



This is a repository copy of *Trying to be perfect in an imperfect world: A person-centred test of perfectionism and health in fibromyalgia patients versus healthy controls.*

White Rose Research Online URL for this paper:  
<http://eprints.whiterose.ac.uk/134692/>

Version: Accepted Version

---

**Article:**

Sirois, F. [orcid.org/0000-0002-0927-277X](https://orcid.org/0000-0002-0927-277X), Toussaint, L., Hirsch, J. et al. (3 more authors) (2019) Trying to be perfect in an imperfect world: A person-centred test of perfectionism and health in fibromyalgia patients versus healthy controls. *Personality and Individual Differences*, 137. pp. 27-32. ISSN 0191-8869

<https://doi.org/10.1016/j.paid.2018.08.005>

---

**Reuse**

This article is distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs (CC BY-NC-ND) licence. This licence only allows you to download this work and share it with others as long as you credit the authors, but you can't change the article in any way or use it commercially. More information and the full terms of the licence here: <https://creativecommons.org/licenses/>

**Takedown**

If you consider content in White Rose Research Online to be in breach of UK law, please notify us by emailing [eprints@whiterose.ac.uk](mailto:eprints@whiterose.ac.uk) including the URL of the record and the reason for the withdrawal request.



[eprints@whiterose.ac.uk](mailto:eprints@whiterose.ac.uk)  
<https://eprints.whiterose.ac.uk/>

**Please cite as:**

Sirois, F. M., Toussaint, L. L., Hirsch, J. K., Kohls, N., Weber, A., & Offenbächer, M. (accepted). Trying to be perfect in an imperfect world: A person-centred test of perfectionism and health in fibromyalgia patients versus healthy controls. *Personality and Individual Differences*.

Trying to be perfect in an imperfect world: A person-centred test of perfectionism and health  
in fibromyalgia patients versus healthy controls

Fuschia M. Sirois, PhD<sup>1</sup>

Loren Toussaint, PhD<sup>2</sup>

Jameson K. Hirsch, PhD<sup>3</sup>

Niko Kohls, PhD<sup>4</sup>

Annemarie Weber, BS<sup>4</sup>

Martin Offenbächer, MD<sup>5, 6</sup>

<sup>1</sup> Department of Psychology, University of Sheffield, United Kingdom

<sup>2</sup> Department of Psychology, Luther College, USA

<sup>3</sup> Department of Psychology, East Tennessee State University, USA

<sup>4</sup> Department of Psychology, Coburg University, Germany

<sup>5</sup> Gasteiner Heilstollen Hospital, Bad Gastein-Böckstein, Austria.

<sup>6</sup> University of Munich, Germany

Correspondence concerning this article should be addressed to Fuschia M. Sirois, PhD, Department of Psychology, the University of Sheffield, 1 Vicar Lane, Sheffield, United Kingdom S1 1HD; tel: +44 (0) 114 222 6552; Email: [f.sirois@sheffield.ac.uk](mailto:f.sirois@sheffield.ac.uk)

### Abstract

The Stress and Coping Cyclical Amplification Model of Perfectionism in Illness posits, that in the context of a chronic illness, both perfectionistic strivings and concerns contribute to poor health outcomes. Similarly, person-centred models, such as the tripartite model of perfectionism, claim that high levels of both perfectionism concerns and strivings reflect an “unhealthy” perfectionism that takes a toll on well-being. To date there are few comparative tests of these models for physical and mental health outcomes in healthy versus chronically ill individuals. The aim of the current study was to investigate the implications of perfectionism for health by testing how within-person combinations of perfectionism varied in relation to health outcomes, and between fibromyalgia patients ( $N = 89$ ) and healthy controls ( $N = 123$ ). Supporting both models, within-person combinations of high perfectionistic strivings and concerns were associated with high stress and poor mental and physical health compared to other within-person combinations. These links were more robust for fibromyalgia patients compared to controls, and stress mediated the association with physical health outcomes only for the fibromyalgia patients. Findings support the value of taking a person-centered approach for understanding how perfectionistic strivings contributes to poor health in the context of chronic illness.

