global perspectives

A Person-Centered Perspective on Multidimensional Perfectionism in Canadian and Chinese University Students: A Multigroup Latent Profile Analysis

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This study investigated the generalizability of the tripartite model of perfectionism across Canadian and Chinese university students. Using latent profile analysis and indicators of perfectionistic strivings, perfectionistic concerns, and neuroticism in both groups, the authors derived a 3-profile solution: adaptive perfectionists, maladaptive perfectionists, and nonperfectionists. Furthermore, multigroup latent profile analysis supported the construct equivalence of the 3-profile solution across groups. Results further suggested that a greater proportion of Chinese students could be classified as adaptive perfectionists.

Keywords: perfectionism, cross-cultural, multigroup mixture modeling

Este estudio investigó la generalizabilidad del modelo tripartito de perfeccionismo entre estudiantes universitarios canadienses y chinos. Usando un análisis de perfil latente e indicadores de esfuerzos perfeccionistas, preocupaciones perfeccionistas y neuroticismo en ambos grupos, los autores desarrollaron una solución de 3 perfiles: perfeccionistas adaptados, perfeccionistas inadaptados y no perfeccionistas. Además, el análisis de perfil latente multigrupo confirmó la equivalencia de constructo de la solución de 3 perfiles en estos grupos. Los resultados sugieren también que una mayor proporción de estudiantes chinos podría clasificarse como perfeccionistas adaptados.

Palabras clave: perfeccionismo, intercultural, modelización de mezcla multigrupo

Perfectionism is a dispositional tendency to strive for flawlessness, set excessively high standards, and experience disappointment with anything falling short of perfection (Frost, Marten, Lahart, & Rosenblate, 1990; Hewitt & Flett, 1991). A widely used model proposes that perfectionism is best conceptualized as a multidimensional personality trait (see Hewitt, Flett, Besser, Sherry, & McGee, 2003) composed of two higher order factors (Dunkley, