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Psychometric Properties of the Frost Multidimensional Perfectionism Scale With Australian Adolescent Girls

Clarification of Multidimensionality and Perfectionist Typology

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The psychometric properties of the Frost, Marten, Lahart, and Rosenblate Multidimensional Perfectionism Scale (1990) are investigated to determine its usefulness as a measurement of perfectionism with Australian secondary school girls and to find empirical support for the existence of both healthy and unhealthy types of perfectionist students. Participants were 409 female mixed-ability students from Years 7 and 10 in two private secondary schools in Sydney, Australia. Factor analyses yielded four rather than the six factors previously theorized. Cluster analysis indicated a distinct typology of healthy perfectionists, unhealthy perfectionists, and nonperfectionists. Healthy perfectionists were characterized by higher levels on Organization, whereas unhealthy perfectionists scored higher on the Parental Expectations & Criticism and Concern Over Mistakes & Doubts dimensions of perfectionism. Both types of perfectionists scored high on Personal Standards.

Keywords: *dimensions of perfectionism; perfectionist typology; perfectionist characteristics; scale validation*

Empirical studies have embraced a global conceptualization of perfectionism as a dichotomous construct redolent of Hamachek's (1978) description of *normal* and *neurotic* perfectionists. The former set high standards and are highly motivated by their need for achievement whilst, at the same time, recognizing and accepting their limitations in an attempt to reach their goals. Hamachek defined normal perfectionists as "those who derive a very real sense of pleasure from the labors of a painstaking

effort and who feel free to be less precise as the situation permits" (p. 27). These individuals seek approval in much the same way as everybody else; the positive feeling derived from this approval serves to heighten their own sense of well-being, and they feel encouraged to continue on and further improve their efforts.

Neurotic perfectionists, on the other hand, cannot accept any limitations in their efforts to attain the high standards they set for themselves. These individuals are driven more by a fear of failure than the pursuit of excellence and, as a result, fail to obtain satisfaction either with themselves or their performance (Hill, McIntyre, & Bacharach, 1997; Nugent, 2000; Pacht, 1984). Hamachek (1978) asserted that the efforts of neurotic perfectionists "never seem good enough, at least in their own eyes. . . . They are unable to feel satisfaction because in their own eyes they never seem to do things good enough to warrant that feeling" (p. 27).

A dual conceptualization of normal or *adaptive* perfectionism as contrasted with neurotic or *maladaptive* perfectionism was repeated throughout a number of early writings in the clinical literature (Adler, 1956; Burns, 1980a, 1980b; Hamachek, 1978; Hollender, 1965; Pacht, 1984). By the end of the 1980s, this theoretical distinction between adaptive and maladaptive forms of perfectionism captured the attention of researchers who became interested in substantiating the dichotomy through empirical studies.

Measuring Perfectionism

Initial efforts to define and measure perfectionism stressed the multidimensional nature of the construct in the development and validation of measurement instruments (Frost, Marten, Lahart, & Rosenblate, 1990; Hewitt & Flett, 1991; Terry-Short, Owens, Slade, & Dewey, 1995). Among these researchers, there was a collective emphasis on the conceptualization of perfectionists as having excessively high standards. Frost et al. (1990) claimed that these standards were accompanied by critically stringent self-evaluation in the form of doubting one's actions and being overly concerned with making mistakes. They also posited that perfectionists are unduly sensitive to parental criticism and expectations and tend to be preoccupied with an inflated need for order and organization.

Frost et al.'s (1990) multidimensional view of perfectionism aligns closely to the complex characteristics and behaviors ascribed to perfectionist school students. These include compulsiveness in work habits; overconcern for details; unrealistic high standards for self and others; indiscriminate acquiescence to external evaluation; and placing overemphasis on precision, order, and organization (Kerr, 1991). Because of this, we were particularly interested in the measurement instrument developed by Frost and his colleagues (1990), named the Multidimensional Perfectionism Scale, scores from which have been validated for both child and adult nonclinical populations (Ablard &

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Parker, 1997; Hawkins, Watt, & Sinclair, 2000; Kornblum, 2001; Parker & Adkins, 1995; Parker & Stumpf, 1995; Stöber, 1998). Frost et al.'s (1990) Multidimensional Perfectionism Scale, hereafter referred to as the FMPS as suggested by Flett, Sawatzky, and Hewitt (1995), was designed to assess six factors measuring perfectionism, based on an extensive review of the literature. These six factors are Concern Over Mistakes (CM), Personal Standards (PS), Parental Expectations (PE), Parental Criticism (PC), Doubts About Actions (D), and Organization (O).

The principal factor solution employed by the authors of the FMPS extracted the hypothesized six-factor structure of the instrument, which accounted for 54% of the variance. Other authors have found support for this structure using confirmatory factor analyses (CFAs) (Parker & Adkins, 1995; Parker & Stumpf, 1995), yet others have argued that the structure does not replicate across different samples (Purdon, Antony, & Swinson, 1999; Rhéaume, Freeston, Dugas, Letarte, & Ladouceur, 1995). Stöber (1998) claimed that neither the CM and D dimensions, nor the PE and PC dimensions, were factorially distinct. The convergence of CM with D (Concern Over Mistakes & Doubts [CMD]) and PE with PC (Parental Expectations & Criticism [PEC]) resulted in a four-factor structure based on Horn's (1965) parallel analysis. The achievement of this simple structure was believed to represent a more parsimonious description of perfectionism that was more robust across different populations (Stumpf & Parker, 2000). Although the same four-factor structure was supported based on parallel analysis by Stumpf and Parker (2000), and more recently by Harvey, Pallant, and Harvey (2004) with adults in the Australian context, researchers have called for further research on the factorial structure of the instrument across diverse samples. Our observation is that much of the nonclinical work using the FMPS has been conducted with academically gifted participants and college students and that there is a need to include samples that span a broader ability and age spectrum.

There has been some debate regarding the inclusion of the O subscale as part of the FMPS measure. Frost et al. (1990) did not include O in their overall FMPS perfectionism score, due to its weak correlation with the other subscales. However, in their multidimensional conceptualization, the authors included the need for order and organization because of the frequency with which it has appeared in the literature as a common characteristic of the perfectionist. On substantive grounds, it would seem that its inclusion is justified. In this study, there was a moderately strong association between the O and PS subscales, lending empirical support for retention of the O factor.

