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Not all Perfectionism Cognitions are Multidimensional: Evidence for the Perfectionism Cognitions Inventory-10

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Abstract

The measurement of perfectionistic cognitions has recently caused disagreement among researchers. Flett, Hewitt, Blankstein and Gray (1998) proposed that perfectionistic cognitions are unidimensional. However, after re-examining the factor structure of the instrument used to measure perfectionistic automatic thoughts (Perfectionism Cognitions Inventory, PCI), Stoeber, Kobori, and Tanno (2014a) argued that perfectionistic cognitions are multidimensional. Researchers are now faced with a dilemma; should they adopt a multidimensional approach derived from analysis of the underpinning structure of the instrument or should theory take precedence and the instrument be revised? In considering these two alternatives, in this instance, we advocate the latter strategy. In accord, in the current study we assess the factor structure of the PCI with the intention of creating a unidimensional version of the instrument. In doing so, we provide evidence to support the use of a new shorter version of the PCI. Unlike the original PCI, the PCI-10 has a unidimensional structure that replicates across independent samples. The PCI-10 and the original PCI are also highly correlated. Based on this evidence, we propose that that the PCI-10 provides a short, psychometrically sound, instrument to measure perfectionistic cognitions in the unidimensional manner it was intended.

Key Words: Questionnaire, Survey, Psychometrics

Perfectionism has typically been studied as a personality trait. However, perfectionism can also be studied in terms of individual differences in the frequency with which people experience perfectionistic cognitions. Perfectionistic cognitions are automatic ruminative thoughts and images involving the need to be perfect (Flett, Hewitt, Blankstein, & Gray, 1998). As described by Flett et al., perfectionistic cognitions can be understood in context of theories of rumination and as a form of end-state thinking. That is, they are a set of thoughts that occur following failure to reach important goals and when attention shifts towards the self and personal discrepancies (Martin & Tesser, 1989). As such, perfectionistic cognitions are expected to be common among those who seek perfection as, in most circumstances and for most people, perfection is an irrational and impossible goal. In addition, because the themes of perfectionistic cognitions are focused on personal deficiencies, counterfactual thinking, and personal imperatives (i.e., what could have and should have been), they are counter-productive, negatively-valanced, and have a detrimental impact on mental health.

In comparison to trait perfectionism, perfectionistic cognitions have received much less attention in research. However, the research that has taken place has been consistent with the theoretical expectations of Flett et al.'s (1998) model. In particular, research has found that more frequent perfectionistic cognitions are related to the experience of negative emotions (e.g., anger and anxiety; Donachie, Hill, & Hall, 2018), more difficulty regulating cognitive-emotion tendencies (e.g., catastrophization, self-blame, reappraisal; Rudolph, Flett, & Hewitt, 2007) and mental health problems (e.g., depressive symptoms; Flett et al., 2012). Notably, research has also found perfectionistic cognitions predict variance in the experience of anxiety, depressive symptoms and burnout symptoms after taking into account trait perfectionism (e.g., Flett et al., 1998; Flett, Hewitt, Whelan, & Martin, 2007; Hill &

Appleton, 2011). In other words, perfectionistic cognitions predict the distress people experience independent of their typical perfectionistic behaviour (i.e., trait perfectionism).

Unidimensional versus multidimensional perfectionistic cognitions

A recent debate has arisen that has the potential to alter the way in which perfectionistic cognitions are studied. This debate pertains to whether perfectionistic cognitions are best considered unidimensional or multidimensional. In developing the instrument used to measure perfectionistic cognitions (Perfectionism Cognitions Inventory, PCI), Flett et al. (1998) proposed that perfectionistic cognitions were unidimensional. That is, perfectionistic cognitions are best represented as a single factor capturing the frequency of negative, intrusive and ruminative thoughts that pertain to the need for perfection (with "no underlying causal structure involving two or more components" p.1365). This was primarily because their conceptualisation of perfectionistic cognitions was couched within particular theories of rumination (e.g., Nolen-Hoeksema, 1996; Klinger, 1996; Pyszczynski & Greenberg, 1987). In these theories rumination is typically considered unintentional, unwanted and, in keeping with the Flett et al.'s overarching model, essentially "the dysfunctional residual of a failed discrepancy reduction" (Wanke & Schmid, 1996, p.180)

Stoeber and colleagues (Stoeber, Kobori, & Brown, 2014a), though, have more recently argued that Flett et al. (1998) made an error when conceptualising perfectionistic cognitions as unidimensional. This assertion was made for three reasons. First, Stoeber et al. argued that a focus on available literature, experience in counselling perfectionists, and understanding of the perfectionism construct should have led Flett et al. to conclude perfectionistic cognitions were most likely similar to trait perfectionism which is multidimensional. Second, scrutiny of the items of the PCI suggest that it includes at least two broad dimensions. One being perfectionistic strivings (e.g., "My goals are very high") and the other being perfectionistic concerns (e.g., "No matter how much I do, it's never enough"). Again, this matches how trait perfectionism can be conceptualised and measured. Third, re-examination of the factor structure of the PCI as presented in the original and subsequent validation work reveals two or three underlying factors when using more rigorous statistical testing (Flett et al., 1998; Flett et al., 2012).

With these issues in mind, Stoeber and colleagues proposed the Multidimensional-Perfectionism Cognitions Inventory (MPCI; Kobori, 2006; Kobori & Tanno, 2004; Stoeber, Kobori, & Tanno, 2010)[1]. As described by Stoeber et al. (2010), the MPCI is based on the PCI and uses the same instructions and timeframe ("past week"). However, the MPCI differs from the PCI in that the MPCI includes three dimensions and emphasises the experience of both positively and negatively-valanced perfectionistic cognitions. Personal standards capture cognitions about having perfectionistic standards (e.g., "It's important to set high standards for myself"). Pursuit of perfection capture cognitions about the need to be perfect (e.g., "I must be perfect at any cost"). Finally, concern over mistakes capture cognitions about mistakes (e.g., "I'll blame myself if I make a mistake"). In support of the use of the MPCI, Stoeber and colleagues provided evidence of the validity and reliability of the instrument. This includes confirmation of its underlying multidimensional structure (e.g., Stoeber et al., 2010).

Important for the current study, in developing the MPCI, Stoeber et al. (2014a) also re-examined the dimensionality of the PCI and derived a multidimensional version of the PCI (referred to hereon as the HF-MPCI) so to compare the predictive ability of a multidimensional versus unidimensional approach to perfectionistic cognitions. Regarding

[1] The Multidimensional Perfectionism Inventory (MPCI) was originally developed in Japanese by Kobori (2006; Kobori & Tanno, 2004). An English version (MPCI-E) was later developed by Stoeber, Kobori, and Tanno (2010). In keeping with descriptions elsewhere, we use "MPCI" throughout when referring to both these instruments.

the dimensionality of the PCI, it was found to have three factors which were labelled perfectionistic concerns (e.g., “Why can’t things be perfect?”), perfectionistic strivings (e.g., “My goals are very high”), and perfectionistic demands (e.g., “I should be doing more”). Comparison of the predictive ability of this multidimensional version and the original unidimensional version indicated that the multidimensional version had greater predictive ability in regard to positive affect, negative affect and depressive symptoms. Stoeber et al. concluded that the PCI was multidimensional and that assessing perfectionistic cognitions in multidimensional manner is more advantageous than assessing them in a unidimensional manner.

Flett and Hewitt (2014) were unconvinced by the reconceptualization of perfectionistic cognitions as unidimensional. In a response to Stoeber et al. (2014a), they reaffirmed their position that in their model perfectionistic cognitions are unidimensional. In doing so, they questioned the interpretability of the three factors of the HF-MPCI, the appropriateness of the factor labels and the distinctiveness of the factors based on their item content[2]. This stalemate poses researchers with a dilemma. Should those interested in Flett et al.’s (1998) perfectionistic cognitions adopt a multidimensional approach derived from analysis of the underpinning structure of the PCI or should theory take precedence and the instrument be revised? In considering these two alternatives, in this instance, we advocate the latter strategy. We do so for two reasons; (1) exploratory factor analysis is more likely to provide meaningful solutions when theory is used to guide decision making and (2) there has,

[2] Readers are also directed to Stoeber, Kobori, & Brown (2014b) for a response to Hewitt and Flett (2014) in which the Stoeber and colleagues reiterated their support for considering the PCI in a multidimensional fashion and highlighted the negative consequences of not doing so (viz. suppression).

as yet, been no theoretical basis offered for multidimensional perfectionistic cognitions within Flett's et al.'s (1998) model.

On these two related issues, although exploratory factor analysis is a technique typically associated with the absence of theory, the importance of theory when available is a common theme in accounts of its use. The argument being that, where possible, researchers should consider relevant theory and previous research when using exploratory factor analysis, and that if the model derived from this analysis is not interpretable or "theoretically sensible" it has little value (Fabrigar, Wegener, MacCallum, & Strahan, 1999, p.281). Whether the underlying latent factors are meaningful is determined by the researcher who needs to consider a range of issue including what is known about the constructs and how they are best operationalised (Henson & Roberts, 2006). It is these things, along with a clear definition of the construct and its attributes, that provide the required conceptual basis to make sense of what is ultimately an exploratory technique (Worthington & Whittaker, 2006). The subjective aspect of interpreting the results of exploratory factor analysis is acknowledged by Stoeber, Kobori, and Brown (2014b) in their reply to Flett and Hewitt (2014). However, still, no theoretical basis for the HF-PCI was been offered. Given that Flett and Hewitt (2014) currently see little place for multidimensional perfectionistic cognitions within their model, and an alternative theoretical basis for multidimensional perfectionistic cognitions has yet to be articulated, the HF-MPCI appears unmerited and supererogatory.

Present study

As the HF-MPCI currently has no theoretical basis in Flett et al.'s (1998) model and there is evidence that the PCI is multidimensional not unidimensional, the purpose of the study was to develop a new unidimensional version of the PCI. In doing so, we tested both the validity of the two factor structures of the PCI proposed by Flett et al. and Stoeber et al (2014a), and explored the underlying factor structure and item content of the PCI.

Methods

Participants

Sample one. Participants were 206 youth soccer (male=78, *M* age=15.53 years, *SD*=1.93, range=11 to 19 years) recruited from sports clubs, sports academies, and national teams in the United Kingdom. They reported, on average, that the length of time they had participated in soccer was 9.07 years (*SD*=2.98, range=1 to 17 years). This sample has been used in a published piece of research previously and formed the basis of the initial validation of a new unidimensional PCI presented in the current paper (Donachie et al., 2018).

Sample two. Participants were 218 youth rugby union players (male=201, unreported = 7, *M* age=16.68 years, *SD*=1.57, range=12 to 20 years) recruited from professional and semi-professional rugby clubs in the United Kingdom. They reported, on average, that the length of time they had participated in rugby was 7.36 years (*SD*=3.04, range=1 to 15 years). This sample was used as a second independent sample to validate the new instrument once derived.

The use of these two samples reflects our interest in perfectionism in youth sport. It also builds on a small number of studies that have illustrated the importance of perfectionistic cognitions in regard to predicting emotions, burnout, and motivational climate in youth sport settings (Appleton, Hall, & Hill, 2011; Donachie et al., 2018; Hill & Appleton, 2011). It is important to note that, while the instrument was distributed to youth athletes, the instructions and items were not amended. The instrument was therefore the same as that distributed by Stoeber et al. (2014a).

Data analysis

To test the two previously proposed factor structures and the factor structure of a new unidimensional version of the PCI we used confirmatory factor analysis (CFA) and exploratory-structural equation modelling (ESEM). CFA provides a stringent test of factor structure by stipulating cross-loadings are zero whereas ESEM allows for non-zero cross-loadings. The result is greater correspondence between exploratory factor analysis and ESEM than with CFA. ESEM is also more appropriate when constructs have complex underlying structures (Marsh et al., 2009). CFA and ESEM were conducted using M*plus* 8.2 (Muthén & Muthén, 2018) with robust maximum likelihood estimation (MLR) and, for ESEM, TARGET rotation to guide cross-loadings with a target value close to zero (Asparouhov & Muthén, 2009). Factor loadings were considered meaningful when >.30. Multiple indexes were used to assess model fit in the confirmatory and exploratory-confirmatory analyses: chi-square statistic (χ^2), comparative fit index (CFI), root mean square error of approximation (RMSEA), 90% confidence intervals of the RMSEA, and the standardized root-mean-square residual (SRMR). Conventional criteria were used when interpreting these indexes with values >.90 CFI, < .08 RMSEA (90% CI <.05 to <.08) and <.08 SRMR providing evidence of adequate model fit (Marsh, Hau, & Wen, 2004).

To guide the development of a new unidimensional PCI, we also used exploratory factor analysis (EFA). Common recommendations for this analysis were followed (e.g., Child, 2006; Tabachnick & Fidell, 2001; Worthington & Whittaker, 2006). Factor structure was first explored using principal components analysis (PCA) and assessed using four common strategies: eigenvalues, screeplot, parallel analysis (with PCA and assessment of 95% percentiles) and Velicer's (1976) MAP test (see O'Connor, 2000). This was followed by common factor analysis using principal axis factoring extraction (PAF) with oblique rotation (promax) in which items were constrained to load on the number of retained factors from the PCA. Structure coefficients, pattern coefficients and cross-loading were considered meaningful when > .30. These data analyses procedures matched those used by Stoeber et al (2014a).

Internal reliability was assessed using Cronbach's α using with recommendations of Cronbach's α > .70 indicating adequate reliability.

Results

Preliminary analysis

Due to missing data from individual responses (> 5%, more than one item), six participants were removed from sample one and five from sample two. Once these values were removed, there were 182 complete cases and 24 cases with incomplete data for sample one and 174 complete cases and 11 cases with incomplete data for sample two. In the cases of incomplete data, the number of missing data due to non-response was one item for both samples. Each missing item was replaced using the mean of each case's available non-missing items (i.e., their own mean score for the compete items on the PCI; Graham, Cumsille, & Elek-Fisk, 2003).

Assessment of previously proposed factor structures

Sample one was first used to test the proposed structures of Flett et al. (1998) and Stoeber et al (2014a). The results of these analyses are provided in Table 1. Flett et al.'s unidimensional structure consisted of 25-items and a single factor. Using CFA, the model provided less than adequate fit. Stoeber et al.'s (2014a) multidimensional structure consisted of 25-items and 3-factors: PCI-concerns (items 16, 1, 3, 11, 18, 22, 24 15, 10, 20), PCI-strivings (items 13, 23, 14, 12, 17, 25 19, 9, 6) and PCI-demands (items 7, 2, 5, 21, 8, 4)[3]. Using both CFA and ESEM, the model provided less than adequate fit. These analyses were repeated using sample two and provided similar results. Flett et al's (1998) unidimensional structure provided less than adequate fit and so did Stoeber et al.'s (2014a) multidimensional

[3] These are based on the loadings of the full set of the 25 items of the PCI reported in Table 1 of Stoeber et al (2014a).

structure when assessed using CFA. However, Stoeber et al.'s (2014a) structure provide adequate fit when assessed using ESEM.

Establishing a new unidimensional version of PCI

In deriving a new unidimensional version of the PCI, we first explored the underlying structure of the PCI in sample one. An initial PCA indicated that six eigenvalues were above 1 (λ_1 = 8.08, λ_2 = 2.21, λ_3 = 1.24, λ_4 = 1.16, λ_5 =1.08, λ_6 = 1.04) explaining 32.32%, 8.87%, 4.95%, 4.62%, 4.32% and 4.17% of variance. The scree plot suggested a two-component solution. Parallel analysis supported a two-factor solution as only the first and second eigenvalues were above the 95th percentile of the first and second random eigenvalues (λ_1 =1.82, λ_2 =1.68, λ_3 =1.57). Velicer's (1976) MAP test also supported retaining two factors. On this basis, in the PAF the number of factors restricted to two. Following promax rotation fifteen items loaded onto Factor 1 (loadings >.30; items 1, 3, 4, 7, 8, 10, 11, 15, 16, 18, 19, 20, 22, 24, 25) and eight items loaded onto Factor 2 (loadings >.30; items 5, 6, 9, 12, 13, 14, 21, 23) with one cross-loading item (item 17) and one non-loading item (item 2). The two factors were highly correlated r = .60. The results of these analyses are presented in Table 2. When this factor solution was tested using CFA, this two-factor model provided less than adequate fit: χ^2 (276) = 618.81, p <.001; χ^2/df = 2.23; RMSEA = .08 [.07, .09]; CFI = .77; TLI = .75; SRMR = .13; BIC = 15085.49. This was also the case when using ESEM which again provided less than adequate fit: χ^2 (251) = 441.03, p <.001; χ^2/df = 1.76; RMSEA = .06 [.05, .07]; CFI = .87; TLI = .85; SRMR = .05; BIC = 15018.32.

With the intention of identifying a new unidimensional version of the PCI, we explored this factor solution and alternate factor structures for different possible versions of the PCI. This was guided by, factor loadings, cross-loadings, and item content. It also included reference to the factor solution of Stoeber et al (2014) and the criticisms of Flett and Hewitt (2014) regarding item content. On this basis, we identified that a 10-item version consisting largely of items with higher factor loadings and minimal cross-loadings as the most replicable in regard to providing a single factor solution that was satisfactory in regard to exploratory, confirmatory and exploratory-confirmatory structure. The final EFA with principle axis factoring extraction for this version of the PCI (PCI-10) in samples one and two is provided in Table 3. In regard to CFA, the new model provided adequate fit in sample one. The adequate fit of the model was subsequently tested in sample two which again provided evidence to support the proposed factor structure. The results of these analyses are provided in Table 1.

In further support of the use of the PCI-10, it was highly correlated with the full-length version of the PCI in both samples (r = .94 and r = .94 p <.001). The internal reliability of the PCI-10 were also acceptable (Cronbach's α = .82 and α =.87)[4].

Discussion

The purpose of the study was to develop a new unidimensional version of the PCI. In doing so, we tested both the validity of the two factor structures of the PCI proposed by Flett et al. (1998) and Stoeber et al. (2014a), and explored the underlying factor structure and item content of the PCI.

Assessment of the previous factor structures of the PCI provided little support for the unidimensional factor structure proposed by Flett et al. (1998). This was the case using confirmatory analyses and when using exploratory analyses. As was found by Stoeber et al. (2014a), then, the PCI appears to include multiple underlying factors rather than a single factor within the 25-item scale. The multidimensional factor proposed by Stoeber et al. fared better but only received mixed support. Stoeber et al.'s factor structure did not provide

[4] Internal reliabilities for other versions of the instrument were PCI α = .91/.88 and PCI-concerns α = .86/.84, PCI-strivings α = .82/.77 and PCI-demands α = .74/.72 (sample one/sample two).

adequate fit in confirmatory analyses in ether sample one or two and did not provide adequate fit in exploratory-confirmatory analyses in sample one. However, it did provide adequate fit in exploratory-confirmatory analyses in sample two. As such, overall, our assessment suggests that the PCI is most likely multidimensional and, in contrasting the HF-MPCI with the PCI, the HF-MPCI more adequately captures the underlying structure of the instrument.

Our own exploration of the factor structure also revealed a multidimensional, albeit two-factor, structure. Factor one included all ten items from Stoeber et al.'s (2014a) PCI-concerns with the addition of three PCI-demands items and one PCI-strivings item (PCI-strivings/concerns/demands). Factor two included six PCI-striving items and two PCI-demands items (PCI-strivings/demands). This factor solution provided inadequate fit for the data in confirmatory and exploratory-confirmatory analyses. As such, it did not provide a satisfactory alternative multidimensional structure to the HF-MPCI. With this in mind, our analyses suggest that, in comparing an alternative multidimensional structure, the three-factor structure proposed by Stoeber et al. (2014a) is the most tenable.

In seeking to develop a unidimensional version of the PCI, we derived a shorter 10-item instrument. The PCI-10 provided superior fit in comparison to both the PCI and the HF-MPCI when assessed using confirmatory analyses and provided adequate fit more consistently when assessed using exploratory-confirmatory analyses. Importantly, the PCI-10 is also demonstrably unidimensional. It therefore offers better alignment with the theoretical framework proposed by Flett et al. (1998) and the notion that perfectionistic cognitions are a distinctive form of ruminative end-state thinking triggered by failure to obtain important goals. These perfectionistic cognitions do not include positive thoughts about the self or performance. Instead, they are characterised solely by a focus on personal deficiencies and inadequacies.

In closing it is important to note that the issues discussed in the current paper pertain to the use of the HF-MPCI. That is, the re-conceptualisation and measurement of perfectionistic cognitions in a manner that is inconsistent with the theoretical framework from which they were derived (Flett et al., 1998). It does not pertain to the MPCI (Kobori, 2006; Kobori & Tanno, 2004; Stoeber et al., 2010). Although originally couched within Hewitt and Flett's (1991; Flett et al., 1998) model, as noted by Flett and Hewitt (2014), the MPCI more likely offers a separate and alternative approach. Stoeber et al (2014b) have also subsequently argued that this is the case stating that the approaches should be considered complementary. The merits of the MPCI will need to be considered separately from the issues raised here regarding the HF-MPCI. However, if not couched within Hewitt and Flett's model, the MPCI will also need to find alternative theoretical grounding so researchers and practitioners can better understand multidimensional perfectionistic cognitions and the psychological processes that explain how they arise.

Limitations and future directions

There are several limitations of the current study worthy of consideration. First, the samples were recruited from sport. It is possible that the content of perfectionistic cognitions is to some degree shaped by the context. For example, thoughts concerning mistakes ("I can't stand to make mistakes") may be more salient in some contexts than others such as high-level sport versus social interactions. The PCI-10 will therefore need to be assessed in other contexts so to confirm its psychometric properties outside of sport (e.g., cross-contextual invariance). Adapting the PCI so to consider contextual differences is likely to improve predictive ability of the instrument so may ultimately be desirable. Secondly, a similar issue, the current study we focused only on establishing the factor structure of the PCI-10. Its other psychometric properties such as measurement invariance across different sample characteristics (e.g., gender, age, culture) and test-retest reliability will need to be examined in future research. These, too, are factors that will influence the validity of the PCI-10 and need to be examined in future research (see Stoeber, Kobori, & Tanno, 2013). Thirdly, we have assessed the validity of the PCI-10 in the absence of reference to external variables (divergent, convergent, and incremental validity). The high correlation between the PCI and PCI-10 provides some assurance that the two versions of the instruments will be similar. However, confirming that the PCI-10 encapsulates the core features of perfectionistic cognitions is necessary (e.g., automatic thoughts; Flett et al., 1998).

Summary

As described by Flett et al (1998), perfectionistic cognitions are unidimensional. However, evidence has been provided that the instrument developed to measure the frequency of perfectionistic automatic thoughts, the PCI, is multidimensional (Stoeber et al., 2014a). While there is more work to be undertaken, in the current study we provide evidence that the PCI-10 is a valid and reliable instrument to measure perfectionistic thoughts in the manner that was originally intended.

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Table 1

Confirmatory (CFA) and Exploratory-Confirmatory (ESEM) Factor Analyses of Perfectionism Cognitions Inventory

	χ^2	df	χ^2/df	CFI	TLI	RMSEA [90% CI]	SRMR	BIC
Sample one								
PCI	624.05*	275	2.27	.77	.75	.08 [.07, .09]	.08	15104.96
ESEM: HF-MPCI	399.55*	228	1.75	.89	.85	.05 [.05, .07]	.05	15068.42
CFA: HF-MPCI	537.97*	272	1.98	.82	.81	.07 [.06, .08]	.07	15020.60
PCI-10	71.34*	35	2.04	.94	.92	.07 [.05, .10]	.05	6108.95
Sample two								
PCI	681.80*	275	2.48	.70	.68	.08 [.08, .09]	.09	14740.16
ESEM: HF-MPCI	330.04*	228	1.45	.93	.90	.05 [.03, .06]	.05	14576.79
CFA: HF-MPCI	596.08*	272	2.19	.76	.74	.08 [.07, .08]	.09	14653.94
PCI-10	67.09*	35	1.92	.92	.90	.07 [.04, .09]	.06	6058.08

Note. PCI-25 = original unidimensional structure proposed by Flett et al. (1998); HF-MPCI = three factor structure of the PCI from Stoeber et al. (2014); PCI-10 = new 10-item unidimensional structure of PCI. Minor discrepancies between the results for Sample 1 and the results reported in Donachie et al (2018) are due to differences in preliminary analyses.

Table 2

Exploratory Factor Analyses of Perfectionism Cognitions Inventory (Sample 1)

Pattern coefficients (promax rotation)	F1	F2	h^2
16. Why can't things be perfect?	**.80**	-.12	.54
3. I should be perfect.	**.71**	-.06	.46
1. Why can't I be perfect?	**.69**	-.16	.37
11. People expect me to be perfect.	**.68**	-.13	.37
22. I can't do this perfectly.	**.65**	-.01	.41
10. No matter how much I do, it's never good enough.	**.62**	-.01	.38
19. My work should be flawless.	**.59**	.19	.51
15. I expect to be perfect.	**.59**	.13	.46
20. Things are seldom ideal.	**.58**	-.02	.32
18. It would be great if everything in my life were perfect.	**.54**	.05	.32
8. I can't stand to make mistakes.	**.51**	.17	.39
24. Maybe I should lower my goals.	**.50**	-.13	.19
25. I am too much of a perfectionist.	**.48**	.08	.28
17. My work has to be superior.	**.44**	**.33**	.47
7. I should be doing more.	**.41**	.16	.28
4. I should never make the same mistake twice.	**.39**	.14	.23
13. My goals are very high.	-.14	**.76**	.47
5. I've got to keep working on my goals.	-.16	**.67**	.35
9. I have to work hard all the time.	-.12	**.64**	.33
23. I certainty have high standards.	.03	**.64**	.43
14. I can always do better, even if things are almost perfect.	.12	**.55**	.31
6. I have to be the best.	.12	**.52**	.35
21. How well am I doing?	-.01	**.50**	.24
12. I must be efficient at all times.	.19	**.49**	.39
2. I need to do better.	.26	.26	.21

Note. F1 = Factor 1; F2 = Factor 2. r(F1, F2) = .60, p <.05; Substantial loadings (|loadings| > .30) are boldfaced.

Table 3

Final Exploratory Factor Analyses of Perfectionism Cognitions Inventory-10 (Sample one and two)

Pattern coefficients (promax rotation)	F1	h^2	F1	h^2
3. I should be perfect.	**.65**	.42	**.75**	.56
8. I can't stand to make mistakes.	**.66**	.43	**.49**	.24
10. No matter how much I do, it's never good enough.	**.60**	.36	**.57**	.33
12. I must be efficient at all times.	**.51**	.26	**.35**	.12
15. I expect to be perfect.	**.70**	.49	**.70**	.49
16. Why can't things be perfect?	**.66**	.44	**.64**	.41
17. My work has to be superior.	**.68**	.47	**.60**	.36
19. My work should be flawless.	**.72**	.52	**.67**	.46
22. I can't do this perfectly.	**.61**	.38	**.32**	.10
25. I am too much of a perfectionist.	**.55**	.30	**.46**	.21

Note. Sample one (n=200) to left. Sample two (n=213) to the right. F1 = Factor 1; Substantial loadings (|loadings| > .30) are boldfaced.