**KEYWORDS:** perfectionism; chronic illness; stress; physical health; fibromyalgia; tripartite model; person-centred approach

## Introduction

A growing body of evidence indicates that perfectionism is a trait that can create risk or resilience for health and well-being. Perfectionism is commonly viewed by researchers as being comprised of two higher order factors, *Perfectionistic Concerns* (PC) and *Perfectionistic Strivings* (PS; Dunkley, Blankstein, Halsall, Williams, & Winkworth, 2000; Stoeber & Otto, 2006). Harsh self-scrutiny, heightened concerns about mistakes and not meeting others' perceived demands for perfection, and excessive reactions to perceived failures, are among the defining characteristics of PC that make this perfectionism dimension a vulnerability factor for poor health-related outcomes (Molnar, Sadava, Flett, & Colautti, 2012; Sirois & Molnar, 2017). PS, in contrast, is characterised by setting and compulsively striving toward often excessively high standards, which some researchers have argued can have benefits for well-being (e.g., Stoeber & Corr, 2016). Although PS has often been referred to as the “healthier” of the two perfectionism dimensions (Sirois, Monforton, & Simpson, 2010; Stoeber & Otto, 2006), emerging theory and research challenges this assumption and fuels the debate regarding whether, and under what circumstances, PS may be detrimental to health (Molnar & Sirois, 2016).

The *Stress and Coping Cyclical Amplification Model of Perfectionism in Illness* (SCCAMPI; Molnar & Sirois, 2016) proposes that in the context of living with a stressful chronic health condition, both PC *and* PS create vulnerability for adjustment. Derived from extant research on the role of perfectionism in stress and coping, the SCCAMPI provides a provisional framework for understanding how PS as well as PC may complicate adjustment to chronic illness. The SCCAMPI posits that dealing with the limitations in functioning, fatigue, and pain often associated with chronic health conditions can be particularly challenging for PC and PS perfectionists in this context because of their heightened responses to stress and maladaptive coping, which in turn negatively impact physical symptoms and

disease management behaviours.

Current research on perfectionism in chronic illness provides preliminary support for these propositions. For example, in people with inflammatory bowel disease, both PC and PS were associated with the use of maladaptive coping strategies and greater physical impact of illness (Flett, Baricza, Gupta, Hewitt, & Endler, 2011). Similar results have been found for cardiac rehabilitation patients (Shanmugasagaram et al., 2014). In a study of women with fibromyalgia, PC was associated with poorer health functioning after controlling for sociodemographic and disease variables, whereas PS had a curvilinear relationship with health functioning, with the highest and lowest levels of PS showing the poorest functioning (Molnar, Flett, Sadava, & Colautti, 2012). Living with chronic illness necessitates a renegotiating of one's goals so that they are more realistic. Because PS is associated with difficulties in disengaging from unproductive goals (Eddington, 2013), high levels of PS may be particularly harmful in the context of chronic illness.

Despite the promise of the SCCAMPI (Molnar & Sirois, 2016) for understanding the role of context when discerning whether and when PS may be healthy or not, there have been few if any studies that directly test its underlying assumptions. One key assumption of the SCCAMPI is that the challenges of living with a chronic health condition and the demand for ongoing coping efforts make PS a vulnerability factor for higher stress and thus poor health-related outcomes, whereas PS may not create the same vulnerabilities for individuals without these health challenges. Yet to date, research has primarily examined PS and its associations with health-outcomes within specific illness groups but not in comparison to a healthy control group. Another, and perhaps more fundamental, assumption that is yet to be fully addressed is that *both* PC and PS create vulnerability for poor health outcomes in the context of chronic illness. Rather than being completely distinct, PC and PS often co-occur within the same individual. Indeed, the two perfectionism dimensions are positively correlated with one

another, with one analysis of 13 diverse samples finding an average correlation of  $r = .39$  (Sirois & Molnar, 2017). Consistent with this evidence and a person-centered view of perfectionism (Gaudreau & Thompson, 2010; Smith, Saklofske, Yan, & Sherry, 2015), the SCCAMPI would therefore predict that the proposed negative effects of PS would be amplified when levels of PC are also high. Although this assumption was not made explicit in the original outlining of the SCCAMPI (Molnar & Sirois, 2016), it is nonetheless implied given the known moderate sized associations between PS and PC.

The combined effects of PC and PS are perhaps best captured by person-centered models of perfectionism, of which there are two that are most widely used. The 2 X 2 model of perfectionism (Gaudreau & Thompson, 2010) posits that four distinct perfectionism dispositions can be differentiated depending on whether PC and PS are high or low: non-perfectionists (low PC and PS), pure PC (high PC and low PS), pure PS (high PS and low PC), and mixed perfectionism (high PC and PS). In contrast, the tripartite model of perfectionism (Rice & Ashby, 2007; Stoeber & Otto, 2006), posits that only three dispositions can be differentiated: healthy perfectionism (high PS and low PC), unhealthy perfectionism (high PS and high PC), and non-perfectionism (low PS). Researchers have noted that the key distinction between these models is that the tripartite model views high levels of PS and PC as the most maladaptive combination, whereas the 2 X 2 model views high levels of PC and low levels of PS as the most maladaptive combination (Smith et al., 2015). Evidence from two large samples supports a tripartite model of perfectionism versus a 2 X 2 model, with the high PS/PC disposition found to be associated with higher levels of negative emotionality, whereas the high PC/low PS combination was associated with lower negative emotionality (Smith et al., 2015).

