiler, & Steward, 2000; Watson, 1988). Thus, we have the conditions

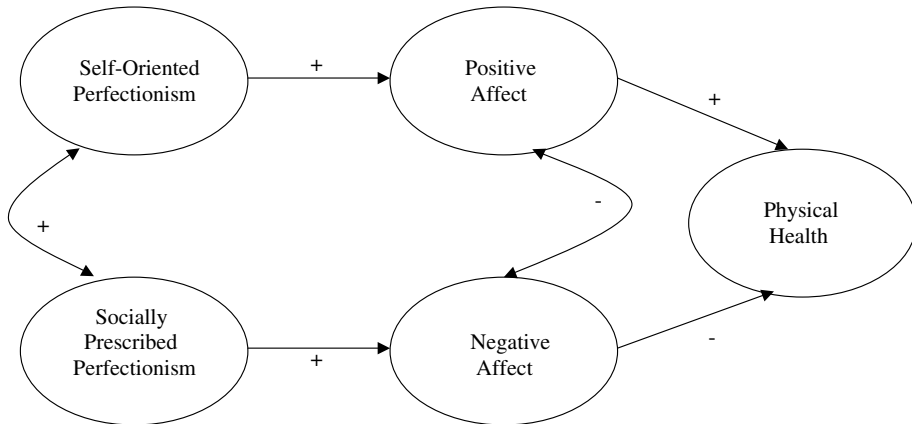


Fig. 1. Hypothesized structural model relating perfectionism, affect, and physical health.

for mediation (Baron & Kenny, 1986); that is, perfectionism is related to health, perfectionism is related to affect, and affect is related to health.

In this study, we tested a model of perfectionism and physical health (see Fig. 1) utilizing structural equation modelling procedures. First, we defined perfectionism using Hewitt and Flett's (1991b) three dimensions. Second, we proposed differential effects of these dimensions on physical health. Finally, we hypothesized that positive and negative affect would mediate the relationship between perfectionism and physical health.

Based on our review of the literature, we posited that self-oriented perfectionism would be related to higher levels of positive affect, which, in turn, would be related to better health. Additionally, we hypothesized that socially prescribed perfectionism would be associated with higher levels of negative affect which, in turn, would be related to poorer health. We reasoned that other-oriented perfectionism should be unrelated to health because it involves an external focus on other's shortcomings rather than shortcomings of the self. Therefore, although a possible link between other-oriented perfectionism and health was explored, it was not part of our hypothesized model because there is neither any theoretical rationale nor empirical evidence relating other-oriented perfectionism to health.

2. Method

2.1. Participants

Participants between the ages of 24 and 35 years, living in the Niagara and Halton regions, were recruited for the Niagara Young Adult Health Survey (NYAHS) using random digit dialling ($M = 31$ years, $SD = 2.8$ years). Questionnaires were mailed to participants along with an addressed, stamped, return envelope. Participants were contacted by telephone before and after the questionnaires were sent out to optimize sample retention and data quality. The original data set consisted of 537 young adults from the community. Participants missing more than 30% of data were excluded from further analyses, leaving a final sample of 492 (194 men and 298 women) (Table 1).

Table 1
Model fit indices for the measurement models

Model	Fit indices				
	χ^2	df	GFI	CFI	RMSEA
Perfectionism	70.09	24	.97	.98	.06
Affect	10.20	8	.99	1.00	.02
Physical health	12.65	2	.99	.98	.10

Note. GFI, goodness-of-fit index; CFI, comparative fit index; RMSEA, root mean-square error of approximation.

2.2. Measures

2.2.1. Perfectionism

Hewitt and Flett's (1991b) Multidimensional Perfectionism Scale (MPS-H) was used to assess perfectionism. The MPS-H is comprised of three subscales, which measure different sources and foci of perfectionistic standards. 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 cannot stand to see people close to me make mistakes"). Finally, 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"). The total scale consists of 45 items, with 15 items per subscale. Items were assessed using a Likert scale ranging from 1 (*disagree*) to 7 (*agree*). The MPS-H and all of its subscales have been thoroughly tested for reliability and validity in both clinical and nonclinical samples (Flett et al., 1991a, 1991b; Hewitt et al., 1991). See Table 2 for sample reliability coefficients.

Table 2
Means and standard deviations of participants' scores on perfectionism, affect, and physical health

Measures	<i>M</i>	<i>SD</i>	α
<i>Perfectionism</i>			
Self-oriented	67.92	16.25	.89
Socially prescribed	49.80	13.56	.83
Other-oriented	53.64	12.08	.78
<i>Affect</i>			
Negative affect	18.82	6.05	.89
Positive affect	31.94	5.21	.87
<i>Physical health</i>			
Number of symptoms	81.46	9.77	.87
Perceived health	2.97	.74	Single item
Number of MD visits	5.34	1.53	Single item
Number of days sick in bed	5.42	1.48	Single item

Note. *N* = 492.

2.2.2. Affect

The Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) is a 20-item scale that was used to measure positive and negative affect. Participants rated 10 positive (e.g., alert, excited, and interested) and 10 negative emotions/feelings (e.g., distressed, guilty, and jittery) according to how much they generally (on average) experienced each of the feelings listed. Response options for this scale ranged from 1 (*not at all*) to 5 (*extremely*). The factor structure of the PANAS has been independently confirmed (Crocker, 1997) and the PANAS has been reported to have acceptable reliability for both positive and negative affect (Watson et al., 1988). See Table 2 for sample reliability coefficients.

2.2.3. Physical health

Four indicators were used to create a latent variable for physical health: perceived health, symptoms, and two items that assess medical illness. Perceived health was a single item in which participants rated their overall physical health as compared to others of their age on a Likert scale ranging from 1 (*poor*) to 4 (*excellent*).

Symptoms (adapted from Macmillan, 1957) were assessed by computing a composite variable of 21 items pertaining to sleep problems, shortness of breath, upset stomach, pains and ailments, fatigue, and the extent to which ill health affected their daily functioning. Participants rated how frequently they experienced each symptom on a Likert scale ranging from 1 (*never*) to 5 (*always*). All items were recoded prior to analyses, such that higher values indicate better health. See Table 2 for the sample reliability coefficient.

Two items were used as indicators to assess medical illness: number of visits to a physician, and number of days sick in bed over the past 2 years. Each of these items was measured on a Likert scale ranging from 1 (0) to 7 (*more than 15*). Both items were recoded prior to analyses such that higher values indicate better health.

3. Results

3.1. Statistical analyses

Using the statistical analysis package, EQS (Bentler, 1993, 5.7), structural equation modelling (SEM) was conducted in two phases. In the first phase of analyses, confirmatory factor analyses were used to determine the adequacy of fit to the data for our proposed measurement models (self-oriented and socially prescribed perfectionism, positive and negative affect and physical health).¹ In the second phase of analyses, path analysis was used to test our structural model in which positive and negative affect mediates the association between perfectionism and self-reported physical health. Multiple group analyses were also conducted to test whether our measurement and structural models were invariant with respect to sex.

¹ As noted, there is no consistent empirical support for a relationship between other-oriented perfectionism and physical health. Nevertheless, we tested a model, which included this dimension and found *no* relationship with health. When other-oriented perfectionism was excluded from our model, the fit of the model was significantly better ($\chi^2_{\text{difference}}(45) = 74.24, p < .005$). Therefore, other-oriented perfectionism was *excluded* from further analyses.