The calculation of an overall global perfectionism score as suggested by Frost et al. (1990) may be problematic on both theoretical and empirical grounds. A theorized, multidimensional conceptualization of a construct is at odds with the notion of calculating a unidimensional score. It would seem unproductive to calculate a global score of perfectionism when the perfectionism scales themselves include content that has both positive and negative concomitants, any combination of which may contribute to the unique profile of a perfectionist individual (Bieling, Israeli, Smith, & Antony, 2003). Additionally, studies incorporating a global score of perfectionism have not reported any empirical confirmation for a one-factor solution from analyses of scores

yielded by the FMPS (Frost et al., 1990; Parker, 1997; Parker & Adkins, 1995; Stöber, 1998).

A similar stance was taken by Stumpf and Parker (2000), who argued that it makes little sense to compute a single global perfectionism score from the FMPS, given their conclusion that two higher order healthy and unhealthy perfectionism factors best summarized the set of four first-order factors. Although statistical significance levels were not reported by Stumpf and Parker for correlations between perfectionism factors and personality outcomes, inspection of the coefficients showed that two of the first-order factors, Concerns & Doubts (CD) and Parental Pressure (PP), related differentially to self-esteem as measured by the Rosenberg Self-Esteem Scale (Rosenberg, 1965). Whereas CD related moderately strongly to self-esteem (–.58), PP showed a much lower correlation (–.28) to self-esteem. Similarly, the O factor appeared to have a somewhat higher association with the personality characteristics of endurance (.35) and order (.35) scales of the Adjective Check List (Gough & Heilbrun 1983) than with PS (.23 and .26, respectively). O and PS also differently predicted conscientiousness, with O more strongly related (.52) than PS (.39). In light of these differential correlations between the four first-order factors of the FMPS and measures of various personality constructs, the predictive validity of the four factors may best be preserved by their retention in any detailed examination of the perfectionism construct using the FMPS.

Measures of Healthy Versus Unhealthy Perfectionism

Other researchers have focused on a conceptual distinction between *healthy* and *unhealthy* perfectionism. Theorists have equated the behavioral consequences of positive strivings (e.g., high standards, persistence, and conscientiousness) with a positive form of perfectionism that, according to Hamachek (1978), contributes to high levels of achievement and motivation (Accordino, Accordino, & Slaney, 2000). In contrast to healthy perfectionist strivings for success, unhealthy perfectionists were seen to be driven by an overwhelming need to avoid failure (Blatt, 1995) and tending to be overcritical in evaluating their performance (Frost et al., 1990). Unhealthy perfectionists were seen to rarely feel good about their achievements (Hamachek, 1978) and, more often than not, to feel inadequate (Burns, 1980a) or suffer from negative affect (Blatt, 1995) in achievement situations.

Previous studies have also suggested an empirical distinction between healthy and unhealthy dimensions of perfectionism. Frost and colleagues (Frost, Heimberg, Holt, Mattia, & Neubauer, 1993) combined the six subscales from the FMPS with the three subscales from the HMPS (the Multidimensional Perfectionism Scale developed by Hewitt & Flett, 1991) in a principal components factor analysis. The HMPS contains three major dimensions of perfectionism: (a) self-oriented perfectionism, involving expectations of self-perfection; (b) other-oriented perfectionism, involving expectations of perfection in others; and (c) socially prescribed perfectionism, involving perceptions of others as expecting oneself to be perfect (Hewitt et al., 2002). Both orthogonal and oblique rotations on scores yielded by the FMPS and HMPS scales

produced two distinct higher order factors that Frost et al. (1993) named Positive Strivings and Maladaptive Evaluation Concerns. PS, O (FMPS), Self-Oriented Perfectionism, and Other-Oriented Perfectionism (HMPS) were associated with the positive factor, whereas CM, PC, PE, D (FMPS), and Socially Prescribed Perfectionism (HMPS) formed the negative factor.

Similarly, Stumpf and Parker (2000) argued for two higher order factors based on an exploratory approach of a principal components factor analysis of the six subscales of the FMPS, with PS and O comprising the healthy and CD and PP the unhealthy dimensions. It is important to note that their correlations between component factors comprising higher order constructs were not especially strong (.28 for O and PS, .42 for CD and PP), when considered from the proposed positive/negative higher order perspective. Within that same study, evidence for the predictive validity of the healthy and unhealthy dichotomy was also presented. Positive correlations were found between the healthy factors (PS and O) and conscientiousness, whereas the unhealthy factors (CD and PP) correlated with low self-esteem. This was taken as further support for the existence of higher order healthy versus unhealthy perfectionism factors on the FMPS, although importantly, first-order component factors for the higher order constructs differently predicted several outcomes, as we have discussed. It is timely that the validity of the proposed higher order healthy and unhealthy FMPS perfectionism constructs be assessed in additional studies and across diverse samples through the use of nested CFAs that simultaneously assess the fit of scale items to the first-order constructs and these, in turn, to the higher order factors.

A Perfectionist Typology

In contrast to the proposed higher order healthy and unhealthy perfectionism *constructs*, other researchers have argued for a tripartite typology of perfectionist *individuals*. Scores on the FMPS have been used in a number of cluster analytic studies of perfectionism in which support has been found for such a typology. Parker (1997) identified two perfectionist clusters and a third nonperfectionist cluster in his study of academically talented youth. He described the first cluster as nonperfectionists who obtained low scores on PS, PE, and O as well as for total perfectionism (P), which represented an aggregate of scores on each perfectionism dimension. Low scores on CM, PC, and D; moderate PS; and high O scores were taken to indicate a healthy perfectionist cluster. Students falling into the third cluster group were referred to as dysfunctional perfectionists because they obtained the highest scores on the CM, PS, PE, PC, and D subscales as well as total P on the FMPS. The FMPS was also used in a number of studies of college students (Rice & Dellwo, 2002; Rice & Lapsley, 2001; Rice & Mirzadeh, 2000; Slaney, Rice, & Ashby, 2002), where researchers found similar results with two perfectionist clusters (adaptive and maladaptive) and a third nonperfectionist cluster.

Although the perfectionist typology was supported across each of these cluster analytic studies, the representation of the dimensional subscales of the FMPS in each cluster contained some notable differences. Higher levels of PS were found in the

unhealthy cluster in the Parker (1997) and Rice and Mirzadeh (2000) studies and in *both* the unhealthy and healthy clusters by Rice and Lapsley (2001), whereas Rice and Dellwo (2002) reported that the healthy cluster obtained the highest scores on this subscale. All four studies reported that the highest scores on O were obtained by the healthy cluster. The unhealthy cluster generally scored highest on the CM, D, PE, and PC subscales, although Rice and Dellwo found that their healthy cluster had higher PE than PC scores, demonstrating that healthy perfectionists perceived their parents to hold high expectations for their success accompanied by perceived lower levels of criticism. The effect of perceptions of parental influences on self-esteem was also noted by Stumpf and Parker (2000), who found that scores on PE were not as strongly related to lack of self-esteem as were the scores on PEC. They consequently cautioned against a possible loss of information if both parental scales were collapsed into one.

Two Australian studies also found evidence for the three-cluster perfectionist typology based on an examination of the four FMPS dimensions as proposed by Stöber (1998). In our study of Australian secondary school students (Hawkins et al., 2000), we found that both the healthy and unhealthy clusters had the highest PS scores, similar to Rice and Lapsley's (2001) study of college students. In contrast, and similar to Rice and Mirzadeh's (2000) findings, Kornblum's (2001) study of Australian gifted school students identified unhealthy perfectionists as scoring highest on PS, followed by the healthy perfectionists, who reported moderate levels of PS and a very high need for order and organization. There is a lack of consistency regarding the role of PS in the psyche of the perfectionist individual. How does one account for the fact that across these studies, each of the healthy and unhealthy perfectionists was characterized by the setting of high personal standards? On the other hand, it is interesting to note that high scores on the O scale of the FMPS were consistently obtained by the healthy perfectionist groups across all of these cluster analytic studies.

There is, then, increasing support for a typology of healthy perfectionism, unhealthy perfectionism, and nonperfectionism. A number of issues, however, remain unsolved. These include whether high PS typifies both healthy and unhealthy perfectionists or the healthy cluster alone, whether the O subscale should be included in the measurement of perfectionism, and whether perfectionism itself is better represented by two higher order factors. There is a continuing need to examine the concept of perfectionism and its measurement in more diverse populations with particular emphasis on the FMPS core components of perfectionism in providing a detailed description of a perfectionist profile and determining whether the setting of high standards is a characteristic of both healthy and unhealthy perfectionist types.

The Study

A number of empirical studies have examined the presence of perfectionism in school-aged children, but these have either been limited to gifted populations or tended to focus on the negative aspects of perfectionism (Bieling et al., 2003; Einstein, Lovibund, & Gaston, 2000; Kornblum, 2001; LoCicero & Ashby, 2000; Parker, 1997; Parker, Portešová, & Stumpf, 2001; Parker & Stumpf, 1995). We extend on this body of work by examining the dimensionality of the perfectionism construct in a sample of

Australian adolescent girls in Years 7 and 10 in secondary schools and incorporating a broader spectrum for student ability in a naturally occurring ecological setting.

In Australia, there has been little empirical research into the manifestation of perfectionist behaviors, healthy or unhealthy, in the daily learning experiences of typical secondary school students. An initial investigation into the construct of perfectionism necessitates an examination of the psychometric properties of a measurement of perfectionism to clarify existing theories on the multidimensional nature of the construct and on the existence of healthy and unhealthy types of perfectionists. The purpose of this study was therefore to extend previous studies of perfectionism conducted outside Australia through an examination of the psychometric properties of FMPS scores. Our first objective was to determine the number and nature of the core components of perfectionism as theorized by Frost et al. (1990) and to examine support for the presence of two higher order factors representing positive and negative aspects of perfectionism. We also aimed to establish an empirical base for the existence of a typology of perfectionist students and to determine whether holding high personal standards could be attributable to both healthy and unhealthy perfectionists.

We examined the validity of first-order FMPS factors through exploratory factor analytic procedures as a conservative confirmatory approach (Gorsuch, 1983). Furthermore, we tested the validity of recently proposed higher order healthy and unhealthy perfectionism factors using nested CFA, simultaneously assessing first- and higher order factor fits as a direct test of the hierarchy proposed by Stumpf and Parker (2000).

Using factor scores on the FMPS, we also aimed to investigate whether a typology of healthy perfectionist, unhealthy perfectionist, and nonperfectionist students was empirically identifiable. On the basis of prior cluster analytic studies (Kornblum, 2001; Parker, 1997; Parker et al., 2001; Rice & Dellwo, 2002; Rice & Lapsley, 2001; Rice & Mirzadeh, 2000; Slaney et al., 2002), we hypothesized that profiles of scores on the dimensions of the FMPS would enable the identification of three distinct cluster groups. It was expected that a healthy perfectionist cluster would emerge in which students would score highest on the PS and O subscales. Unhealthy perfectionists were expected to obtain high scores on PS and the highest scores on CM, D, PE, and PC. The nonperfectionist cluster was expected to demonstrate moderate to low levels of perfectionism across all dimensions of the FMPS.

Method

Participants and Procedure

Participants for the study were 409 mixed-ability female students from Years 7 and 10 in two private secondary girls' schools in the Sydney metropolitan area. The majority of students attending private schools in Sydney are from middle to upper socioeconomic status backgrounds. The sample included girls from a number of non-English-speaking backgrounds (Southeast Asia, 8.07%; Europe, 8.6%; Middle East, 1.71%;

South Africa, 0.98%; and South America, 0.49%), which reflects the multicultural nature of Australian society.

The participants were told that the purpose of the study was to obtain firsthand information about how students viewed their learning experiences and that only the generalized findings would be reported to educators and researchers concerned with the provision of optimal school learning environments. All the girls completed the FMPS, consisting of 35 statements to which participants responded on a 5-point Likert scale ranging from 1 *(not at all true)* through 5 *(very true)*. This self-report questionnaire has been designed to produce scores for six subscales: CM, PS, PE, PC, D, and O, for which Frost et al. (1990) reported six subscale alphas ranging from .77 to .93. The original scale was adapted for the study by changing 7 items that were originally worded in the past tense into the present tense to make them more meaningful to participants' current experiences. These items related to perceptions of parental expectations and criticism (e.g., Item 11, "My parents wanted me to be the best at everything" was changed to "My parents want me to be the best at everything").