### **Aims and hypotheses**

The aim of the current study was to take a person-centred approach to understand the implications of PS for health in the context of chronic illness by testing both the SCCAMPI and the tripartite model of perfectionism in a sample of fibromyalgia patients (FMP), and in comparison to a healthy control group. Fibromyalgia is a common chronic pain condition affecting three to six percent of the world population (National Fibromyalgia Association, 2017). It is characterised by symptoms of muscle pain, fatigue, and tender points, with diagnoses clinically defined as widespread pain experienced for at least 3 months and accompanied by at least 11 of 18 tender points (Wolfe et al., 2010). The disruptive symptoms of fibromyalgia for sleep and daily functioning create an ongoing context of stress, and thus a relevant context to test the SCCAMPI. Not only do FMP experience higher levels of stress than healthy controls (Coppens et al., in press), but this stress can further exacerbate both physical symptoms and mental health (Van Houdenhove, Egle, & Luyten, 2005). Although the etiology of fibromyalgia is unclear, suspected risk factors include sex, obesity, and the experience of stressful events (Centers for Disease Control and Prevention, 2017).

Consistent with the tripartite model of perfectionism we expected that the dispositional combination of high PS/PC would confer the greatest risk for health-related outcomes in the form of higher stress, and poor physical and mental health, as compared to the combination of high PS/low PC, and low PS. However, we also expected that this vulnerability would be more pronounced among FMP compared to healthy controls, and that higher levels of stress associated with the high PS/PC combination would explain the links between high PS/PC and poor physical and mental health for the FMP, but not for healthy controls.

## **Methods**

### **Participants and Procedure**

Participants were 89 FMP and 123 healthy controls. As compared to healthy controls,

FMP were significantly older by about 13 years. Only one patient was male while 13 healthy controls were male. Far fewer FMP were single, slightly fewer were married, but more were widowed or divorced compared to health controls. Table 1 provides descriptive statistics and group comparisons for all socio-demographic variables.

The FMP sample was recruited via fibromyalgia self-help groups with the support of the German Fibromyalgia Patient Association. The healthy controls were a German convenience sample of volunteers without fibromyalgia that were recruited using a snowball sampling approach to garner a sample with varying ages. Recruitment took place after ethical approval from the University of Munich, and all participants gave consent to participate.

## Measures

In addition to socio-demographic questions, participants completed the following validated measures of the study constructs.

**Multidimensional Perfectionism.** The German version (Stoeber, 1995) of the Frost Multidimensional Perfectionism Scale (FMPS; Frost, Marten, Lahart, & Rosenblate, 1990) is a 35-item questionnaire that assesses six dimensions of perfectionism: concern over mistakes, doubts about actions, personal standards, parental expectations, parental criticism and organization. Items are scored on a 5-point Likert-scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Because some researchers suggest that the parental expectations and parental criticism subscales reflect the developmental antecedents of PC, rather than aspects of the core construct (Stoeber & Otto, 2006), we included only the concern over mistakes and doubts about actions subscales in the index of PC. For PS, the personal standards and organisation subscales were included, as these are the FMPS subscales most commonly used by researchers to assess PS (Sirois & Molnar, 2016). In previous research, internal consistency for the individual subscales is adequate to excellent ( $r = .73 - .93$ ) (Frost, Heimberg, Holt, Mattia, & Neubauer, 1993).

We followed the work of Smith et al. (2015) in constructing three dispositional perfectionism groups according to their scores on both PS and PC. The three-group model includes: 1) high PS/PC, 2) high PS/low PC, and 3) low PS. High and low groups were split at the median.

**Mental and physical health.** The Short Form 12 (SF-12; Ware, Keller, & Kosinski, 1998) is a widely used, well-validated general measure of health-related quality of life that has been translated into numerous languages; the German version was used in the current study. The SF-12 includes mental and physical health composite indices. Scores for each index range from 0 to 100 with higher scores indicating better mental or physical health-related quality of life. Test-retest reliability is considered the most meaningful index of reliability of the SF-12, and the mental health composite score has shown test-retest reliability coefficients of  $r = .76$  and greater (Ware et al., 1998), whereas the physical health composite score has demonstrated reliability coefficients of  $.89$  and greater.

**Perceived Stress.** A previously validated 20-item German version (Fliege, Rose, Arck, Levenstein, & Klapp, 2001) of the Perceived Stress Questionnaire (PSQ; Levenstein et al., 1993) assessed stress in the current study. Respondents rate how often they experienced each of the items on a 4-point response scale ranging from 1 (*Almost never*) to 4 (*Usually*). The German PSQ has demonstrated good construct validity and internal consistencies, Cronbach's alpha from  $.80$  to  $.86$  (Fliege et al., 2001).

