J Rat-Emo Cognitive-Behav Ther (2012) 30:91–104
DOI 10.1007/s10942-011-0131-7

ORIGINAL ARTICLE

Perfectionistic Automatic Thoughts and Psychological Distress in Adolescents: An Analysis of the Perfectionism Cognitions Inventory

Gordon L. Flett · Paul L. Hewitt · Aline Demerjian · Edward D. Sturman · Simon B. Sherry · Winnie Cheng

Published online: 23 March 2011

Abstract The present paper examines a measure of perfectionistic automatic thoughts in terms of its psychometric properties and association with depression in adolescents. The Perfectionism Cognitions Inventory (PCI) was administered to two samples of adolescents. The first sample of adolescents ($N = 250$) also completed measures of trait perfectionism and depression. The second sample of adolescents ($N = 105$) completed these same measures as well as measures of negative automatic thoughts, positive automatic thoughts, self-criticism, and dependency. Psychometric analyses established that the PCI consists of one large factor with a high level of internal consistency. As expected, the PCI in adolescents was correlated significantly with trait measures of perfectionism, self-criticism, dependency, as well as general measures of automatic thoughts. Most importantly, a series of hierarchical regressions established that the PCI accounted for a significant degree of unique variance in depression, over and above the variance attributable to trait personality measures and negative automatic thoughts in general. Overall, the findings suggest perfectionistic automatic thoughts can be assessed in a reliable and

An earlier version of this paper was presented on May 25th, 2007 at the 19th annual convention of the Association For Psychological Science, Washington, DC.

G. L. Flett (✉) · A. Demerjian · W. Cheng
Department of Psychology, York University, 4700 Keele Street, Toronto, ON M3J 1P3, Canada
e-mail: gflett@yorku.ca

P. L. Hewitt
University of British Columbia, Vancouver, BC, Canada

E. D. Sturman
State University of New York at Plattsburgh, Plattsburgh, NY, USA

S. B. Sherry
Dalhousie University, Halifax, NS, Canada

valid manner in adolescents and that the experience of frequent, perfectionistic thoughts contributes uniquely to increased levels of psychological distress.

Keywords Perfectionism · Cognitions · Automatic thoughts · Depression · Self-criticism · Dependency

Introduction

Research and theory continues to explore the role of cognitive factors in psychological distress among young people. General research with children and adolescents has confirmed that there are individual differences in the experience of automatic thoughts and several measures with evident content validity have been created to assess negative automatic thoughts in children and adolescents (e.g., Kazdin 1990; Marien and Bell 2004; Schniering and Rapee 2002). Moreover, extensive evidence indicates that the experience of negative automatic thoughts and a relative absence or low frequency of positive thoughts is associated with anxiety, depression, and suicidality (e.g., Ambrose and Rholes 1993; Garber et al. 1993; Jolly and Dykman 1994; Jolly and Wiesner 1996; Kazdin 1990; Nock and Kazdin 2002; Ronan and Kendall 1997; Schniering and Lyneham 2007; Schniering and Rapee 2004). It has also been established that significant changes in children's automatic thoughts reflect improvements as a result of treatment (Muris et al. 2009; Schniering and Lyneham 2007) and changes in negative automatic thoughts appear to mediate the impact of cognitive-behavioral treatment on depressive symptoms in adolescents (Kaufman et al. 2005).

Research in our laboratory on cognitive factors has focused on the development and applications of the Perfectionism Cognitions Inventory (Flett et al. 1998). The Perfectionism Cognitions Inventory (PCI) was created to assess the frequency of automatic thoughts that focus specifically on the attainment of ideal standards. The PCI is based on the premise that perfectionists who obsess about attaining perfectionism and who sense a discrepancy between their actual self and the ideal self, or their actual level of goal attainment and high ideals will tend to experience cognitions that reflect perfectionistic themes (see Flett et al. 1998). A tendency to ruminate about the inability to attain perfectionistic standards is consistent with evidence suggesting that the ideal self functions as a self-schema that facilitates the recall of perfectionistic content (Hewitt and Genest 1990). Flett et al. (1998) showed that there were individual differences in automatic, perfectionistic thoughts, and perfectionists with high levels of perfectionism cognitions are especially susceptible to negative affect in the form of depression about failure to attain perfection in the past, and anxiety about perhaps failing to attain perfection in the future.

In its current form, the PCI is a 25-item inventory with such statements as "I should be perfect" and "I should never make the same mistake twice". Enns and Cox (2002) concluded that the PCI "… assesses perfectionism from a unique, cognitive perspective" (p. 50). The PCI also differs from existing trait measures of perfectionism in that it is more of a state measure; that is, respondents indicate the

thoughts experienced within the past week, and it is conceivable that these thoughts may vary as a function of changes in situational events.

At present, research with the PCI has focused exclusively on college student samples and adult clinical samples there has been little attempt to examine perfectionism cognitions in other samples. To our knowledge, there have been no empirical attempts thus far to examine the characteristics and correlates of the PCI when administered to a sample of children or adolescents. Accordingly, in the current paper, we report the results of two initial studies that used the PCI to assess individual differences in perfectionistic automatic thoughts in adolescents. These studies evaluated the PCI from a psychometric perspective but also sought to establish the extent to which the PCI was associated with negative automatic thoughts in general and trait measures of perfectionism, self-criticism, and dependency. The PCI should be linked with trait perfectionism given that perfectionistic automatic thoughts and trait perfectionism both reflect the broader perfectionism construct. It should be associated with self-criticism given evidence linking trait perfectionism and self-criticism (e.g., Enns and Cox 1999; Enns et al. 2003; Frost et al. 1990; Hewitt and Flett 1991, 1993). In addition to examining the correlates of the PCI, we also examined whether individual differences in the frequency of automatic thoughts reflecting the need to be perfect could predict a significant degree of unique variance in depression, over and above the variance attributable to other factors (e.g., trait personality measures and the general measures of negative and positive automatic thoughts).

Method

Participants and Procedure

The first sample consisted of 250 adolescents (142 females, 108 males). Their mean age was 15.98 years (SD = 0.97). The participants were recruited from a high school in the Toronto area.

The second sample consisted of 105 adolescents (34 females, 71 males). The mean age of the participants in Sample 2 was 16.49 years (SD = 0.81). The ages of our participants ranged from 15 to 19 years old. The participants were recruited from a second high school in the Toronto area. Information about such variables as race or socio-economic status was not collected.

Measures

The participants were asked to take part in a study that examined "personality and adjustment." If they agreed to be in the study, and provided an informed consent signed by a parent or guardian, as well as by themselves, they were asked to complete a package of questionnaires. The first three measures described below were administered to participants in both samples. The other measures (automatic thoughts and self-criticism and dependency) were administered only to the participants in the smaller second sample.

Perfectionism Cognitions Inventory

As noted above, the PCI is a 25-item measure. The PCI instructions were patterned after the previous ATQ measures (see Table 1). Respondents are asked to rate the frequency of perfectionistic thoughts over the past week. Each thought is rated on a five-point scale (0–4). Research with university students by Flett et al. (1998) indicates that higher scores on the PCI are associated with various measures of self-punitiveness, including self-criticism, overgeneralization, and failure perseveration, and the PCI is not associated significantly with a measure of impression management. The three month test–retest reliability was estimated at .67 for

Table 1 Means, standard deviations, and item-total correlations for the PCI items

Item	*M*	SD	ITC	Loading
1. Why can't I be perfect?	1.44	1.30	.62	.68
2. I need to do better	2.97	1.06	.49	.53
3. I should be perfect	1.25	1.33	.66	.73
4. I should never make the same mistake twice	2.09	1.32	.59	.64
5. I've got to keep working on my goals	2.76	1.23	.39	.43
6. I have to be the best	1.59	1.41	.62	.69
7. I should be doing more	2.65	1.14	.53	.57
8. I can't stand to make mistakes	1.55	1.24	.64	.70
9. I have to work hard all the time	2.22	1.32	.60	.65
10. No matter how much I do, it's never enough	1.97	1.42	.49	.54
11. People expect me to be perfect	1.31	1.34	.54	.59
12. I must be efficient at all times	1.96	1.29	.63	.67
13. My goals are very high	1.74	1.38	.62	.66
14. I can always do better, even if things are almost perfect	1.87	1.45	.62	.68
15. I expect to be perfect	1.11	1.31	.66	.71
16. Why can't things be perfect?	1.92	1.47	.62	.65
17. My work has to be superior	1.57	1.28	.66	.71
18. It would be great if everything in my life were perfect	2.24	1.53	.50	.53
19. My work should be flawless	1.34	1.26	.68	.73
20. Things are seldom ideal	1.74	1.26	.44	.48
21. How well am I doing?	2.41	1.23	.35	.39
22. I can't do this perfectly	2.01	1.22	.46	.49
23. I certainly have high standards	1.69	1.34	.59	.63
24. Maybe I should lower my goals	0.90	1.18	.28	.30
25. I am too much of a perfectionist	0.88	1.24	.41	.46

$N = 250$. PCI item responses range from 0 to 4. ITC refers to item-total correlation

The instructions are as follows: Listed below are a variety of thoughts about perfectionism that sometimes pop into people's heads. Please read each thought and indicate how frequently, if at all, the thought occurred to you over the last week. Please read each item carefully and circle the appropriate number, using the scale below. Respondents make ratings from "0" to "4" with the following response options (not at all, sometimes, moderately often, often, all of the time)

students and .85 for psychiatric patients, so the measure has substantial temporal stability.

Child-Adolescent Perfectionism Scale

The CAPS (Flett et al. 1997) is a 22-item measure of perfectionism that assesses self-oriented perfectionism (e.g., I try to be perfect in everything I do), and socially prescribed perfectionism (e.g., There are people in my life who expect me to be perfect) in children with a minimum grade three reading level. The CAPS has been used in several investigations (e.g., Hewitt et al. 2002). In the current research, the alphas for the CAPS subscales were .84 or greater.

The Center for Epidemiologic Studies Depression Scale

The CES-D (Radloff 1977) is a 20-item self-report scale that measures current levels of depressive symptoms. This measure has been used widely and has been shown to be reliable and valid in several studies involving adolescents (e.g., Fichman et al. 1994; Roberts et al. 1990). The CES-D had alphas of .89 and .85 in our samples.

Automatic Thoughts Questionnaire

The Automatic Thoughts Questionnaire (ATQ; Hollon and Kendall 1980) is a 30-item scale that presents respondents with a series of negative thoughts and they must indicate the frequency with which they have experienced these negative thoughts during the past week. Several studies have demonstrated the reliability and validity of the ATQ (e.g., Dobson and Breiter 1983; Hollon and Kendall 1980). The alpha was .96 in the current research.

Automatic Thoughts Questionnaire-Positive

The positive version of the Automatic Thoughts Questionnaire (ATQ-P; Ingram and Wisnicki 1988) consists of 30 positive thoughts that were included to supplement the negative thoughts listed on the ATQ. The ATQ-P has adequate reliability and validity (Burgess and Haaga 1994; Ingram et al. 1990, 1995; Ingram and Wisnicki 1988; Lightsey 1994). The ATQ-P was completed with respect to the thoughts experienced during the past week. In the current research, the alpha for the ATQ-P was .94.

The Adolescent Depressive Experiences Questionnaire

The DEQ-A developed by Fichman et al. (1994) is an abbreviated 20-item measure that was developed for use by adolescents. It provides separate scales assessing self-criticism (eight items), and dependency (eight items). Previous research with these abbreviated scales found an alpha of .65 for self-criticism and alphas of .69 and .70

for dependency (Fichman et al. 1994, 1996). Analyses of our data indicated that the DEQ-A subscales had alphas of .75 for self-criticism and .80 for dependency.

Results

Psychometric Analyses

A principal components analysis was conducted on the data from our first sample of 250 adolescents to determine whether the factor structure of the PCI in adolescents is similar to that obtained with an adult sample (see Flett et al. 1998). Specifically, a one-dimensional solution should be obtained with all items loading strongly on this component. Indeed, although we found 4 components with eigenvalues greater than 1, the first component was clearly distinguishable from the others on a scree plot. This component accounted for 36.49% of the variance (eigenvalue = 9.12) while none of the other factors accounted for more than 7% of the variance (maximum eigenvalue for the other factors was 1.70).

The item loadings were generally quite high, with most items loading higher than .5 and all but two items loading higher than .40. Item 24 had the smallest loading (.30). Flett et al. (1998) also found item 24 to have a relatively low component loading. Overall, the results of the principal components analysis with adolescents is highly consistent with previous findings using adults, and strongly suggests that the PCI taps one broad, general dimension.

The Cronbach's alpha for the PCI was .91 in the first sample. Mean levels of item endorsement in our first sample are shown in Table 1. The final two items had lower levels of endorsement but these items were retained because they reflect self-statements involving a growing sense that perfectionism is costly and maladaptive, and these items could provide useful information in clinical contexts for certain adolescents.

Analyses of data from our second sample confirmed that the PCI had a high level of internal consistency with an obtained alpha of .91 and a mean inter-item correlation of .30. A principal component analysis was not conducted on the data from our second sample due to sample size restrictions but the mean inter-item correlation is consistent with the position that the scale consists of only one factor, according to the criteria provided by Briggs and Cheek (1986). The item-total correlations in sample 2 ranged from .29 to .68 with most values being .50 or greater.

Almost identical mean PCI scores were obtained across samples. The mean score on the PCI was 45.2 (SD = 19.4) in Sample 1. In this sample, females (M = 47.1, SD = 19.9) tended to have higher perfectionism cognitions than males (M = 42.7, SD = 18.6) although this difference did not reach significance. The overall mean for the PCI scale in sample two was 45.3 (SD = 17.4). Once again there were no significant gender differences in mean PCI scores. The respective means for females and males were 45.0 (SD = 16.6) and 45.5 (SD = 18.0). These values are somewhat higher than the overall means of 38.25 for women and 35.41 for men that were obtained in the initial study with college students (see Flett et al. 1998; Study

1) and are more in keeping with the mean of 46.79 obtained recently in a sample of 258 psychiatric patients (see Flett et al. 2007).

Correlations with the PCI in Sample 1

Correlations were computed among the measures administered to our first sample. It was found that the PCI was correlated significantly with depressive symptoms, $r = .34$, $p < .001$. Depressive symptoms were also correlated significantly with self-oriented perfectionism, $r = .23$, $p < .001$, and socially prescribed perfectionism, $r = .38$, $p < .001$.

Correlations with the PCI in Sample 2

Pearson correlation coefficients were computed between the PCI and the trait measures of perfectionism, as well as the measures of self-criticism, dependency, and depression. The results for Sample 2 are summarized in Table 2. As expected, evidence of concurrent validity was obtained in that the PCI was associated significantly with self-oriented perfectionism, $r = .60$, $p < .001$, and socially prescribed perfectionism, $r = .50$, $p < .001$. The two CAPS dimensions were also associated significantly, $r = .40$, $p < .001$.

Additional analyses indicated that the total score on the PCI was correlated significantly with self-criticism, $r = .38$, $p < .01$, dependency, $r = .39$, $p < .01$, and with depression, $r = .43$, $p < .001$. Depression was also associated with self-oriented perfectionism, $r = .23$, $p < .05$, and with socially prescribed perfectionism, $r = .32$, $p < .01$.

Further analyses showed that the PCI was not correlated significantly with the ATQ-P, $r = .09$, ns. However, the PCI was associated significantly with the negative thoughts listed on the ATQ, $r = .46$, $p < .01$.

Table 2 Zero-order correlations among the measures (Sample 2)

	PCI	ATQ-P	ATQ-N	SELF	SOCIAL	SELFCRIT	DEPEND	CESD
PCI	1.00							
ATQ-P	.09	1.00						
ATQ-N	.46***	−.48***	1.00					
SELF	.61***	.09	.30**	1.00				
SOCIAL	.50***	−.04	.40***	.40***	1.00			
SELFCRIT	.38***	−.53***	.70***	.21*	.36***	1.00		
DEPEND	.39***	−.07	.41***	.41***	.36***	.49***	1.00	
CESD	.43***	−.51***	.77***	.23*	.32**	.64***	.48***	1.00

PC Perfectionism Cognitions Inventory, *ATQ-P* Automatic Thoughts Positive, *ATQ-N* Automatic Thoughts Negative, *SELF* Self-oriented Perfectionism, *SOCIAL* Socially Prescribed Perfectionism, *SELFCRIT* Self-Criticism, *DEPEND* Dependency, *CESD* CES-D Depression Scale

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Hierarchical Regressions

Our final series of analyses tested whether the PCI is capable of accounting for a significant degree of unique variance in levels of psychological distress when it is included as a predictor in regression analyses after other relevant predictors had already been entered. The first analysis was conducted with the Sample 1 data and included the CAPS measures as the first predictor block. Trait perfectionism accounted for 15% of the variance in CES-D scores, $p < .01$, with socially prescribed perfectionism being the significant predictor within the block (see Table 3). Addition of the PCI in the subsequent block accounted for an additional 3% of the variance in CES-D scores, $t = 2.91$, $p < .01$.

This analysis was repeated on the data from Sample 2. Trait perfectionism as assessed by the CAPS accounted for 11% of the variance in CES-D scores, $p < .01$, with socially prescribed perfectionism once again being the significant predictor within the block (see Table 3). Addition of the PCI in the subsequent block accounted for an additional 9% of the variance in CES-D scores, $t = 3.36$, $p < .01$.

Table 3 Hierarchical regression analyses predicting depression

Variable	R^2	R^2 change	β	t
Sample one analysis				
PCI versus CAPS				
CAPS predictor block	0.15	0.15**		
Self-oriented			.08	1.28
Socially prescribed			.35	5.34**
PCI	0.18	0.03**	.21	2.91**
Sample two analyses				
PCI versus CAPS				
CAPS predictor block	0.11	0.11**		
Self-oriented			.11	1.12
Socially prescribed			.28	2.70**
PCI	0.20	0.09**	.40	3.36**
PCI versus DEQ-A				
DEQ-A predictor block	0.44	0.44**		
Self-criticism			.53	6.27**
Dependency			.22	2.61*
PCI	0.47	0.03*	.18	2.21*
PCI versus ATQ				
ATQ predictor block	0.61	0.61**		
Positive thoughts			−.18	−2.59*
Negative thoughts			.54	6.45**
PCI	0.64	0.03**	.21	2.79**

* $p < .05$; ** $p < .01$. Based on 250 adolescents in Sample 1 and 105 adolescents in Sample 2

The next analysis examined the ability of the PCI to account for unique variance, over and above self-criticism and dependency. As can be seen in Table 3, both self-criticism and dependency accounted for unique variance in depression scores, and collectively the DEQ-A variables accounted for 44% of the variance in CES-D scores. Nevertheless, subsequent entry of the PCI showed that it accounted for a significant 3% of the remaining variance, $t = 2.21$, $p < .05$.

The final analysis examined the respective ability of all three automatic thoughts measures to predict variance in depression scores. Entry of the first block of predictors comprised of the ATQ measures showed that both the ATQ and ATQ-P accounted for unique variance in depression scores. Importantly, subsequent entry of the PCI showed that it accounted for a significant 3% of the remaining variance, $t = 2.79$, $p < .01$ (see Table 3).

Discussion

Although psychometric issues were the main focus of this paper, our overarching purpose was to establish the presence of individual differences in perfectionistic automatic thoughts among adolescents. We also sought to demonstrate the importance of assessing these thoughts in terms of their links with other personality vulnerability factors and indices of distress.

The first goal of this research was to examine the psychometric properties of the PCI in an adolescent sample. This focus is in keeping with previous calls (e.g., Glass and Arnkoff 1997) to evaluate the characteristics of measures designed for adults when these measures are administered subsequently to children and adolescents. Our results confirmed that the PCI has an adequate degree of internal consistency and it has concurrent validity, in terms of its association with the trait perfectionism dimensions assessed by the Child-Adolescent Perfectionism Scale. Our initial results suggest that the PCI is a potentially useful measure when seeking to evaluate the thinking patterns of distressed adolescents and the efficacy of cognitive-behavioral interventions that target these thinking patterns.

Correlations with Depression and Negative Automatic Thoughts

As alluded to above, this study was also conducted to determine the extent to which individual differences in the frequency of perfectionistic thoughts were associated with depression and more general measures of automatic thoughts in an adolescent sample. Our analyses confirmed that the PCI was indeed associated with depression, and this is in keeping with several studies of the link between perfectionism cognitions and distress in adults (see Flett et al. 1998). Statistical tests also found that the PCI was correlated with the presence of negative automatic thoughts but it was not correlated significantly with positive automatic thoughts. A similar pattern of findings emerged in the original PCI research conducted with university students (Flett et al. 1998; Study 1).

An important goal from the outset of this study was to examine the usefulness of the PCI in an adolescent sample, in terms of its ability to account for unique variance in depression, over and above the variance attributable to other measures correlated with the PCI, such as the more general indices of automatic thoughts and the trait dimensions of perfectionism. A series of hierarchical regression analyses conducted on the data from both samples confirmed that the PCI did indeed predict a significant degree of unique variance. The first analyses examined whether the PCI could account for unique variance in depression when entered after the trait CAPS dimensions. Both CAPS variables were correlated significantly with depression in this research, but the PCI accounted for a significant amount of the remaining variance in depression scores that was not accounted for by the CAPS dimensions. Moreover, in terms of the magnitude of zero-order correlations, the PCI had a stronger link with depression than was evident between the CES-D and self-oriented and socially prescribed perfectionism.

Clearly, the most stringent test for the PCI in the present study was whether it could account for unique variance in depression when entered after measures of automatic thoughts and self-criticism and dependency. In general, these variables (i.e., automatic thoughts, self-criticism, and dependency) had more robust zero-order correlations with the CES-D than did the trait perfectionism variables and the results of the regression analysis showed that both self-criticism and dependency predicted unique variance. Although self-criticism and dependency are not always linked with adolescent depression, links with these personality traits are typically evident (see Abela and Hankin 2007). Our results accord with a growing number of studies that illustrate the link between depressive symptoms and elevated levels of self-criticism and dependency is adolescents (e.g., Fehon et al. 2000; Enns et al. 2003). Nevertheless, the regression analyses indicated that the PCI accounted for a significant amount of unique variance when entered after the more general measures of automatic thoughts and after self-criticism and dependency.

Although there is a continuing tendency for highly maladaptive dimensions of perfectionism to be seen as linked with self-criticism in a common factor referred to as self-critical perfectionism (see Clara et al. 2007; McWhinnie et al. 2009), the pattern of correlations displayed in Table 2 indicates that self-criticism and perfectionism should be distinguished, especially when perfectionism is assessed in terms of automatic thoughts. The correlations between self-criticism and the three perfectionism dimensions were modest in magnitude (r's ranging from .21 to .38). In addition, self-criticism had robust correlations with the ATQ measures of negative automatic thoughts ($r = .70$) and positive automatic thoughts ($r = -.53$) and this emphasizes the very salient cognitive component of self-criticism. In contrast, the PCI was correlated with negative automatic thoughts ($r = .53$) but it was not associated significantly with positive automatic thoughts. Similarly, the trait perfectionism dimensions (self-oriented and socially prescribed perfectionism) were both associated significantly with negative automatic thoughts, but were not associated with positive automatic thoughts. These data suggest that there are some subtle yet important differences between perfectionism and self-criticism and it is important to consider at a conceptual level the extent to which these constructs overlap.

The results of our hierarchical regression analysis involving the three automatic thoughts measure (see Table 3) are quite consistent with a similar regression analysis conducted with college students which found that all three measures of automatic thoughts were significant predictors (see Flett et al. 1998). Collectively, these results can be regarded as evidence for the potential usefulness of a joint approach and a broad emphasis on various cognitions that includes a focus on negative and positive thoughts about the self that are experienced at a global level, as well as more specific thoughts that reflect personality constructs such as perfectionism. This has important implications for prevention and intervention efforts. There is some evidence for the usefulness of prevention programs (e.g., Kowalenko et al. 2005; Spence et al. 2003), but authors such as Spence and Shortt (2007) have concluded that universal, school-based approaches do not take into account the complex personal and identity issues that are putting certain adolescents at risk. One clear interpretation of our findings is that some adolescents may require a more differentiated treatment approach that includes an explicit focus on specific personality themes such as perfectionism and profound self-criticism as a supplement to a focus on automatic thoughts in general.

Although the results of our study indicate that the PCI is a potentially useful measure in adolescents, several issues remain to be investigated in future research. For instance, research is needed with clinical samples to establish the norms for various adolescents with various diagnoses. In addition, it will be important to examine the stability of the PCI over time in adolescents, and related issues such as whether the PCI can predict changes in levels of psychological distress over time. There is also a need to examine whether the PCI is responsive to treatment interventions that target elevated perfectionism. A previous study with university students found that PCI scores were responsive to a cognitive-behavioural intervention (see Arpin-Cribbie et al. 2008), but this issue remains to be examined among children and adolescents.

In summary, the initial psychometric information obtained in the present investigation suggests that the PCI is a reliable and valid measure when administered to adolescents. We found that that frequent perfectionistic thoughts as assessed by the PCI were associated significantly with a measure of depressive symptoms and related phenomena, such as the experience of negative automatic thoughts about the self and a relative paucity of favorable thoughts about self. Also, adolescents who reported frequent perfectionistic thoughts also tended to be characterized by trait self-criticism in a manner consistent with the view that self-critical forms of perfectionism exist and the negative self-talk of these individuals includes negative themes and perfectionistic themes that pertain to the self. Finally, as expected, the PCI accounted for unique variance in levels of depressive symptoms, over and above the variance attributable to trait dimensions of perfectionism and general measures of automatic thoughts. Collectively, these findings suggest that a focus on trait-specific forms of automatic thoughts such as perfectionistic cognitions may provide some helpful insights into the personality components associated with maladjustment in adolescents.

Acknowledgments This research was supported by a grant from the Social Sciences and Humanities Research Council of Canada awarded to the authors as well as a Research Impact Knowledge

Mobilization Grant awarded to the first author. Gordon Flett was supported by a Canada Research Chair in Personality and Health.

References

Abela, J. R. Z., & Hankin, B. L. (2007). Cognitive vulnerability to depression in children and adults: A developmental psychopathology perspective. In J. R. Z. Abela & B. L. Hankin (Eds.), *Handbook of depression in children and adolescents* (pp. 35–78). New York: Guilford.

Ambrose, B., & Rholes, W. S. (1993). Automatic cognitions and the symptoms of depression and anxiety in children and adolescents: An examination of the content-specificity hypothesis. *Cognitive Therapy and Research, 17*, 153–171.

Arpin-Cribbie, C. A., Irvine, J., Ritvo, P., Cribbie, R. A., Flett, G. L., & Hewitt, P. L. (2008). Perfectionism and psychological distress: A modeling approach to understanding their therapeutic relationship. *Journal of Rational-Emotive & Cognitive-Behavior Therapy, 26*, 151–167.

Briggs, S. R., & Cheek, J. M. (1986). The role of factor analysis in the development and evaluation of personality scales. *Journal of Personality, 54*, 106–148.

Burgess, E., & Haaga, D. A. F. (1994). The positive automatic thoughts questionnaire and the automatic thoughts questionnaire—revised: Equivalent measures of positive thinking? *Cognitive Therapy and Research, 18*, 15–24.

Clara, I. P., Cox, B. J., & Enns, M. W. (2007). Assessing self-critical perfectionism in clinical depression. *Journal of Personality Assessment, 88*, 309–316.

Dobson, K. S., & Breiter, H. J. (1983). Cognitive assessment of depression: Reliability and validity of three measures. *Journal of Abnormal Psychology, 92*, 107–109.

Enns, M. W., & Cox, B. J. (1999). Perfectionism and depressive symptom severity in major depressive disorder. *Behaviour Research and Therapy, 37*, 783–794.

Enns, M. W., & Cox, B. J. (2002). The nature and assessment of perfectionism: A critical analysis. In G. L. Flett & P. L. Hewitt (Eds.), *Perfectionism: Theory, research, and treatment* (pp. 33–62). Washington, DC: American Psychological Association.

Enns, M. W., Cox, B. J., & Inayatulla, M. (2003). Personality predictors of outcomes for adolescents hospitalized for suicidal ideation. *Journal of the American Academy of Child and Adolescent Psychiatry, 42*, 720–727.

Fehon, D. C., Grilo, C. M., & Martino, S. (2000). A comparison of dependent and self-critically depressed hospitalized adolescents. *Journal of Youth and Adolescence, 29*, 93–106.

Fichman, L., Koestner, R., & Zuroff, D. C. (1994). Depressive styles in adolescence: Assessment, relation to social functioning, and developmental trends. *Journal of Youth and Adolescence, 23*, 315–330.

Fichman, L., Koestner, R., & Zuroff, D. C. (1996). Dependency, self-criticism, and perceptions of inferiority at summer camp: I'm even worse than you think. *Journal of Youth and Adolescence, 25*, 113–126.

Flett, G. L., Hewitt, P. L., Blankstein, K. R., & Gray, L. (1998). Psychological distress and the frequency of perfectionistic thinking. *Journal of Personality and Social Psychology, 75*, 1363–1381.

Flett, G. L., Hewitt, P. L., Boucher, D. J., Davidson, L. A., & Munro, Y. (1997). *The child-adolescent perfectionism scale: Development, validation, and association with adjustment*. Unpublished manuscript, York University, Toronto.

Flett, G. L., Hewitt, P. L., Whelan, T., & Martin, T. R. (2007). The perfectionism cognitions inventory: Psychometric properties and associations with distress and deficits in cognitive self-management. *Journal of Rational-Emotive & Cognitive-Behavior Therapy, 25*, 255–277.

Frost, R. O., Marten, P. A., Lahart, C., & Rosenblate, R. (1990). The dimensions of perfectionism. *Cognitive Therapy and Research, 14*, 449–468.

Garber, J., Weiss, B., & Shanley, N. (1993). Cognitions, depressive symptoms, and development in adolescents. *Journal of Abnormal Psychology, 102*, 47–57.

Glass, C. R., & Arnkoff, D. B. (1997). Questionnaire methods of cognitive self-statement assessment. *Journal of Consulting and Clinical Psychology, 65*, 911–927.

Hewitt, P. L., Caelian, C. F., Flett, G. L., Sherry, S. B., Collins, L., & Flynn, C. A. (2002). Perfectionism in children: Associations with depression, anxiety, and anger. *Personality and Individual Differences, 32*, 1049–1061.

Hewitt, P. L., & Flett, G. L. (1991). Perfectionism in the self and social contexts: Conceptualization, assessment, and association with psychopathology. *Journal of Personality and Social Psychology, 60*, 456–470.

Hewitt, P. L., & Flett, G. L. (1993). Dimensions of perfectionism, daily stress, and depression: A test of the specific vulnerability hypothesis. *Journal of Abnormal Psychology, 102*, 58–65.

Hewitt, P. L., & Genest, M. (1990). The ideal-self: Schematic processing of perfectionistic content in dysphoric university students. *Journal of Personality and Social Psychology, 59*, 802–808.

Hollon, S. D., & Kendall, P. C. (1980). Cognitive self-statements in depression: Development of an automatic thoughts questionnaire. *Cognitive Therapy and Research, 4*, 383–395.

Ingram, R. E., Kendall, P. C., Siegle, G., Guarino, J., & McLaughlin, S. C. (1995). Psychometric properties of the positive automatic thoughts questionnaire. *Psychological Assessment, 7*, 495–507.

Ingram, R. E., Slater, M. A., Atkinson, J. H., & Scott, W. (1990). Positive automatic cognition in major affective disorder. *Psychological Assessment, 2*, 209–211.

Ingram, R. E., & Wisnicki, K. S. (1988). Assessment of automatic positive cognition. *Journal of Consulting and Clinical Psychology, 56*, 898–902.

Jolly, J. B., & Dykman, R. A. (1994). Using self-report data to differentiate anxious and depressive symptoms in adolescents: Cognitive content specificity and global distress? *Cognitive Therapy and Research, 18*, 25–37.

Jolly, J. B., & Wiesner, D. C. (1996). Psychometric properties of the automatic thoughts questionnaire-positive with inpatient adolescents. *Cognitive Therapy and Research, 20*, 481–498.

Kaufman, N. K., Rohde, P., Seeley, J. R., Clarke, G. N., & Stice, E. (2005). Potential mediators of cognitive-behavioral therapy for adolescents with comorbid major depression and conduct disorder. *Journal of Consulting and Clinical Psychology, 73*, 38–46.

Kazdin, A. E. (1990). Evaluation of the automatic thoughts questionnaire: Negative cognitive processes and depression among children. *Psychological Assessment, 2*, 73–79.

Kowalenko, N., Rapee, R. M., Simmons, J., Wignall, A., Hoge, R., Whitefield, K., et al. (2005). Short-term effectiveness of a school-based early intervention program for adolescent depression. *Clinical Child Psychology and Psychiatry, 10*, 493–507.

Lightsey, O. R. (1994). Positive cognitions as moderators of the negative life event-depression relationship. *Cognitive Therapy and Research, 18*, 353–365.

Marien, W. E., & Bell, D. J. (2004). Anxiety- and depression-related thoughts in children: Development and evaluation of a cognitive measure. *Journal of Clinical Child and Adolescent Psychology, 33*, 717–730.

McWhinnie, C. M., Abela, J. R., Knauper, B., & Zhang, C. (2009). Development and validation of the revised children's dysfunctional attitudes scale. *British Journal of Clinical Psychology, 48*, 287–308.

Muris, P., Mayer, B., den Adel, M., Roos, T., & van Wamelen, J. (2009). Predictors of change following cognitive-behavioral treatment of children with anxiety problems: A preliminary investigation of negative automatic thoughts and anxiety control. *Child Psychiatry and Human Development, 40*, 139–151.

Nock, M. K., & Kazdin, A. E. (2002). Examination of affective, cognitive, and behavioral factors and suicide-related outcomes in children and young adolescents. *Journal of Clinical Child and Adolescent Psychology, 31*, 48–58.

Radloff, L. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement, 1*, 385–401.

Roberts, R. E., Andrews, J. A., Lewinsohn, P. M., & Hops, H. (1990). Assessment of depression in adolescents using the Center for Epidemiologic Studies in depression scale. *Psychological Assessment, 2*, 122–128.

Ronan, K. R., & Kendall, P. C. (1997). Self-talk in distressed youth: States-of-mind and content specificity. *Journal of Clinical Child Psychology, 26*, 330–337.

Schniering, C. A., & Lyneham, H. J. (2007). The children's automatic thoughts scale in a clinical sample: Psychometric properties and clinical utility. *Behaviour Research and Therapy, 45*, 1931–1940.

Schniering, C. A., & Rapee, R. M. (2002). Development and validation of a measure of children's automatic thoughts: The children's automatic thoughts scale. *Behaviour Research and Therapy, 40*, 1091–1109.

Schniering, C. A., & Rapee, R. M. (2004). The relationship between automatic thoughts and negative emotions in children and adolescents: A test of the cognitive content-specificity hypothesis. *Journal of Abnormal Psychology, 113*, 464–470.

Spence, S. H., Sheffield, J. K., & Donovan, C. L. (2003). Preventing adolescent depression: An evaluation of the problem solving for life program. *Journal of Consulting and Clinical Psychology, 71*, 3–13.
Spence, S. H., & Shortt, A. L. (2007). Research review: Can we justify the dissemination of universal, school-based interventions for the prevention of depression among children and adolescents? *Journal of Child Psychology and Psychiatry, 48*, 526–542.