Maximum likelihood (ML) was used to estimate each model, raw data served as the input, and each latent variable was scaled by fixing one of its indicator paths to 1.0. Several indices were used to assess the fit of our models: the comparative fit index (CFI; Bentler, 1988), the goodness of fit index (GFI; Tanaka & Huba, 1989), and the root mean-square error of approximation (RMSEA; Browne & Cudeck, 1993). A GFI of .90 or greater, a CFI of .95 or greater, and a RMSEA of .06 or lower were used to indicate an adequate fit (Kline, 1998; Tabachnick & Fidell, 2001). Although a nonsignificant chi square (χ^2) value generally is used to indicate a well-fitting model, it is highly sensitive to sample size (Kline, 1998). Thus, to reduce the sensitivity of the χ^2 statistic to sample size, we used a χ^2/df value of less than 5 to indicate an adequate fit (Wheaton, Muthen, Alwin, & Sunners, 1977).

3.2. Measurement models

Prior to conducting confirmatory factor analyses, a parcelling technique was employed to create indicators for the following latent variables: socially prescribed and self-oriented perfectionism, and positive and negative affect. We used parcels instead of individual items for four reasons: First, relative to individual items, parcels exhibit distributions that more closely approximate a normal distribution; second, using parcels reduces the number of parameters to be estimated in the models; third, using parcels improves reliability (Kishton & Widaman, 1994); and finally, using parcels enhances the stability of the parameters (West, Finch, & Curran, 1995). Parcels for each dimension of perfectionism, and for positive and negative affect were constructed by randomly assigning individual items corresponding to their particular latent variable to one of three parcels. To avoid identification problems, three parcels per latent variable were generated (West et al., 1995). Parcelling was not employed to create the latent variable for physical health because it consisted of four distinct indicators (not individual items): perceived health, number of symptoms, number of days sick in bed, and number of visits to a physician.²

Three confirmatory factor analyses were conducted to test each of the measurement models. As displayed in Table 1, results of the analyses revealed that our measurement models provided an adequate fit to the data. Means, standard deviations, as well as scale reliabilities for all variables are presented in Table 2.

3.3. Structural model

Our model predicted that affect would mediate the relationship between perfectionism and physical health. The criteria for mediation are as follows: (1) there must be a significant relationship between the independent variable (i.e., perfectionism) and the

² In the absence of a commonly accepted “gold standard” for the measurement of self-reported health, it was necessary to adopt a multi-measurement strategy, and to eschew assumptions of equivalence amongst number of days sick in bed, number of visits to a physician, number of symptoms, and perceived health measures. Therefore, we sought common variance amongst these four measures by developing a latent variable measurement model (see Newcomb & Bentler, 1987). The second-order common factor for health was acceptable, which is evident by the fact that this factor represented ample variance in number of days sick in bed, number of physician visits, symptoms, and perceived health (path coefficients were .66, .73, .71, and .59, respectively).

Table 3
Intercorrelations among all manifest variables

Variable	1	2	3	4	5	6	7	8
1. Self-oriented	—							
2. Other-oriented	.52***	—						
3. Socially prescribed	.43***	.38***	—					
4. Perceived health	.09	.01	-.21***	—				
5. Symptom score	-.02	.06	-.29***	.44***	—			
6. MD visits	.09*	.10*	-.06	.36***	.49***	—		
7. # Sick days in bed	.11*	.02	-.08	.30***	.45***	.52***	—	
8. Positive affect	.28***	.17***	-.13**	.36***	.31***	.17***	.18***	—
9. Negative affect	.06	.00	.35***	-.23***	-.53***	-.22***	-.19***	-.35***

* $p < .05$.

** $p < .01$.

*** $p < .001$.

mediator (i.e., affect); (2) a significant relationship between the mediator (i.e., affect) and the dependent variable (i.e., physical health); (3) a significant relationship between the independent variable (i.e., perfectionism) and the dependent variable (i.e., physical health); and (4) a significant reduction in the relationship between the independent variable (i.e., perfectionism) and the dependent variable (i.e., physical health) when the mediator (i.e., affect) is included in the model (Baron & Kenny, 1986). A series of four models was tested to determine whether these criteria were met. First-order correlations among all manifest variables are presented in Table 3.