### **Analytic Strategy**

Analyses included descriptive statistics,  $t$ -tests with Cohen's  $d$  effect size, bivariate correlations, and moderated mediation models using the PROCESS macro for SPSS.  $t$ -tests examined levels of stress and health outcomes across FMP and controls. Bivariate correlations examined the associations of perfectionism, stress, and health outcomes in FMP and controls. PROCESS was used to test indirect associations of perfectionism variables with

health outcomes through the mechanism of stress. PROCESS allows for the examination of moderated indirect effects (i.e., moderated mediation) to determine if the indirect associations of perfectionism with health outcomes through the mechanism of stress is stronger for FMP or controls. PROCESS uses bias-corrected bootstrapped estimates of moderated and indirect associations and moderated indirect associations. Because perfectionism, as the primary independent variable, contained three groups, dummy coding was used where indicator variables were created to represent the high PS/PC and high PS/low PC groups and the low PS group was omitted as the reference category. Therefore, reported coefficients are standardized estimates of differences between the low PS reference group and the high PS/PC and high PS/low PC group. Two separate models were estimated to examine mental and physical health outcomes. The mediator in both models was stress. The moderator in both models was FMP or control group. The moderating effect of FMP versus control group was examined on the association of perfectionism dummy variables with stress and each health outcome, the association of stress with each health outcome, and the indirect association of perfectionism dispositions with health outcomes through stress. All PROCESS models controlled for age and sex. Variables were linearly related, normally distributed, and assumptions of statistical tests were met. Statistical significance was set at  $p < .05$ .

## **Results**

### **Descriptive Statistics**

A greater proportion of FMP ( $n = 36$ ; 40%) than controls ( $n = 34$ ; 28%) were classified as high PS/PC. A lesser proportion of FMP ( $n = 11$ ; 12%) than controls ( $n = 22$ ; 18%) were classified as high PS/low PC, and the same was true for low PS where FMP ( $n = 42$ ; 47%) showed a lesser proportion than controls ( $n = 67$ ; 55%). None of these differences across FMP and controls were statistically significant ( $\chi^2 = 4.11$ ,  $p = .13$ ). As compared to controls, FMP showed higher stress and lower mental and physical health (see Table 2). For

the associations between perfectionism, stress, and health outcomes, high PS/PC was related to more stress for both FMP and controls and for FMP high PS/PC was related to poorer mental but not physical health (see Table 3). Stress was more consistently and strongly related to health outcomes for FMP than controls and health outcomes were inter-correlated in both FMP and controls (see Table 3).

### **Direct Associations of Perfectionism with Health Outcomes**

Moderated mediation model results are in Figure 1. Direct associations of perfectionism variables with health outcomes were observed for FMP in the high PS/PC group who showed poorer mental and physical health, as compared to the low PS group. Although these same direct associations were not present for controls for mental and physical health, the size of these associations in FMP and controls did not differ for mental ( $\beta = -.02, p = .70$ ) or physical health ( $\beta = .02, p = .56$ ). FMP in the high PS/low PC group showed poorer physical health, as compared to the low PS group, and the difference in the size of this association was significantly larger for FMP as compared to controls ( $\beta = -.09, p < .05$ ).

### **Direct Associations of Perfectionism with Stress**

A direct association was observed for FMP and controls in the high PS/PC group who showed a significantly higher level of stress, as compared to the low PS group. Though the size of the association was almost two times greater for FMP than controls, the difference in the magnitude of the association for FMP and controls was not significant ( $\beta = -.10, p = .62$ ). A direct association was not observed for FMP and controls in the high PS/low PC group who showed equal levels of stress, as compared to the low PS group.

### **Direct Associations of Stress with Health Outcomes**

The association of stress with mental and physical health was significant for FMP. The association of stress with mental health and physical health was also significant for controls. The associations between stress and mental health ( $\beta = -.12, p < .05$ ) were all

significantly different in size when comparing FMP with controls, and the difference in the size of associations approached significance for physical health ( $\beta = -.07, p = .09$ ). In every case stress was more strongly related to health outcomes for FMP as compared to controls.

### **Indirect and Moderated Indirect Effects**

In FMP, being in the high PS/PC group was indirectly associated with poorer mental health ( $\beta = -.24, p < .05$ ) and physical health ( $\beta = -.10, p < .05$ ) through the mechanism of stress. For controls, this same indirect association of high PS/PC through stress with mental health ( $\beta = -.08, p < .05$ ) was significant, but it was not so for physical health ( $\beta = -.02, p > .05$ ). The statistical tests of moderated mediation showed that in the cases of both mental ( $\beta = -.16, p < .05$ ) and physical ( $\beta = -.08, p < .05$ ) health the indirect associations were significantly larger in FMP than in controls.

