A mediational model of perfectionistic automatic thoughts and psychosomatic symptoms: The roles of negative affect and daily hassles

Gordon L. Flett [a,*], Danielle S. Molnar [a], Taryn Nepon [a], Paul L. Hewitt [b]

[a] York University, 4700 Keele Street, Toronto, Ontario, M3J 1P, Canada
[b] Department of Psychology, University of British Columbia, 2136 West Mall, Vancouver, BC V6T 1Z4, Canada

ABSTRACT

The current study extended research linking trait perfectionism with health symptoms by examining perfectionism from a cognitive perspective focused on perfectionistic automatic thoughts in psychosomatic symptoms. It was postulated that a cognitive preoccupation with needing to be perfect is a specific form of rumination implicated in health problems. In addition, we evaluated daily hassles and negative affect as possible mediators of the link between perfectionistic automatic thoughts and psychosomatic symptoms. A sample of 228 participants completed the Perfectionism Cognitions Inventory and measures of daily hassles, positive affect, negative affect, and psychosomatic symptoms. As expected, perfectionistic automatic thoughts were linked significantly with psychosomatic symptoms, daily hassles, and trait negative affect. Tests of mediational effects indicated that daily hassles and negative affect mediated the link between perfectionistic automatic thoughts and psychosomatic symptoms and this pattern held for both men and women. The results indicate that people with frequent thoughts about needing to be perfect are susceptible to experiencing more frequent psychosomatic symptoms and should benefit from stress reduction training and cognitive-behavioral interventions focused on reducing these thoughts.

1. Introduction

A growing theme in the perfectionism field is the association between perfectionism and health symptoms. Associations between perfectionism and both general and specific health symptoms have been detected primarily in college and university students (e.g., Bottos & Dewey, 2004; Martin, Flett, Hewitt, Krames, & Szanto, 1996). Other research has established links between trait perfectionism and health symptoms in adults from the general population (e.g., Molnar, Reker, Culp, Sadava, & DeCourville, 2006; Saboonchi & Lundh, 2003). Additional data indicate that perfectionism can predict increases in health symptoms and negative health outcomes (Prichard, Wilson, & Yamnitz, 2007; Sumi & Kanda, 2002). The long-term implications of health problems among perfectionists were illustrated by Fry and Debats (2009). Their longitudinal study established that trait perfectionism predicted early mortality after controlling for other well-known personality predictors of health problems, such as conscientiousness and neuroticism.

Research on perfectionism and health has focused primarily on trait perfectionism as assessed by inventories that share the same name – the Multidimensional Perfectionism Scale (Frost, Marten, La-hart, & Rosenblate, 1990; Hewitt & Flett, 1991). Unfortunately, other potentially relevant conceptualizations of perfectionism have not been investigated. The current study focused uniquely on individual differences in the frequency of ruminative, automatic thoughts reflecting the need to be perfect. Specifically, we maintain that a cognitive preoccupation with perfectionism (i.e., obsessive ruminations) sets the stage for health problems. This would be in keeping with general evidence linking negative automatic thoughts and ruminative brooding with health problems and a heightened stress response (e.g., Burg & Abrams, 2001; Key, Campbell, Bacon, & Gerin, 2008). Indeed, there is growing evidence for the *perseverative cognition hypothesis*, which is the notion that rumination prolongs the stress response, thus contributing to health problems (see Verkuil, Brosschot, Gebhardt, & Thayer, 2011).

Flett, Hewitt, Blankstein, and Gray (1998) developed the Perfectionism Cognitions Inventory (PCI) to assess automatic thoughts reflecting the need to be perfect. The PCI reflects the premise that perfectionists who sense a discrepancy between their actual self and their ideal self, or between their actual level of attainment and their exceptionally high goals will experience thoughts that reflect perfectionistic themes (e.g., I must be perfect). The PCI assesses the frequency of perfectionistic thoughts from "... a unique cognitive perspective" (Enns & Cox, 2002, p. 50). Numerous studies have confirmed that perfectionistic automatic thoughts account for unique variance in psychological distress unaccounted for by existing trait measures of perfectionism (Flett, Hewitt,

* Corresponding author. Address: Dept. of Psychology, York University, 214 BSB, 4700 Keele Street, Toronto, Ontario, Canada M3J 1P3.
E-mail address: gflett@yorku.ca (G.L. Flett).

Whelan, & Martin, 2007; Flett et al., 1998). It is also linked with deficits in cognitive-emotion regulation and cognitive self-management (see Flett et al., 2007; Rudolph, Flett, & Hewitt, 2007).

As a personality-specific form of repetitive thinking, frequent perfectionistic thoughts should play a substantial role in psychosomatic symptoms. Chronic awareness of not being perfect while still feeling compelled and needing to achieve this essential personal goal should be a chronic source of stress and distress for certain perfectionists that should be reflected eventually by a heightened experience of psychosomatic symptoms. Perfectionists who chronically experience thoughts about their needs to be perfect and shortfalls cannot disengage, either cognitively or emotionally from their unattainable goal of being perfect, so they should be quite susceptible to dysphoria and psychosomatic symptoms. Accordingly, the current study assessed the proposed association between perfectionistic automatic thoughts and psychosomatic symptoms, but also evaluated possible mechanisms that likely contribute to this proposed association with psychosomatic symptoms.

We tested a mediational model in which daily hassles and affect mediated the link between perfectionistic automatic thoughts and psychosomatic symptoms. First, in keeping with theoretical accounts that link perfectionism with stress reactivity and stress generation (see Hewitt & Flett, 1991, 2002), it follows that people experiencing frequent perfectionistic thoughts will experience psychosomatic symptoms to the extent that they are experiencing significant stress. Perfectionists exposed to stress tend to have health-related reactions (Dittner, Rimes, & Thorpe, 2011). Perfectionists with chronic rumination who experience stress should be prone to experiencing more stress-related health problems, in part, because of the perfectionist's need for control and tendency to react in a maladaptive manner to failures and setbacks (see Flett, Hewitt, Blankstein, & Mosher, 1995). Given that general research on perfectionism and depression has found stress to be a significant mediator (e.g., Dunkley & Blankstein, 2000), it follows that stress should also mediate the link between perfectionistic automatic thoughts and psychosomatic symptoms. The present work examined this possibility in students with a daily hassles measure designed specifically for students.

We also tested the roles of negative affect and positive affect as mediators. Molnar et al. (2006) summarized past work showing the consistent link between a preponderance of negative affect and health problems (e.g., Cohen & Rodriguez, 1995; Leventhal, Hansell, Diefenbach, Leventhal, & Glass, 1996) and postulated that perfectionism dimensions would be associated with health symptoms through a link with high negative affect and low positive affect. Molnar et al. (2006) found that a preponderance of high trait negative affect and low positive affect fully mediated the link between self-oriented perfectionism and health symptoms and partially mediated the link between socially prescribed perfectionism and health symptoms. This model can also be applied to the proposed model of perfectionistic automatic thoughts and psychosomatic symptoms given that the PCI is associated robustly with negative affect (see Flett et al., 1998). Consistent with Molnar et al. (2006), we focused on trait affect instead of state affect given growing evidence of the role of trait negative affect in health problems (Bleil, Gianaros, Jennings, Flory, & Manuck, 2008; Denollet, Schiffer, & Spek, 2010) and our contention that it is chronic negative affect that puts perfectionists at risk.

In summary, we hypothesized that perfectionistic automatic thoughts would be linked with experiencing more frequent psychosomatic symptoms and that both daily hassles and negative affect would mediate the link between perfectionistic automatic thoughts and psychosomatic symptoms. These associations were assessed while statistically accounting for the effects of broader personality traits related to perfectionism and psychosomatic symptoms (i.e. neuroticism, conscientiousness, and extraversion).

2. Method

2.1. Participants and procedures

A total of 228 university students (157 women, 71 men) with a mean age of 18.9 years ($SD = 2.3$) were recruited. First-year students took part in a larger project examining adjustment and general health among individuals making the transition to university. Participants were approached initially during the first 6 weeks of the fall semester and again in the month of February. The current data are from this second assessment. Participants were paid $10 for their participation at Time 2. Overall, approximately 75% of the participants had completed high school during the previous year and about 75% of the participants were currently living at home.

2.2. Measures

The following measures were administered.

2.2.1. Perfectionism Cognitions Inventory (PCI; Flett et al., 1998)

The PCI is a 25-item measure of the frequency over the past week of automatic thoughts indicating the need to achieve perfection such as "Why cannot I be perfect?" The PCI has demonstrated high internal consistency in student and clinical samples (Flett et al., 1998, 2007). The validity of the measure is indicated by its association with conceptually relevant measures (see Flett, Greene, & Hewitt, 2004; Flett et al., 2007).

2.2.2. Ten-Item Personality Inventory (TIPI; Gosling, Rentfrow, & Swann, 2003)

The TIPI is a brief scale assessing the Big-Five personality dimensions with two items per subscale. For the purposes of the present study, we only used the dimensions of extraversion (e.g., "extraverted, enthusiastic"), conscientiousness (e.g., "dependable, self-disciplined"), and emotional stability (e.g., "calm, emotionally stable"). We reverse scored the emotional stability dimension and labeled it as "neuroticism". The TIPI demonstrated sufficient convergent and discriminant validity in a sample of 1813 university students (Gosling et al., 2003).

2.2.3. Positive Affect and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988)

The PANAS has 10 adjectives assessing trait positive affect (e.g., "excited") and trait negative affect (e.g., "upset"). Participants rated positive and negative emotions/feelings 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). Scores on the PANAS have demonstrated high test–retest reliability and acceptable convergent validity in terms of its correlations with similar measures of distress (Watson et al., 1988).

2.2.4. Inventory of College Students' Recent Life Experiences (ICSRLE; Kohn, Lafreniere, & Gurevich, 1990)

The ICSRLE is a 49-item questionnaire measuring daily life hassles among university students. Respondents rate the extent to which a particular experience has been a part of their lives over the past month. Items are scored according to a Likert scale ranging from 1 (Not at all part of my life) to 4 (Very much part of my life). Seven factors have been identified: developmental challenge (e.g., "Struggling to meet your own academic standards"); time pressure (e.g., "Too many things to do at once"); academic alienation (e.g., "Disliking your studies"); romantic problems (e.g., "Conflicts with boyfriend/girlfriend/spouse"); assorted annoyances (e.g., "Gossip

concerning someone you care about"); general social mistreatment (e.g., "Social isolation"); and friendship problems (e.g., "Being let down or disappointed by friends"). We only examined total scores. The ICSRLE has good internal consistency, with alpha coefficients of .88 and .89 in two different samples (Kohn et al., 1990). This measure has been used in numerous contexts.

2.2.5. SUNYA Revision of the Psychosomatic Symptom Checklist (PSC; Attanasio, Andrasik, Blanchard, & Arena, 1984)

The PSC measures 17 psychosomatic symptoms (e.g., headaches, fatigue, dizziness). Respondents rate the frequency and intensity of the symptoms. However, we examined only the frequency scores, which is scored on a Likert scale, with the following response options: 0 (not a problem), 1 (occurs about once a month), 2 (occurs about once a week), 3 (occurs several times a week), and 4 (occurs daily). Possible scores can range between 0 and 68. This instrument has demonstrated reliability and validity in a sample of 698 university students (Attanasio et al., 1984). The PSC predicts treatment success for pediatric migraine (Herman, Blanchard, & Flor, 1997) and is sensitive to different treatments for tension headache in college students (Holroyd, Andrasik, & Noble, 1980).

3. Results

3.1. Data analysis

Using AMOS version 18 software (Arbuckle, 2008) and maximum likelihood estimation, path analysis was conducted to test the model displayed in Fig. 1. Specifically, psychosomatic symptoms were regressed simultaneously onto perfectionistic automatic thoughts, along with each of the variables from the three hypothesized intervening pathways (i.e., positive and negative affect, and daily hassles) and higher-order personality traits related to both perfectionistic automatic thoughts and psychosomatic symptoms (i.e., extraversion, conscientiousness, and neuroticism). Moreover, each pathway variable was regressed simultaneously onto perfectionistic automatic thoughts, extraversion, conscientiousness, and neuroticism. Correlations were specified between each pair of residuals for the pathway variables and between each of the exogenous variables.

The total, direct, and indirect effects of perfectionistic automatic thoughts on psychosomatic symptoms were estimated, along with

direct effects of perfectionistic automatic thoughts on the three pathway variables, and direct effects of these latter variables on psychosomatic symptoms. Because the path model was saturated (i.e., $df = 0$), fit indices were uninformative. Consequently, of primary interest was the decomposition of the total predictive effects of perfectionistic automatic thoughts on psychosomatic symptoms into direct and indirect effects (see MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). Corresponding p-values for each effect were bias-corrected estimates derived from 1000 bootstrap samples (Shrout & Bolger, 2002).

Finally, we undertook a test of invariance between men and women. Model fit indices were compared between a path model in which all predictive paths were freely estimated within sex groups, and a constrained model in which corresponding predictive paths were set equal across sexes. Small, nonsignificant changes in the model fit indices would indicate that the assumption of equality in corresponding predictive paths across sex groups is tenable (Kline, 1998).

3.2. Correlational analyses

Table 1 includes the means, standard deviations, and internal consistencies for all of the variables. Correlations among the measures are presented in Table 2. As expected, having more frequent perfectionistic automatic thoughts was associated significantly with psychosomatic symptoms. PCI scores were also correlated positively with negative affect and stress, but not with positive affect. Negative affect, positive affect, and daily hassles were moderately intercorrelated and each correlated significantly with psychosomatic symptoms. Finally, neuroticism was associated with higher levels of perfectionistic automatic thoughts, hassles, negative affect, and psychosomatic symptoms, and with lower positive affect. Extraversion was linked with fewer daily hassles and more frequent positive affect. Conscientiousness was associated negatively with daily hassles, negative affect, and psychosomatic symptoms, and more frequent positive affect.

3.3. Path analyses

Results from the path model are shown in Fig. 2. The implied total, direct, and indirect effects were tested using 1000 bootstrap samples and the bias corrected bootstrap method with the 95% confidence intervals. Results revealed that after accounting for the
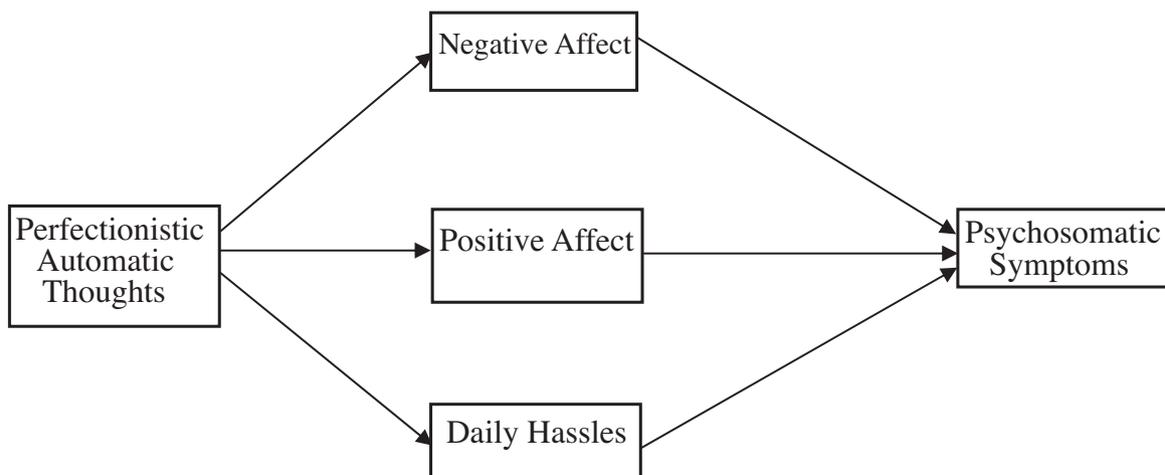

Fig. 1. Hypothesized mediated model of perfectionistic automatic thoughts, affect, daily hassles, and psychosomatic symptoms. *Notes*: The effects of conscientiousness, extraversion, and neuroticism were accounted for in model testing, but are not shown here for ease of presentation. Likewise, error terms and covariances among the error terms of the pathway variables have been omitted from the figure for ease of presentation.

Table 1
Means, standard deviations, and alpha coefficients for the measures.

Variables	M	SD	Alphas
PCI	41.56	22.44	.95
ICSRLE	98.17	23.39	.93
Positive affect	31.93	7.47	.86
Negative affect	21.62	8.12	.88
PSC	26.13	20.14	.88
Neuroticism	7.13	2.74	–
Extraversion	9.02	2.71	–
Conscientiousness	10.34	2.58	–

Notes: The abbreviations are as follows: PCI = Perfectionism Cognitions Inventory; ICSRLE = Inventory of College Students' Recent Life Experiences; and PSC = SUNYA Revision of the Psychosomatic Symptom Checklist.

effects of extraversion, conscientiousness, and neuroticism, perfectionistic automatic thoughts had significant, positive, total effects on psychosomatic symptoms ($B = 0.30$; 95% CI = .17–.42, $p < .01$). While the direct effects of perfectionistic automatic thoughts were not statistically significant ($B = .09$; 95% CI = −.06–.20, $p = .23$), indirect effects were significant and positive ($B = 0.21$; 95% CI = .08–.36, $p < .01$). From Fig. 2, it is clear that the relation between perfectionistic automatic thoughts and psychosomatic symptoms was accounted for by negative affect and daily hassles. Model fit indices did not change significantly when corresponding predictive paths ($\Delta\chi^2 = 18.41$ df = 19, $p = .50$; ΔCFI < .001; ΔRMSEA < .001), structural covariances ($\Delta\chi^2 = 33.30$ df = 29, $p = .27$; ΔCFI = .009; ΔRMSEA = .026), and structural residuals ($\Delta\chi^2 = 38.12$ df = 36,

$p = .37$; ΔCFI = .004; ΔRMSEA < .016) were constrained to be equal across sexes. Therefore, the assumption of equality across sex groups was tenable. Further, changing estimation from ML to ADF did not have a significant impact on the results.

4. Discussion

The present study yielded the first empirical evidence indicating that frequent perfectionistic automatic thoughts are associated with experiencing more frequent psychosomatic symptoms. Thus, the current results extend past research showing that certain trait perfectionism dimensions are associated with self-reported psychosomatic symptoms (e.g., Martin et al., 1996; Molnar et al., 2006). We also found that the PCI was associated with higher levels of daily hassles. Because this is a cross-sectional study, it cannot be assumed that perfectionistic automatic thoughts caused more frequent psychosomatic symptoms and daily hassles, and indeed, it is quite possible that perfectionistic automatic thoughts operate in a complex bidirectional sequence.

Subsequent mediational tests confirmed that the association between perfectionistic automatic thoughts and psychosomatic symptoms is due substantially to the link that perfectionistic automatic thoughts has with negative affect and daily hassles. The direct association between the PCI and psychosomatic symptoms was no longer evident once the mediational roles of daily hassles and negative affect were incorporated. Clearly, future research must examine specific forms of negative affect and examine their

Table 2
Correlations between the all model variables.

Variables	1	2	3	4	5	6	7	8
1. PCI	–							
2. ICSRLE	.51**	–						
3. Positive affect	−.02	−.36**	–					
4. Negative affect	.47**	.64**	−.41**	–				
5. PSC	.41**	.55**	−.20**	.50**	–			
6. Neuroticism	.30**	.39**	−.29**	.42**	.44**	–		
7. Extraversion	−.08	−.14*	.21**	−.08	−.12	−.24**	–	
8. Conscientiousness	−.12	−.23**	.33**	−.30**	−.20**	−.23**	.15*	–

Notes: $^*p < .05$, $^{**}p < .01$, two-tailed. The abbreviations are as follows: PCI = Perfectionism Cognitions Inventory; ICSRLE = Inventory of College Students' Recent Life Experiences; and PSC = SUNYA Revision of the Psychosomatic Symptom Checklist.
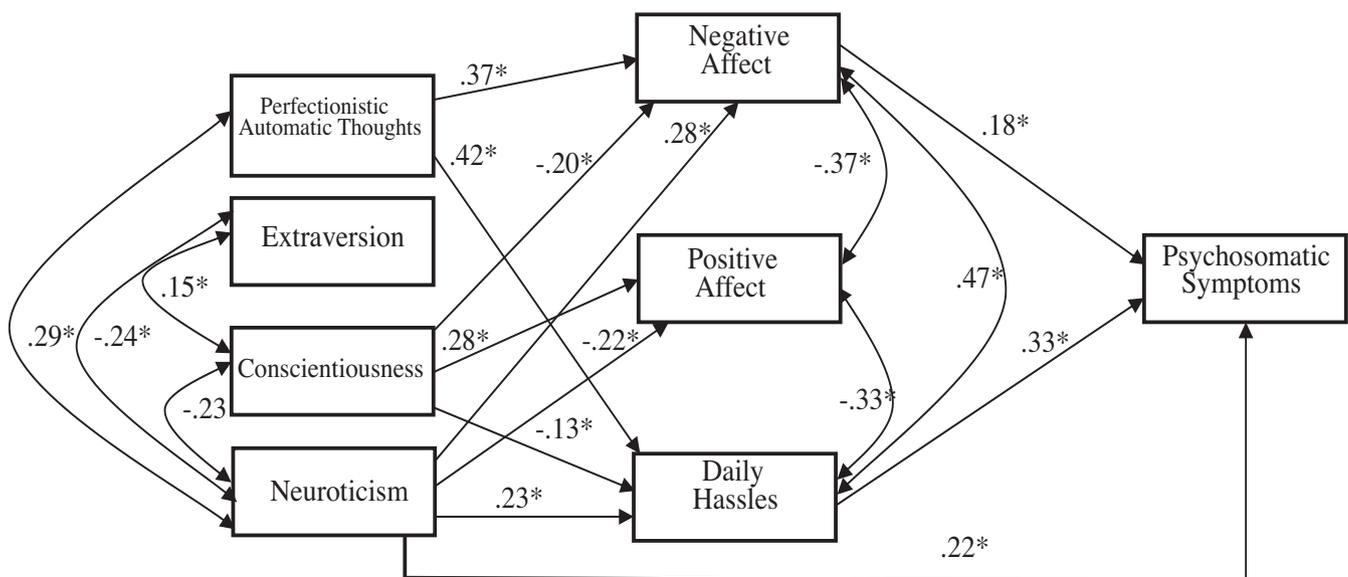

Fig. 2. Final mediated model of perfectionistic automatic thoughts and psychosomatic symptoms accounting for the effects of conscientiousness, extraversion, and neuroticism. *Notes*: Error terms are not displayed for ease of presentation. Only statistically significant paths are shown.

relative roles in this model. Self-conscious emotions such as shame should be explored, given the link between perfectionism and shame (see Tangney, 2002) and the role of shame in health problems (see Dickerson, Gruenwald, & Kemeny, 2004).

The present study tested three hypothesized pathways linking perfectionistic automatic thoughts to psychosomatic symptoms. While these pathways have been theorized in the literature, the present work was the first to simultaneously examine all three intervening pathways. While all of the pathway variables were correlated significantly with psychosomatic symptoms, only daily hassles and negative affect were associated with psychosomatic symptoms in the pathway model. These results could be interpreted from a statistical standpoint as reflecting multicollinearity among the multiple pathways, such that the variability that each pathway variable accounted for in psychosomatic symptoms overlapped to some degree, and when the shared variability among the pathway variables was reflected in the model, the unique associations between daily hassles and psychosomatic symptoms and between negative affect and psychosomatic symptoms were more robust and consistent compared to the other unique associations.

Our results showed clearly that daily hassles represent an important pathway linking PCI scores and psychosomatic symptoms. Thus, it seems quite plausible that it is the experience of daily stress that contributes to perceived symptom frequency among ruminating perfectionists. This is generally in keeping with physiological evidence of a heightened stress response among perfectionists in threatening situations (see Wirtz et al., 2007). Future research in this area can extend the scope of inquiry by examining the role of specific stressors. For instance, regarding the suggested role of shame, social evaluative stressors should be investigated in light of evidence documenting the physiological impact of negative social evaluations in general (Dickerson, Mycek, & Zaldivar, 2008). Perfectionists who are sensitive to social evaluations should be particularly reactive when confronted with this type of stress.

While we did not measure trait perfectionism, we anticipate that future tests of the PCI versus trait perfectionism dimensions in health outcomes will establish a unique role for perfectionistic automatic thoughts due to the inherently stressful nature of thoughts which reflect current setbacks and failures and an awareness at the cognitive level of the discrepancy between the current, actual self and life outcomes versus the perfect, ideal self. That is, a crucial aspect of health problems among perfectionists is the chronic cognitive awareness of mistakes and imperfections in the self that highlight ways in which perfection has not been attained in the present and might not be achieved in the future.

Parenthetically, it is important to underscore that the current results involving perfectionistic automatic thoughts were obtained after statistically accounting for individual differences in other personality traits (i.e., conscientiousness, extraversion, and neuroticism) that have been linked historically with health outcomes. This approach is in keeping with other recent research showing that perfectionism predicts above and beyond variables represented by the five-factor model (see Flett, Baricza, Gupta, Hewitt, & Endler, 2011; Fry & Debats, 2009).

One important practical implication of our results is that interventions are needed for people who chronically experience perfectionistic thoughts. In general, growing evidence suggests that having a perfectionistic personality tends to interfere with the treatment progress of depressed people due to various factors (see Blatt & Zuroff, 2002; Hewitt, Habke, Lee-Baggley, Sherry, & Flett, 2008). Although positive intervention may be difficult, it is not impossible, as indicated by the positive results of recent investigations involving the PCI (see Arpin-Cribbie et al., 2008; Kearns, Forbes, & Gardiner, 2007).

The current study is not without its limitations. First, as noted before, it cannot be assumed from a cross-sectional investigation

that perfectionistic automatic thoughts cause psychosomatic symptoms. Second, the current study relied on self-report measures and future research should examine more objective health outcomes, including physiological indices of health and stress. Finally, it is important to examine perfectionistic automatic thoughts and psychosomatic symptoms in a wide variety of populations.

In summary, the results of this study supported the notion that perfectionistic automatic thoughts are associated with psychosomatic symptoms, as well as with daily hassles and negative affect. In addition, we found that the association between perfectionistic automatic thoughts and psychosomatic symptoms was mediated by daily hassles and negative affect. The current results point to a particular manifestation of perfectionism that is a form of rumination that likely plays a key role in individuals' susceptibility to experiencing psychosomatic symptoms.

Acknowledgment

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