3.4. Model 1: Perfectionism and physical health

The first model tested the relationship between perfectionism and physical health using two latent variables (self-oriented perfectionism and socially prescribed perfectionism) to represent the independent variable and one latent variable to represent the dependent variable (physical health). This model fit the data reasonably well ($\chi^2(31) = 82.28$, $p < .001$, $\chi^2/df = 2.65$, GFI = .97, CFI = .98, RMSEA = .06). As expected, the path coefficient between self-oriented perfectionism and health was significant and positive (+.26), and the estimate for the path between socially prescribed perfectionism and physical health was significant and negative (-.43). Additionally, self-oriented and socially prescribed perfectionism were positively related ($r = +.48$). The latent variable loadings were all significant ($p < .001$), with perfectionism accounting for 14% of the variance in physical health.

Multiple goodness of fit indices revealed that the results of the multiple group analysis were virtually identical for men and women (i.e., GFI = .95, CFI = .97, RMSEA = .05).

3.5. Model 2: Perfectionism and affect

The second model tested the relationship between perfectionism and affect using two latent variables (self-oriented perfectionism and socially prescribed perfectionism) to represent the independent variable and two latent variables (positive and negative affect) to

represent the mediator.³ In addition to testing the hypothesized model, we tested an alternative model that included two additional paths, a path from self-oriented perfectionism to negative affect, and from socially prescribed perfectionism to positive affect. Based on criteria for model fit, the revised model fit the data well ($\chi^2(48) = 84.11$, $p < .001$, $\chi^2/\text{df} = 1.75$, GFI = .97, CFI = .99, RMSEA = .04). The path coefficient between self-oriented perfectionism and positive affect was significant and positive (+.51), and the estimate for the path between socially prescribed perfectionism and positive affect was significant and negative (−.39). Conversely, the path coefficient between self-oriented perfectionism and negative affect was significant and negative (−.15), and the estimate for the path between socially prescribed perfectionism and negative affect was significant and positive (+.46). As expected, self-oriented and socially prescribed perfectionism were positively related ($r = +.48$), and positive and negative affect were negatively related ($r = -.33$). All of the latent variable loadings were significant ($p < .001$) with perfectionism accounting for 22% of the variance in positive affect and 17% of the variance in negative affect.

Multiple goodness of fit indices revealed that the results of the multiple group analysis were virtually identical for men and women (i.e., GFI = .95, CFI = .98, RMSEA = .03).

3.6. Model 3: Affect and physical health

The third model tested the relationship between affect and physical health, using two latent variables (positive and negative affect) to represent the mediator and one latent variable (physical health) to represent the dependent variable. Based on criteria for model fit, this model fit the data reasonably well ($\chi^2(31) = 109.55$, $p < .001$, $\chi^2/\text{df} = 3.53$, GFI = .96, CFI = .97, RMSEA = .07). As expected, the path coefficient between positive affect and physical health was significant and positive (+.19), and the estimate for the path between negative affect and physical health was significant and negative (−.50). In addition, positive and negative affect were negatively related ($r = -.38$). All latent variable loadings were significant ($p < .001$), with affect accounting for 36% of the variance in physical health.

Multiple goodness of fit indices revealed that the results of the multiple group analysis were virtually identical for men and women (i.e., GFI = .95, CFI = .97, RMSEA = .05).

3.7. Mediation model

According to Baron and Kenny (1986), the last criterion for establishing a mediation model requires that the association between the independent variable (perfectionism) and the dependent variable (physical health) should be substantially reduced when the influence of the mediating variable (affect) is included. To test this final requirement, a mediated model, which included a path from self-oriented perfectionism to physical health and from socially prescribed perfectionism to physical health, was estimated. In comparison to the originally hypothesized model (see Fig. 1), the model with additional pathways from self-oriented perfectionism to negative affect and socially prescribed perfectionism to

³ Due to shared variance, a correlation between self-oriented and socially prescribed perfectionism, and between positive and negative affect were specified a priori in the measurement and structural models.

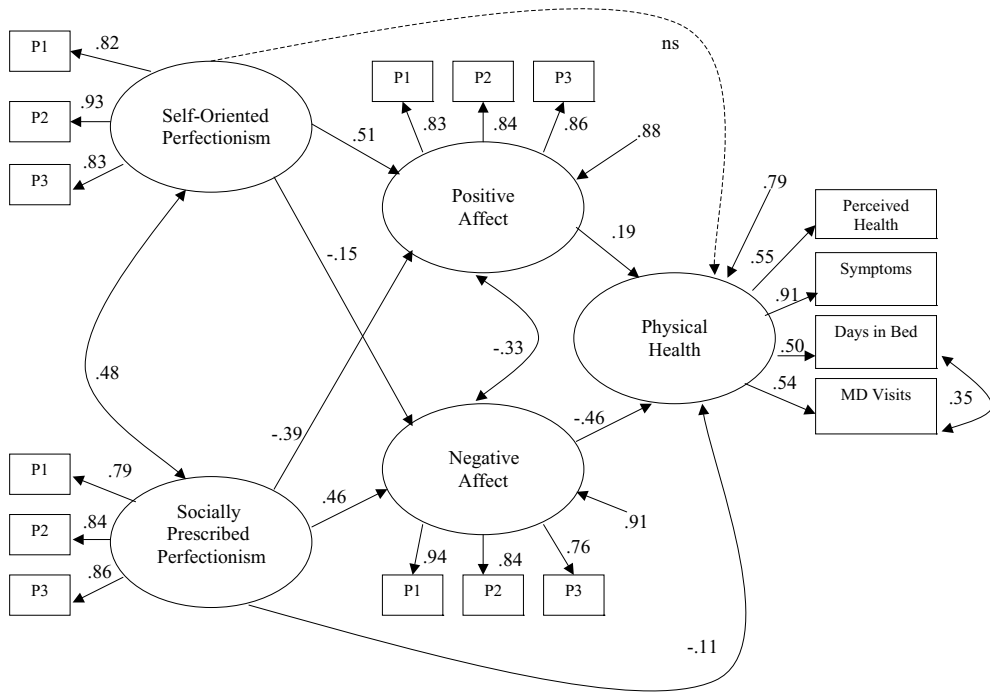


Fig. 2. Standardized parameter estimates of the final structural model relating perfectionism, affect, and physical health.

positive affect enhanced the fit of the final model ($\chi^2(93) = 221.53, p < .001, \chi^2/df = 2.37, GFI = .95, CFI = .97, RMSEA = .05, \chi^2_{\text{difference}}(2) = 49.53, p < .001$).⁴ The results of the final SEM model are presented in Fig. 2. When positive and negative affect were entered into the model, the relationship between self-oriented perfectionism and physical health was no longer significant. In contrast, the relationship between socially prescribed perfectionism and physical health remained significant. The mediated model accounted for 37% of the variance in physical health. Thus, while affect fully mediated the relationship between self-oriented perfectionism and physical health, affect only partially mediated the relationship between socially prescribed perfectionism and physical health.

As for possible sex differences, based on criteria for goodness of fit, the mediated model was virtually identical for men and women, indicating that there were no sex differences with our young adult community sample ($\chi^2(206) = 357.76, p < .001, GFI = .92, CFI = .96, RMSEA = .04, \chi^2/df = 1.73$).

4. Discussion

In this study, we examined the relationship between perfectionism and physical health in a community sample of young adults. Our study was one of the first to use rigorous

⁴ The fit indices for the originally hypothesized model were as follows: $\chi^2(95) = 271.06, p < .001, \chi^2/df = 2.85, GFI = .94, CFI = .96, RMSEA = .06$.

structural equation modelling to investigate the differential effects of Hewitt and Flett's (1991b) dimensions of perfectionism on physical health, and to test whether positive and negative affect would mediate the influence of perfectionism on physical health. A number of interesting findings emerged. First, our model accounted for a significant proportion of the variance in physical health and was invariant with respect to sex, attesting to the importance of studying perfectionism in relation to physical health. These findings are consistent with the psychological literature that has provided evidence of a robust relationship between personality factors and physical health (Cohen & Rodriguez, 1995; Friedman & Booth-Kewley, 1987; Friedman et al., 1984).

Second, the use of Hewitt and Flett's (1991b) multidimensional model of perfectionism revealed consistent and unique relationships between the dimensions of perfectionism and health. As predicted, socially prescribed perfectionism was related to poorer health, while self-oriented perfectionism was associated with better physical health. These findings are consistent with the idea that perfectionism imposed by the self is motivating, associated with feeling good, but when perceived to be coming from others is stressful and even detrimental to health. Moreover, our results are in concert with research that conceptualizes individual differences in terms of their empirical location within the Five-Factor Model of personality (e.g., McCrae & John, 1992). On the one hand, self-oriented perfectionism and positive affect have been shown to be most relevant to the adaptive components of conscientiousness and extraversion (i.e., achievement-striving, activity, assertiveness, and assertiveness). On the other hand, socially prescribed perfectionism and negative affect are primarily related to the broader domain of neuroticism (Dunkley et al., 1997; Hill et al., 1997; Watson & Clark, 1992). Further differentiating self-oriented perfectionism from socially prescribed perfectionism are research findings that have demonstrated that self-oriented perfectionism has a positive association with self-efficacy, but that socially prescribed perfectionism has a negative relationship with self-efficacy (Martin et al., 1996). Therefore, our results are consistent with earlier literature and with the notion that self-oriented perfectionism and socially prescribed perfectionism correspond to fundamentally different and broader dimensions of personality.

Third, we found that while our original model (see Fig. 1) fit the data well, it was greatly enhanced by the addition of two theoretically coherent paths; a path from self-oriented perfectionism to negative affect and a path from socially prescribed perfectionism to positive affect. The addition of these two paths adds weight to the notion that self-oriented perfectionism is adaptive, not only increasing positive feelings, but also ameliorating negative feelings, whereas, socially prescribed perfectionism is maladaptive, not only resulting in negative feelings, but also diminishing positive affect.

Finally, the relationship between self-oriented perfectionism and health was fully mediated by affect, whereas the relationship between socially prescribed perfectionism and health was partially mediated by affect. Consistent with our hypotheses, socially prescribed perfectionism was related to higher levels of negative affect and lower levels positive affect, which, in turn, was associated with poorer physical health. In contrast, self-oriented perfectionism was associated with higher levels of positive affect and lower levels of negative affect, which, in turn, was related to better health. Thus, the present study provides support for the notion that both positive emotional states and psychological distress can, in part, explain the relationship between perfectionism and health.

The finding that the relationship between socially prescribed perfectionism and health was only partially mediated by affect (i.e., both direct and indirect effects from socially

prescribed perfectionism to health were found) suggests that unique factors other than affect may mediate their association. One such factor may be coping style. For instance, research has demonstrated that socially prescribed perfectionism is related to maladaptive coping, such that socially prescribed perfectionists tend to rely on emotion-focused coping, engage in self-blame, show a lack of constructive thinking, and deal with stressful situations in ways that indicate a sense of helplessness or hopelessness (Dunkley & Blankstein, 2000; Flett, Russo, & Hewitt, 1994; Hewitt, Flett, & Endler, 1995). In addition, research by Endler and Parker (1990) has found that coping style has a pivotal role in a myriad of adjustment outcomes, such as depression and somatic complaints. Taken together, these findings suggest that maladaptive coping may further contribute to explaining the link between socially prescribed perfectionism and health.

In summary, our results lend support to the notion of perfectionism being a double-edged sword, having both adaptive and maladaptive aspects with regard to health. The finding that self-oriented perfectionism is related to higher levels of positive affect and lower levels of negative affect is in line with past empirical work, which has found that self-oriented perfectionism taps more adaptive than maladaptive aspects of perfectionism (Bieling et al., 2003; Enns et al., 2001; Lynd-Stevenson & Hearne, 1999; Slade & Owens, 1998). Moreover, the finding that socially prescribed perfectionism is positively related to negative affect, lower levels of positive affect, and poorer health is consistent with past studies, which have demonstrated that socially prescribed perfectionism taps the maladaptive aspects of perfectionism (Dunkley et al., 2003; Frost et al., 1993; Hewitt & Flett, 1991a; Saboonchi & Lundh, 2003; Sorotzkin, 1985).

Several limitations to the present study must be recognized. First, assessments of perfectionism, affect, and physical health were derived from self-report data. Self-reported health measures have been criticized, as research has shown that they not only assess actual health problems, but may also tap neuroticism (Watson & Pennebaker, 1989). However, subjective self-report measures of health have been shown to have impressive construct and predictive validity. Indeed, simply asking individuals to rate their health on one single-item scale predicts subsequent mortality, even after controlling statistically for health-risk factors, such as physician ratings, diagnosed illnesses, socioeconomic status, and health risk behaviours (see review by Idler & Benyamini, 1997). Nonetheless, it is important for researchers to corroborate the link between perfectionism and physical health with other measurement procedures.

Second, the cross-sectional design of our study along with the problem of equivalent models in SEM precludes inferences regarding the direction or temporal order of observed associations (see MacCallum, Wegener, Uchino, & Fabrigar, 1993). For instance, one could argue that affect is more temperament-based and applies to a wider range of situations and behaviours than the more narrowly focused personality construct of perfectionism. Based on this logic, one could make the case that affect should precede perfectionism in our model. On the other hand, one might not expect the influence of affect on broad health outcomes, to be fully explained by a relatively more narrow personality construct, such as perfectionism, which is more remote from a temperamental basis. Thus, narrower and less temperament-based traits such as perfectionism would not be expected to explain the affect-health link. To address this issue, an alternative model in which perfectionism was hypothesized to mediate the relationship between affect and health was tested. While results demonstrated that the fit of the alternative model was equivalent to that of our model, one important difference was readily apparent. Results showed that perfectionism

did not mediate the relationship between affect and health, suggesting that affect is more proximal to health and that our model is more conceptually sound. However, only longitudinal research utilizing a life-span perspective can truly address the issue of temporal precedence.

In addition, longitudinal studies will enhance our understanding of the dynamics by which perfectionism and affect are related to physical health. While our findings imply that self-oriented perfectionism has an impact on physical health, there are plausible alternative interpretations of our results. For example, it could be that self-oriented perfectionists are not healthier than others, but may report better health due to denial because their perfectionism does not allow them to have any flaws, such as being ill. Furthermore, it may be that socially prescribed perfectionism not only results in poorer health, but that poor health increases the perfectionist's perception that others are putting more demands on them because perfectionists do not allow themselves the luxury of the sick role. The stability of the relationship between perfectionism and health also remains unknown. Thus, a longitudinal design would allow researchers to test the trajectories of change in the relationship between perfectionism and health over time.

One advantage of the current study is that our model was tested with a community sample of young adults, rather than with a student sample, as is typical in the literature. Although a community sample offers increased generalizability of the findings, results are still restricted to a young sample that was relatively healthy. Therefore, future studies should replicate these findings with an older community sample, which would increase the variance in health status. However, the results reported in the current paper lend encouragement to research on the implications of perfectionism on physical health. Moreover, our mediated model of perfectionism demonstrates studying affect in relation to perfectionism further enhances our understanding of the social psychology of health.

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