### **Discussion**

The SCCAMPI (Molnar & Sirois, 2016) posits that both PC and PS confer increased vulnerability for poor health-related outcomes in the context of chronic illness. Similarly, the tripartite model of perfectionism (Rice & Ashby, 2007) proposes that perfectionism dispositions characterized by high PS/PC confer the greatest risk for poor adjustment compared to high PS/low PC, and low PS. The current findings are generally consistent with these perspectives. In support of the tripartite model, those in the high PS/PC group reported higher levels of stress, and poorer mental and physical health, relative to the high PS/low PC and low PS groups, for the combined FMP and control groups. In support of the SCCAMPI, high PS/PC was significantly associated with poorer mental and physical health for those with fibromyalgia, but not for the healthy controls. Importantly, the indirect effects of high PS/PC on physical and mental health through stress were significant and larger for the FMP compared to the controls, supporting the SCCAMPI hypothesis that higher stress explains the poor health-outcomes for perfectionists with chronic illness relative to those who are healthy

(Molnar & Sirois, 2016). There was also evidence that high PS alone was detrimental for physical health in comparison to low PS, and that this association was stronger for the FMP.

The current study advances the ongoing debate about whether and when PS may be unhealthy or healthy (e.g., Bieling, Israeli, & Antony, 2004; Stoeber & Otto, 2006), in several important ways. First, this study replicates and extends evidence supporting the conceptualization of high PS/PC as “unhealthy perfectionism” proposed by the tripartite model (Rice & Ashby, 2007). With respect to mental health, the current findings are consistent with previous work which found that high PC/PS was associated with higher negative emotionality relative to other perfectionism groups (Smith et al., 2015). However, the current study extends this evidence by also finding that those in the “unhealthy perfectionism” group report higher stress regardless of their health status, and that this perfectionism disposition was associated with poorer physical health for individuals living with a chronic health condition.

Second, the current study provides valuable evidence highlighting the importance of context when evaluating the extent to which PS may confer risk for health-related outcomes. Previous work has noted that high levels of PS or PC were associated with poor health functioning in women with fibromyalgia, and that either of these perfectionism dimensions creates immense pressure that can compromise adjustment (Molnar, Flett, et al., 2012). Our findings further suggest that it may be the dynamic and mutually reinforcing combination of constant striving to reach goals (high PS) that may no longer be realistic given the functional limitations of fibromyalgia, coupled with self-critical responses to such lapses (high PC), that creates the most risk for stress, and poor mental and physical health in FMP.

Lastly, in addition to considering the effects of PS in the context of high levels of PC, as suggested by the tripartite model (Rice & Ashby, 2007), our findings support the tenets of the SCCAMPI (Molnar & Sirois, 2016) and suggest that health status is an important

contextual factor to consider. Understanding how PS may or may not create vulnerability for poor health may therefore require assessing its effects conjointly with PC *and* examining these effects across a range of health statuses. For individuals with existing health vulnerabilities, such as living with fibromyalgia, high PS/PC may be particularly detrimental for mental and physical health, whereas these same health risks may not be as evident for individuals who are relatively healthy. Assessing these risks using a comparative approach, as we did in the current study, is one way to address this issue and provide a more complete picture of the health risks associated with PS.

### **Limitations and Future Directions**

Given the cross-sectional study design, the directionality of the relationships of perfectionism with stress, and physical and mental health cannot be addressed. Nonetheless, the proposed directions are consistent with theory (Molnar & Sirois, 2016) and longitudinal work demonstrating that perfectionism dimensions relate to negative changes in stress and mental health over time (Prud'homme et al., 2017). Longitudinal work specifically examining whether high PS/PC predicts changes over time is needed to confirm the current findings. Data regarding time since diagnoses or symptom duration was not collected, and therefore the extent to which these medical status variables contributed to the quality of life and stress variables is unknown. Replicating the findings with other chronic illnesses is also needed to test the extent to which the current findings are generalizable beyond fibromyalgia. Although this is one of the first tests of the SCCAMPI and its underlying assumptions, the four key pathways posited by this model to link perfectionism to higher stress (impoverished social support networks, perceptions of loss of control, negative self-evaluations, and self-concealment) were not tested. Research examining these pathways over time would be well-positioned to elucidate the mechanisms proposed by this model. Nonetheless, the current study is the first, to our knowledge, to use a comparative analysis to test and find support for

the tripartite model in both healthy and chronically ill samples.

### **Conclusion**

Our study provides evidence supporting the value of taking a person-centered approach for understanding how PS may create vulnerability for poor health in the context of chronic illness. In support of both the tripartite model of perfectionism (Rice & Ashby, 2007) and the SCCAMPI (Molnar & Sirois, 2016), the within-person combination of high PS/PC was associated with poorer health-related outcomes compared to the high PS/low PC and low PS groups, and for most outcomes, these associations were more robust for FMP compared to the healthy control group. Further research with other illness groups is warranted to further understand how PS may exacerbate stress and poor health for those living with a chronic illness.

## References

- Bieling, P. J., Israeli, A. L., & Antony, M. M. (2004). Is perfectionism good, bad, or both? Examining models of the perfectionism construct. *Personality and Individual Differences, 36*(6), 1373-1385. doi:10.1016/s0191-8869(03)00235-6
- Center for Disease Control and Prevention (2017). Fibromyalgia fact sheet. Retrieved from <https://www.cdc.gov/arthritis/basics/fibromyalgia.htm>
- Coppens, E., Kempke, S., Van Wambeke, P., Claes, S., Morlion, B., Luyten, P., & Van Oudenhove, L. (in press). Cortisol and subjective stress responses to acute psychosocial stress in fibromyalgia patients and control participants. *Psychosomatic Medicine*. doi:10.1097/psy.0000000000000551
- Dunkley, D. M., Blankstein, K. R., Halsall, J., Williams, M., & Winkworth, G. (2000). The relation between perfectionism and distress: Hassles, coping, and perceived social support as mediators and moderators. *Journal of Counseling Psychology, 47*, 437-453.
- Eddington, K. M. (2013). Perfectionism, goal adjustment, and self-regulation: A short-term follow-up study of distress and coping. *Self and Identity, 13*(2), 197-213.
- Flett, G. L., Baricza, C., Gupta, A., Hewitt, P. L., & Endler, N. S. (2011). Perfectionism, psychosocial impact and coping with irritable bowel disease: A study of patients with crohn's disease and ulcerative colitis. *Journal of Health Psychology, 16*(4), 561-571. doi:10.1177/1359105310383601
- Fliege, H., Rose, M., Arck, P., Levenstein, S., & Klapp, B. F. (2001). Validierung des "Perceived Stress Questionnaire" (PSQ) an einer deutschen Stichprobe. *Diagnostica, 47*(3), 142-152. doi:10.1026//0012-1924.47.3.142
- Frost, R. O., Heimberg, R. G., Holt, C. S., Mattia, J. I., & Neubauer, A. L. (1993). A comparison of two measures of perfectionism. *Personality and Individual Differences, 14*(1), 119-126. doi:[http://dx.doi.org/10.1016/0191-8869\(93\)90181-2](http://dx.doi.org/10.1016/0191-8869(93)90181-2)

- Frost, R. O., Marten, P. A., Lahart, C., & Rosenblate, R. (1990). The dimensions of perfectionism. *Cognitive Therapy and Research, 14*, 449-468.
- Gaudreau, P., & Thompson, A. (2010a). Testing a 2 X 2 model of dispositional perfectionism. *Personality and Individual Differences, 48*(5), 532-537.  
doi:<http://dx.doi.org/10.1016/j.paid.2009.11.031>
- Levenstein, S., Prantera, C., Varvo, V., Scribano, M. L., Berto, E., Luzi, C., & Andreoli, A. (1993). Development of the perceived stress questionnaire: A new tool for psychosomatic research. *Journal of Psychosomatic Research, 37*(1), 19-32.  
doi:[http://dx.doi.org/10.1016/0022-3999\(93\)90120-5](http://dx.doi.org/10.1016/0022-3999(93)90120-5)
- Molnar, D. S., Flett, G. L., Sadava, S. W., & Colautti, J. (2012). Perfectionism and health functioning in women with fibromyalgia. *Journal of Psychosomatic Research, 73*(4), 295-300. doi:<https://doi.org/10.1016/j.jpsychores.2012.08.001>
- Molnar, D. S., Sadava, S. W., Flett, G. L., & Colautti, J. (2012). Perfectionism and health: A mediational analysis of the roles of stress, social support and health-related behaviours. *Psychology & Health, 27*(7), 846-864.  
doi:10.1080/08870446.2011.630466
- Molnar, D. S., & Sirois, F. M. (2016). Trying to be perfect in an imperfect world: Examining perfectionism in the context of chronic illness. In F. M. Sirois & D. S. Molnar (Eds.), *Perfectionism, Health and Well-being* (pp. 69-100). Switzerland: Springer.
- National Fibromyalgia Association. (2017). Prevalence. Retrieved from <http://www.fmaware.org/about-fibromyalgia/prevalence>
- Prud'homme, J., Dunkley, D. M., Bernier, E., Berg, J.-L., Gheleterter, A., & Starrs, C. J. (2017). Specific perfectionism components predicting daily stress, coping, and negative affect six months and three years later. *Personality and Individual Differences, 111*, 134-138. doi:<https://doi.org/10.1016/j.paid.2017.01.034>

- Rice, K. G., & Ashby, J. S. (2007). An efficient method for classifying perfectionists. *Journal of Counseling Psychology, 54*, 72-85.
- Shanmugasegaram, S., Flett, G. L., Madan, M., Oh, P., Marzolini, S., Reitav, J., . . . Sturman, E. D. (2014). Perfectionism, Type D personality, and illness-related coping styles in cardiac rehabilitation patients. *Journal of Health Psychology, 19*(3), 417-426.  
doi:10.1177/1359105312471571
- Sirois, F. M., & Molnar, D. S. (2016). Conceptualizations of perfectionism, health, and well-being: An introductory overview. In F. M. Sirois & D. S. Molnar (Eds.), *Perfectionism, Health and Well-being* (pp. 45-68). Switzerland: Springer.
- Sirois, F. M., & Molnar, D. S. (2017). Perfectionistic strivings and concerns are differentially associated with self-rated health beyond negative affect. *Journal of Research in Personality, 70*, 73-83. doi:<https://doi.org/10.1016/j.jrp.2017.06.003>
- Sirois, F. M., Monforton, J., & Simpson, M. (2010). "If only I had done better": Perfectionism and the functionality of counterfactual thinking. *Personality and Social Psychology Bulletin, 36*, 1675-1692.
- Smith, M. M., Saklofske, D. H., Yan, G., & Sherry, S. B. (2015). Perfectionistic strivings and perfectionistic concerns interact to predict negative emotionality: Support for the tripartite model of perfectionism in Canadian and Chinese university students. *Personality and Individual Differences, 81*, 141-147.  
doi:<https://doi.org/10.1016/j.paid.2014.09.006>
- Stoeber, J. (1995). *Frost Multidimensional Perfectionism Scale-Deutsch (FMPS-D)*. Freie Universität Berlin, Institut für Psychologie.
- Stoeber, J., & Corr, P. J. (2016). A short empirical note on perfectionism and flourishing. *Personality and Individual Differences, 90*, 50-53.  
doi:<https://doi.org/10.1016/j.paid.2015.10.036>

- Stoeber, J., & Otto, K. (2006). Positive conceptions of perfectionism: Approaches, evidence, challenges. *Personality and Social Psychology Review, 10*, 295-319.
- Van Houdenhove, B., Egle, U., & Luyten, P. (2005). The role of life stress in fibromyalgia. *Current Rheumatology Reports, 7*(5), 365-370. doi:10.1007/s11926-005-0021-z
- Ware, J. E., Keller, S. D., & Kosinski, M. (1998). *SF-12: How to Score the SF-12 Physical and Mental Health Summary Scales*. Lincoln, RI: QualityMetric Incorporated.
- Wolfe, F., Clauw, D. J., Fitzcharles, M.-A., Goldenberg, D. L., Katz, R. S., Mease, P., . . . Yunus, M. B. (2010). The American College of Rheumatology Preliminary Diagnostic Criteria for Fibromyalgia and Measurement of Symptom Severity. *Arthritis Care & Research, 62*(5), 600-610. doi:10.1002/acr.20140

Table 1

## Socio-Demographic Summary Statistics for Fibromyalgia Patients and Controls

	Patients	Controls	F/ $\chi^2$
Age in years <sup>1</sup>	57 (10.4)	44 (17)	46.48***
Gender (female/male) <sup>2</sup>	96/1	110/13	8.28**
Religion <sup>2</sup>			.18
Christian	85	110	
No religion	12	13	
Marital status <sup>2</sup>			22.81***
Married	63	62	
Living with partner	5	11	
Divorced	6	5	
Single	11	42	
Widowed	10	2	
Education (years) <sup>2</sup>			59.94***
9 or less	42	14	
10 or 11	42	35	
12 or more	8	68	
Advanced	6	6	

<sup>1</sup>Mean (standard deviation) and *F*-test; <sup>2</sup>*N* and Chi-square test. \*\*  $p < .01$ , \*\*\*  $p < .001$

Table 2

Means, Standard Errors, and Significance of Difference Between Fibromyalgia Patients and Controls

	FMS Patients		Controls		<i>t</i>	<i>d</i>
	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>		
Stress	50.43	0.75	44.05	0.61	6.66***	.90
Mental Health	37.10	1.11	51.55	0.78	-10.94***	-1.05
Physical Health	30.42	0.82	52.90	0.64	-21.99***	-3.02