Following ethics approval by the New South Wales (NSW) Department of Education and Training and the informed consent of school principals, data were obtained during the first half of the academic school year. The researcher and class teachers administered the FMPS to intact class groups. Only girls with parental consent to participate in the study completed the questionnaire (approximately 82%), which took between 10 and 15 minutes.

Data Analysis

Dimensions of perfectionism. A combination of exploratory and confirmatory procedures was employed to confirm the factorial stability of the FMPS. An exploratory factor analysis (EFA) with maximum likelihood extraction and direct oblimin rotation (delta = 0) was used first to explore the factorial structure as a conservative confirmatory approach (Gorsuch, 1983). Cronbach alpha reliabilities determined internal consistency for scores on the resulting factors. A CFA was subsequently applied to this factor solution, using robust maximum likelihood, where all items were specified to load only on their respective factors, no error covariances were permitted to correlate, and correlations between the latent constructs were estimated freely.

CFA fit statistics as well as modification indices were taken into account in evaluating the fit of the CFA. Most investigators encourage reporting multiple indices of overall fit (Bollen, 1989; Hu & Bentler, 1995; Marsh, Balla, & McDonald, 1988; Tanaka, 1993). The fit indices used in the present study include χ^2, the RMSEA (root mean square error of approximation), NFI (normed fit index), and NNFI (nonnormed fit index). Acceptable model fits are indicated by RMSEAs smaller than .10, NFIs and NNFIs close to or exceeding .90, and χ^2:*df* ratio near to 2.

To assess the validity of possible higher order "positive" and "negative" perfectionism factors, a nested CFA was conducted. Here, items were specified as indicators for first-order factors as in the preceding analysis (with the same error covariance freely estimated). First-order "positive" PS and O factors were specified as equally contrib-

uting indicators for a latent "positive perfectionism" factor, and first-order PEC and CMD factors specified as equally contributing indicators for a latent "negative perfectionism" factor. Intercorrelations were freely estimated, and robust maximum likelihood was again used.

Perfectionist typology. Cluster analysis determined whether there were identifiable typologies of perfectionistic students based on their FMPS factor scores, using Ward's method and squared Euclidean distance. The selection of number of clusters was based both on the a priori theorization of two perfectionist groups (Hamachek, 1978) and a nonperfectionist group (Kornblum, 2001; Parker, 1997; Parker et al., 2001; Rice & Dellwo, 2002; Rice & Lapsley, 2001; Rice & Mirzadeh, 2000; Slaney et al., 2002), as well as empirically based on inspection of the cluster dendogram and relative changes in the fusion coefficient (Hair, Anderson, Tathan, & Black, 1995; Kim & Mueller, 1984). MANOVA tested where differences in cluster group means on perfectionism factors were statistically significant ($p < .05$), and post hoc comparisons using Tukey's *a* located statistically significant differences between cluster pairs. There were no missing data for individuals or items.

Results

Dimensions of Perfectionism

Several researchers have been concerned with the factorial instability of the FMPS due to a number of solutions where items did not load on the factors to which they had initially been assigned (Frost et al., 1990; Parker & Adkins, 1995; Purdon et al., 1999; Rhéaume et al., 1995; Stöber, 1998). In our study, as in others, a four-factor model best fitted the data, rather than the six factors initially proposed by Frost and colleagues (1990). The four-factor model comprised 33 rather than the full set of 35 items, due to cross-loadings identified for Items 16 and 18. In both our analyses and previous studies outside Australia, Item 16, "I am very good at focusing my efforts on attaining a goal" (PS), and Item 18, "I hate being less that the best at things" (CM), were identified as problematic as they both loaded on more than one factor (Parker & Adkins, 1995; Rhéaume et al., 1995; Stöber, 1998). In the present analysis, Item 16 had almost equal pattern coefficients for both PS and O (.39 and .34, respectively), whereas Item 18 loaded on both CMD (.42) and PS (.38).

Our four-factor, 33-item model was subjected to maximum likelihood extraction with oblimin rotation (delta = 0). This four-factor solution accounted for 48% of the variance, and the resulting matrix of pattern and structure coefficients is shown in Table 1, along with Cronbach's alpha measures of internal consistency for scores on each factor. All items for PE and PC loaded on Factor 1, which was termed PEC. Factor 2 retained items relating to O, and Factor 3 retained items relating to PS. Items for CM and D items loaded on Factor 4, termed CMD. The abbreviations CMD and PEC are taken from Stöber and Joorman (2001). Other researchers have used different

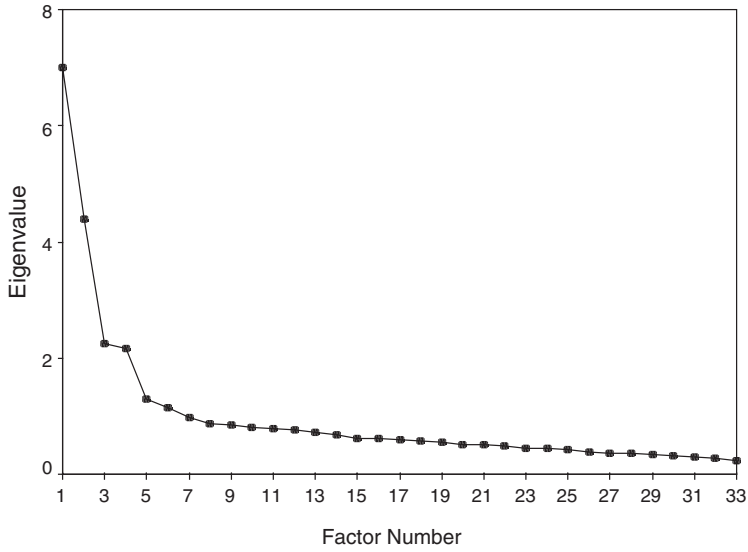
Table 1
FMPS Items, Pattern/Structure Coefficients, and Cronbach's Alpha Subscale Score Reliabilities for Four-Factor Solution (Maximum Likelihood Extraction and Oblimin Rotation)

Item No.	Item	Pattern/Structure Coefficients for Each Factor			
		PEC (α = .85)	O (α = .87)	(PS α = .76)	CMD (α = .83)
20	My parents expect excellence from me	**.773/.755**	.079/.040	.179/.329	–.100/.272
11	My parents want me to be the best at everything	**.692/.689**	–.021/–.053	.174/.291	–.087/.255
1	My parents set very high standards for me	**.678/.644**	.003/–.002	.265/.365	–.193/.158
35	I never feel that I can meet my parents' standards	**.662/.706**	–.007/–.147	–.274/–.106	.217/.465
26	My parents have always had higher expectations for my future than I have	**.649/.635**	.031/–.081	.194/–.048	.062/.316
15	Only outstanding performance is good enough in my family	**.626/.687**	–.053/–.106	.091/.219	.085/.385
22	I never feel that I can meet my parents' expectations	**.586/.653**	–.009/–.141	–.260/–.099	.262/.479
3	As a child, I was punished for doing things less than perfectly	**.399/.472**	–.053/–.102	.013/.106	.145/.330
5	My parents never try to understand my mistakes	**.341/.423**	–.088/–.159	–.102/–.016	.206/.346
7	I am a neat person	.006/–.103	**.775/.780**	.007/.153	–.066/–.114
29	Neatness is very important to me	.121/.074	**.767/.752**	.008/.200	.073/.077
31	I am an organized person	–.036/–.120	**.736/.763**	.095/.227	–.057/–.106
2	Organization is very important to me	–.100/–.103	**.733/.758**	.110/.259	.117/.042
27	I try to be a neat person	.065/–.008	**.669/.646**	–.074/.079	.028/–.001
8	I try to be an organized person	–.089/–.136	**.637/.661**	.077/.190	.012/–.057
12	I set higher goals than most people	–.016/.125	.033/.185	**.740/.743**	–.005/.118
19	I have extremely high goals	.055/.165	.067/.184	**.605/.629**	–.005/.123
30	I expect higher performance in my daily tasks than most people	.154/.291	.071/.172	**.599/.654**	.058/.229
24	Other people seem to accept lower standards from themselves than I do	–.066/.074	.017/.121	**.514/.520**	.090/.151
6	It is important to me that I be thoroughly competent in what I do	.032/.084	.217/.301	**.425/.471**	–.020/.055
4	If I do not set the highest standards for myself, I am likely to end up a second-rate person	.053/.185	.060/.121	**.376/.424**	.142/.229
33	It takes me a long time to do something "right"	–.047/.195	–.031/–.090	–.123/–.034	**.588/.547**
14	If I fail partly, it is as bad as being a complete failure	.012/.314	–.084/–.087	.182/.270	**.575/.618**
9	If I fail at school, I am a failure as a person	.096/.384	–.027/–.047	.146/.261	**.573/.644**
17	Even when I do something very carefully, I often feel that it is not quite right	–.061/.166	.094/.051	–.061/.045	**.556/.512**

28	I usually have doubts about the simple everyday things that I do	.024/.248	.065/.021	–.031/.081	**.531/.532**
13	If someone does a task at school better than I do, then I feel as if I failed the whole task	.032/.316	–.010/.000	.244/.341	**.524/.582**
23	If I do not do as well as other people, it means I am an inferior being	.106/.338	.101/.066	.054/.188	**.517/.568**
25	If I do not do well all the time, people will not respect me	.086/.368	–.169/–.146	.310/.374	**.453/.558**
10	I should be upset if I make a mistake	.038/.285	–.053/–.037	.246/.319	**.433/.497**
21	People will probably think less of me if I make a mistake	.126/.355	–.108/–.105	.212/.285	**.393/.494**
34	The fewer mistakes I make, the more people will like me	.155/.365	–.087/–.102	.138/.220	**.388/.488**
32	I tend to get behind in my work because I repeat things over and over	.040/.187	.025/–.023	–.091/–.012	**.374/.374**

Note: FMPS = Frost, Marten, Lahart, and Rosenblate's (1990) Multidimensional Perfectionism Scale; PEC = Parental Expectations & Criticism; O = Organization; PS = Personal Standards; CMD = Concern Over Mistakes & Doubts. Numbers in boldface denote coefficients for each of the four factors.

Figure 1
Scree Plot for Four-Factor Exploratory Factor Analysis



names and labels for the same combinations: for example, the Parker/Stumpf group called the combination of PE and PC, PP.

The question of how many factors to retain in exploratory factor analysis is crucial to the final solution (Gorsuch, 1983). A six-factor model, including the full set of 35 items and based on maximum likelihood extraction and oblimin rotation (delta = 0), showed factorial instability, with various items having similar pattern coefficients across several factors, indicating a possible problem with overextraction. Factor intercorrelations ranged from –.41 through .26, with a median correlation of –.02. Although six eigenvalues exceeded unity and explained 54% of the variance, the last two eigenvalues were close to unity (1.31 and 1.15) and the Cattell scree test (Cattell, 1966) also indicated only four clear factors (see Figure 1).

A CFA, specifying the four factors supported through the EFA (PEC, CMD, PS, and O) and containing 33 items, converged in 11 iterations and exhibited marginal fit (normal theory weighted least squares chi-square = 1,409.51, *df* = 489, RMSEA = .07, NFI = .90, NNFI = .93). A large modification index (83.92) suggested freeing the error covariance between Items 22 and 35, which contained parallel wording that differed only for the last word (see Table 1). We consequently set this error covariance to be freely estimated in a second CFA, which was otherwise identical to the first. This model converged in 10 iterations, and fit statistics for this revised CFA were improved (normal theory weighted least squares chi-square = 1,253.68, *df* = 488, RMSEA = .06, NFI = .90, NNFI = .94), with no large modification indices (the largest was 37.28 for the error covariance between Items 17 and 28, whereas the highest modification index for lambda *x* was 24.13), suggesting that no items cross-loaded across factors. Com-

Table 2
Correlations Between Latent Constructs

Factor	PEC	CMD	PS	O
PEC	—			
CMD	.60*	—		
PS	.29*	.40*	—	
O	–.08	–.04	.33*	—

Note: PEC = Parental Expectations & Criticism; CMD = Concern Over Mistakes & Doubts; PS = Personal Standards; O = Organization.
*$p < .01$.

pletely standardized item factor loadings (LX: lambda *x*) ranged from .32 through .78, with median and modal loading .63 ($M = .61$, $SD = .12$). Measurement errors (TD: theta delta) ranged from .40 through .90, with median loading .61 and modal loading .40 ($M = .62$, $SD = .14$); and the estimated error covariance was .29. Correlations between the latent constructs are shown in Table 2.

Because it is not entirely satisfactory to perform a CFA on the same sample as our EFA, we also estimated a six-factor CFA as proposed by the test authors (Frost et al., 1990), but omitting problematic Items 16 and 18 as previously. Although this model exhibited similar fit to the four-factor CFA (normal theory weighted least squares chi-square = 932.94, $df = 480$, RMSEA = .05, NFI = .92, NNFI = .96), there were large modification indices for the pattern of factor loadings (the highest was 53.55, for Item 26 to cross-load on the PC factor). This, taken alongside our recent corroborating evidence from an independent sample (Hawkins, 2005), and other studies that have found a four-factor model to be a better fit, decided us in proceeding with the four-factor model.

The nested CFA that assessed the validity of higher order healthy and unhealthy perfectionism factors showed marginal model fit and converged in 34 iterations (normal theory weighted least squares chi-square = 1,402.49, $df = 491$, RMSEA = .07, NFI = .89, NNFI = .93). Although these fit indices aid in the evaluation in model fits, there is ultimately a degree of subjectivity and professional judgment in the selection of "best" models. Inspection of interrelations between healthy PS and O components (.33) and unhealthy CMD and PEC components (.60; see Table 2), shows these were no stronger often than across-construct correlations, and for the healthy perfectionism factor the correlation was not strong in any case. This was also the case in the Stumpf and Parker (2000) study, despite their conclusion favoring two higher order positive and negative factors.

In evaluating hierarchical CFA models, it has been argued by Marsh and colleagues that weak correlations among first-order factors imply a weak hierarchy (Marsh, 1987; Marsh & Hocevar, 1985) because most of the reliable variance in the first-order factor scores is unexplained by the higher order factors. This is an important decision in deciding whether to summarize data using higher order constructs or to rely on the greater number of first-order factors. As shown in Table 3, PS correlated most strongly

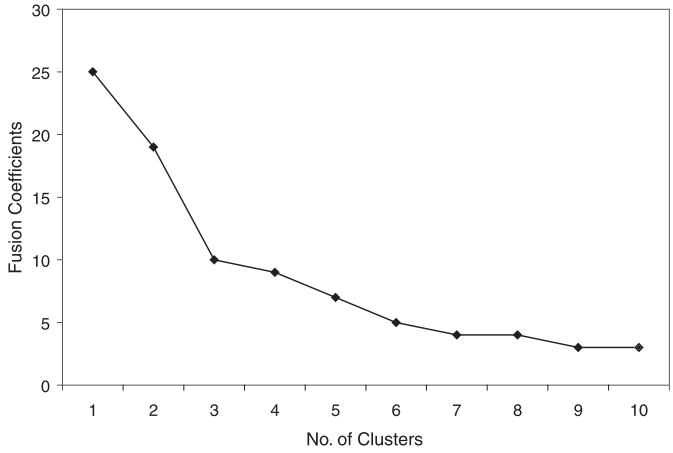
Table 3
Nested Confirmatory Factor Analysis: First-Order Factor Loadings and Measurement Errors, and Higher Order Factor Loadings and Uniquenesses (Completely Standardized Solution)

Higher Order Factor	Scale/Item No.	LY	TE	GA	PSI
Negative perfectionism (α = .66)	PEC			.74	.46
	1	.65	.58		
	3	.50	.75		
	5	.44	.80		
	11	.70	.51		
	15	.72	.49		
	20	.77	.41		
	22	.59	.65		
	26	.61	.63		
	35	.65	.59		
	CMD			.78	.39
	9	.64	.59		
	10	.52	.73		
	13	.61	.63		
	14	.63	.60		
	17	.40	.84		
	21	.54	.71		
	23	.57	.68		
	25	.62	.62		
	28	.44	.80		
	32	.31	.91		
	33	.43	.82		
	34	.52	.73		
Positive perfectionism (α = .45)	PS			.95	.10
	4	.31	.91		
	6	.50	.75		
	12	.79	.38		
	19	.68	.54		
	24	.56	.69		
	30	.65	.58		
	O			.72	.48
	2	.86	.26		
	7	.86	.27		
	8	.77	.41		
	27	.74	.46		
	29	.84	.30		
	31	.86	.27		

Note: Error covariance between Items 22 and 35 = .30. LY = First-Order Factor Loadings; TE = Measurement Errors; GA = Higher Order Factor Loading; PSI = Uniqueness; PEC = Parental Expectations & Criticism; CMD = Concern Over Mistakes & Doubts; PS = Personal Standards; O = Organization.

with CMD, one of the negative perfectionism factors (.40), and correlated similarly with PEC, the other negative factor (.29) and O, a positive factor (.33). Cronbach's alpha measures of internal consistency were .45 for the healthy and .66 for the

Figure 2
Fusion Coefficients Plotted by Number of Clusters



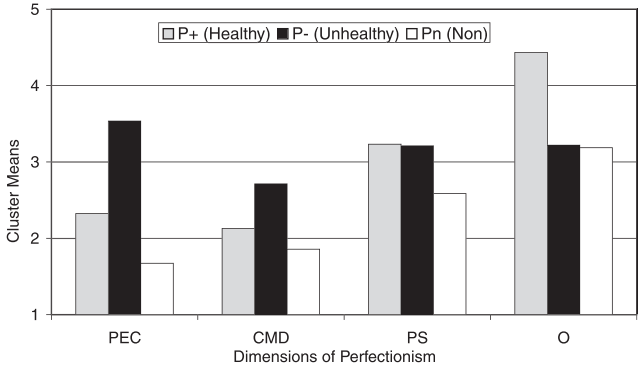
unhealthy higher order factors. Table 3 shows first-order factor loadings and measurement errors and higher order factor loadings and uniquenesses from the nested CFA. Based on the weak correlations within proposed higher order factors, relative to across-construct correlations, low measures of internal consistency, and marginal model fit, the presence of two higher order healthy (PS and O) and unhealthy (CMD and PEC) factors was rejected.

Perfectionist Typology

To examine whether individuals could be classified into healthy perfectionist (P+), unhealthy perfectionist (P–), and nonperfectionist (Pn) groups, cluster analysis was employed. This is a multivariate data analytic technique that is useful for identifying homogeneous subtypes within a complex data set (Borgen & Barnett, 1987). Individuals' responses for the four FMPS subtest scores were analyzed using hierarchical cluster analysis, employing Ward's method, designed to optimize the minimum variance within clusters (Ward, 1963). Based on prior research (Kornblum, 2001; Parker, 1997; Parker et al., 2001; Rice & Lapsley, 2001; Rice & Mirzadeh, 2000; Slaney et al., 2002), visual inspection of the dendogram, and inspection of relative change in the fusion coefficient with increasing number of clusters (see Figure 2), three clusters were identified. Mean scores for the three clusters on the four first-order perfectionism factors are presented in Figure 3.

As shown in Figure 3, cluster 1 students ($n = 96$) were characterized on the FMPS by having the highest scores on PEC and CMD and so were termed unhealthy perfectionists (P–). Cluster 2 students ($n = 106$) exhibited the lowest scores of the three clusters and were labeled nonperfectionists (Pn). Cluster 3 students ($n = 207$) demon-

Figure 3
Mean Perfectionism Scores for Healthy Perfectionist, Unhealthy Perfectionist, and Nonperfectionist Clusters



Note: PEC = Parental Expectations & Criticism; CMD = Concern Over Mistakes & Doubts; PS = Personal Standards; O = Organization.

strated low scores on PEC and CMD, high scores on PS, and the highest scores on O. Cluster 3 was therefore labeled healthy perfectionists (P+).

To validate the three-cluster solution, MANOVA was performed on the dependent set of perfectionism subscale scores (PEC, O, PS, CMD), with cluster membership as the grouping variable, and Tukey *a* post hoc tests for paired comparisons. Univariate tests showed statistically significant cluster effects on each of the four perfectionism factors: PEC, $F(2,406) = 264.96$, $p < .001$; CMD, $F(2,406) = 49.64$, $p < .001$; O, $F(2,406) = 180.25$, $p < .001$; PS, $F(2,406) = 25.10$, $p < .001$. For PEC and CMD, the P– cluster scored statistically significantly higher than P+, and P+ scored statistically significantly higher than Pn (PEC: P– $M = 3.54$, $SD = 0.66$; P+ $M = 2.32$, $SD = 0.62$; Pn $M = 1.67$, $SD = 0.40$; CMD: P– $M = 2.71$, $SD = 0.74$; P+ $M = 2.13$, $SD = 0.62$; Pn $M = 1.86$, $SD = 0.51$). For PS, P– and P+ ratings were similar, and each scored statistically significantly higher than the Pn cluster (P– $M = 3.21$, $SD = 0.84$; P+ $M = 3.23$, $SD = 0.74$; Pn $M = 2.59$, $SD = 0.88$), suggesting high personal standards may be a characteristic of *both* types of perfectionists. For O, the P+ cluster had statistically significantly and substantially higher scores than both the P– and Pn clusters, whose ratings were similar to each other (P+ $M = 4.43$, $SD = 0.37$; P– $M = 3.22$, $SD = 0.97$; Pn $M = 3.19$, $SD = 0.74$) (indicated by Tukey *a* post hoc tests; see Figure 3), which may suggest O is the positive characteristic that distinguishes healthy from unhealthy perfectionists, along with negative PEC and CMD factors. The similarity of P+ and P– scores on PS supports the notion that high PS is a dominant characteristic of perfectionism and common to both healthy and unhealthy perfectionists.

Discussion

The Multidimensional Perfectionism Construct

The aim of this study was to investigate the psychometric properties of the FMPS as a measurement of perfectionism in Australian female secondary school students and to determine an empirically identifiable typology for perfectionist students. A combination of EFA and CFA established the presence of four underlying dimensions of perfectionism. The findings of this study support previous assertions that the FMPS is more stable with four underlying dimensions, rather than the original six theorized by Frost et al. (1990). This solution concurs with Hawkins et al. (2000), Kornblum (2001), Stöber (1998), and Stumpf and Parker (2000), in which the CM and D subscales combined to form a new subscale CMD, and the PE and PC subscales together formed a second new subscale PEC.

It has been argued that previous studies of perfectionism have emphasized negative effects and that researchers interested in its positive aspects should continue to include the O subscale in their analyses (Stöber, 1998; Terry-Short et al., 1995). This subscale was originally dropped by Frost et al. (1990) because of its weak correlation with the other subscales. In our study there was a statistically significant relationship between O and PS (.33). A number of researchers have included the FMPS subscales of O and PS into measures of healthy perfectionism (Frost et al., 1993; Parker & Stumpf, 1995; Rice, Ashby, & Slaney, 1998), whereas others include PS only (Dunkley, Blankstein, Halsall, Williams, & Winkworth, 2000; Lynd-Stevenson & Hearne, 1999). The results of our study support the retention of the O subscale, for a number of empirically and theoretically driven reasons. Most important, this was the positive factor that discriminated between healthy and unhealthy perfectionists. Anecdotal claims that perfectionists emphasize precision, order, and organization (Frost et al., 1990; Hollender, 1965; Kerr, 1991) would therefore appear to relate to characteristics of healthy perfectionists. Indirect support for this hypothesis comes from another Australian study, involving a sample of university students, which found that high organizational perfectionism was associated with low levels of distress (Lynd-Stevenson & Hearne, 1999). This would be consistent with our interpretation that holding a high level of organization is a key variable in distinguishing healthy perfectionists from their unhealthy counterparts. In addition, a prime factor in developing the FMPS was the incorporation of the full range of dimensions most commonly cited in the literature when referring to perfectionism. Because emphasis on order and orderliness has often been associated with perfectionism, retention of the O dimension acknowledges both the positive and negative qualities of perfectionism (Lynd-Stevenson & Hearne, 1999).

Healthy and Unhealthy Dichotomy of the Perfectionism Construct

Our nested CFA assessed whether there was support for extant theories about the duality of the perfectionism construct in being either a positive force in the drive for

achievement or a debilitating precursor to fear of failure and underachievement. Stumpf and Parker (2000) recently argued for a dichotomy between healthy and unhealthy higher order perfectionism factors, with PS and O constituting the healthy and PEC and CMD the unhealthy higher order factors. Our findings do *not* support such a dichotomy, due mainly to low measures of internal consistency for the proposed higher order constructs and low within-construct relative to across-construct correlations. When substantial reliable variance in first-order factor scores cannot be explained by higher order factors, the practicality of the parsimony they offer is outweighed by more substantive considerations. Higher order factors in such cases do not provide valid descriptions of information provided in the first-order factors. Within-construct correlations in Stumpf and Parker's study were not particularly strong either (.28 for healthy and .42 for unhealthy perfectionism), although there were no strong across-construct correlations in their study. It will be important for further studies in diverse student samples to continue to explore the validity of a healthy versus unhealthy dichotomy for the multiple dimensions of perfectionism measured by the FMPS.

Perfectionist Typology

Our results confirmed our expectation that high personal standards would be common to students in both the healthy (P+) and unhealthy (P–) perfectionist groups, both of which were higher than the nonperfectionist (Pn) group. The P– group was characterized by the highest scores on negative evaluative concerns (as represented in the PEC and CMD subscales) and the P+ group by the higher scores on O. Our data indicated that the differences between healthy and unhealthy perfectionists were attributable to differing patterns of scores across four dimensions of the FMPS measurement of perfectionism. The analysis of empirically formed clusters on the dimensions from which clusters were derived is not entirely satisfactory, because this introduces a structural dependency between the independent and dependent variables. However, we have obtained supplemental evidence from a further study in the next academic year with a subset of the original participants (85 of the total 409, then in Years 8 and 11 in one of the participating schools), that perfectionist cluster membership also statistically significantly discriminated scores on a range of independent correlates that included depression, learning goals, self-efficacy, and self-handicapping (see Hawkins, Watt, & Sinclair, 2001). Those findings strengthen confidence in our identified perfectionist typology and serve to provide evidence toward cross-validation.

Perfectionist typologies have also been identified in a number of studies across a range of samples. Parker (1997) found empirical support for two clusters of perfectionists and one nonperfectionist cluster in a study of academically talented sixth graders at Johns Hopkins University. Similar results were found in three North American studies using college samples (Rice & Dellwo, 2002; Rice & Lapsley, 2001; Rice & Mirzadeh, 2000), in a study of mathematically gifted and typical Czech students (Parker et al., 2001), in a study of Australian secondary school adolescents (Hawkins et al., 2000), and in Kornblum's (2001) study of Australian gifted school students.

Taken collectively, the findings of these studies support the existence of a typology of healthy perfectionist, unhealthy perfectionist, and nonperfectionist students across diverse samples (Cox, Enns, & Clara, 2002), although the actual structure of the perfectionist clusters is somewhat varied. The slight differences may have occurred as a result of the number of dimensions of perfectionism being analyzed in the clustering procedure. The Parker and Rice groups incorporated the six original subscales of the FMPS, whereas Hawkins et al. (2000), Kornblum (2001), and the present study examined four reformulated dimensions of the measure of perfectionism in line with Stöber's (1998) four-factor solution. The second variation to the cluster structure across the cluster analytic studies supported our empirical finding that holding high personal standards was common to both healthy and unhealthy perfectionists (e.g., Kornblum, 2001; Rice & Lapsley, 2001). An additional empirical confirmation of our interpretation that healthy perfectionists are further characterized by their highest scores on the O subscale was evidenced in the results of all of the cluster analytic studies of the FMPS that we reviewed (Hawkins et al., 2000; Kornblum, 2001; Parker, 1997; Parker et al., 2001; Rice & Dellwo, 2002; Rice & Lapsley, 2001; Rice & Mirzadeh, 2000; Slaney et al., 2002).

Future Directions and Recommendations

This study was conducted with female students only, which poses a limitation to the generalizability of our findings. Although no statistically significant gender differences have been reported in most previous studies using the FMPS (Ablard & Parker, 1997; Adkins & Parker, 1996; Parker & Adkins, 1995; Rice & Lapsley, 2001; Rice & Mirzadeh, 2000; Slaney et al., 2002), with statistically significant, albeit small, effect sizes for gender differences reported by Parker et al. (2001), it is important that future research extend our findings using a sample that includes male and female Australian secondary students. Our findings support the use of the reformulated FMPS with four factors—PS, O, PEC, and CDM—in our sample of Australian secondary school girls, which may be used to identify healthy perfectionist, unhealthy perfectionist, and nonperfectionist student types. It would be interesting for future research to consider the possibility that this underlying perfectionist typology might relate to other variables such as culture or life stage, through designs based on longitudinal data and cross-cultural samples. Our findings do not support a simple dichotomy between healthy and unhealthy perfectionism factors defined in terms of PS/O and CMD/PEC, respectively. Additional research is needed to further explore the validity of those higher order factors proposed by Stumpf and Parker (2000).

We concur with Stumpf and Parker (2000) that a fruitful direction for future research would be to focus on correlates for each of the multiple dimensions of perfectionism. Given the multidimensionality of the perfectionism construct, it would not appear to be useful or informative to base investigations of correlates, antecedents, or consequences on a single global perfectionism score. Equally, we believe investigations using higher order summary healthy and unhealthy perfectionism scores should proceed with caution, given our findings and those of Stumpf and Parker that demon-

strate different correlates for first-order component factors of their proposed higher order constructs. In the context of schooling, which is of particular interest to us, studies that focus on the cognitive and motivational consequences for healthy perfectionists, unhealthy perfectionists, and nonperfectionists will be particularly important to those who are engaged in the teaching and learning process.

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