\*\*\*  $p < .001$

Table 3

Bivariate Correlations for Perfectionism Dispositions, Stress, and Health Outcomes for Fibromyalgia Patients (above diagonal) and Healthy Controls (below diagonal)

	1	2	3	4	5
1. High strivings/High Concerns	--	-.32***	.41***	-.33***	-.16
2. High strivings/Low Concerns	-.29***	--	-.06	.04	-.20
3. Stress	.25**	-.07	--	-.63***	-.35***
4. Mental Health	-.12	.15	-.42***	--	.21*
5. Physical Health	-.16	.08	-.17	.06	--

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

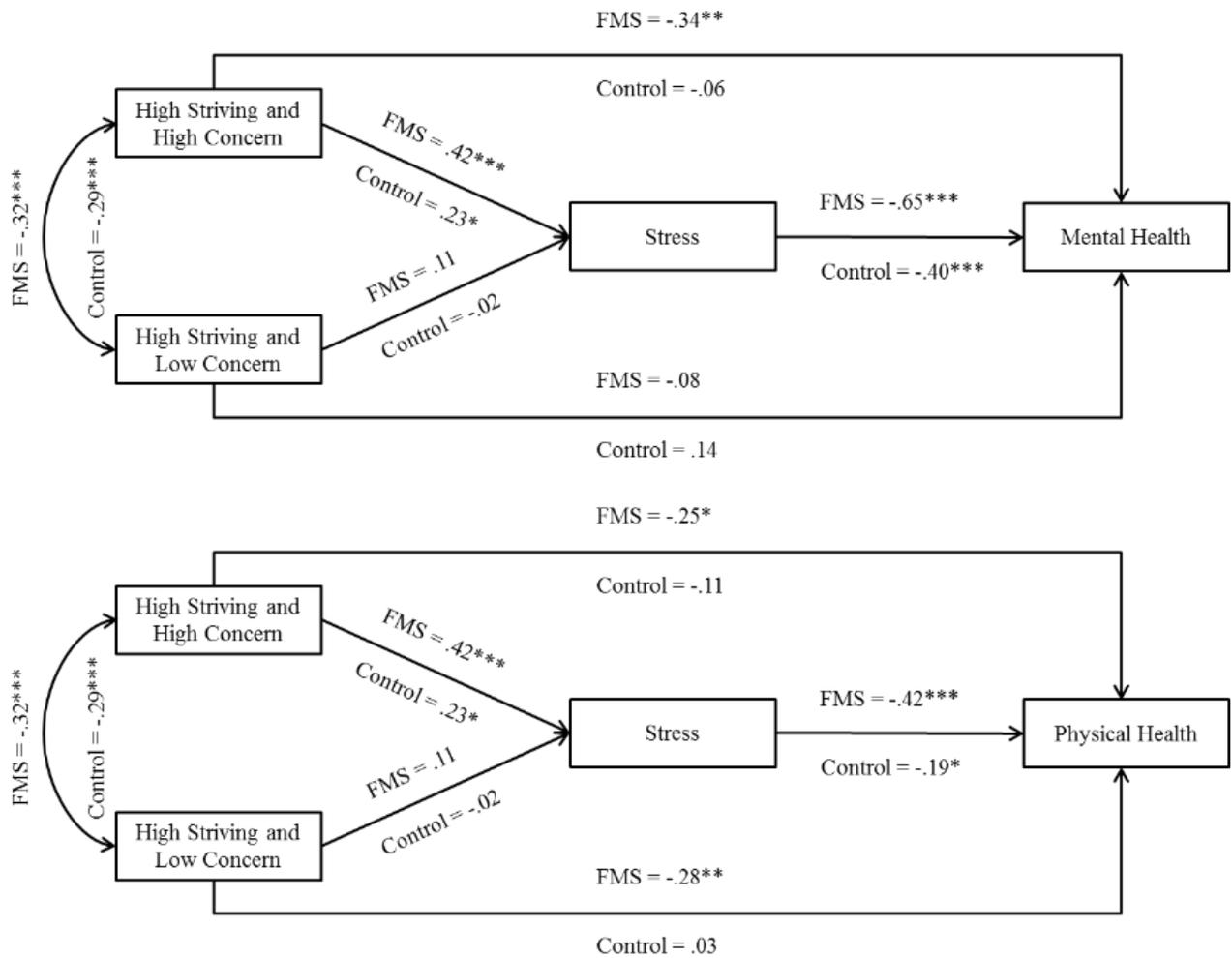


Figure 1. Top path diagram shows direct and indirect associations, through stress, of perfectionism with mental health for both fibromyalgia (FMS) patients and controls. Bottom path diagram shows direct and indirect associations, through stress, of perfectionism with physical health for both fibromyalgia (FMS) patients and controls. All coefficients are standardized and adjusted for age and sex. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .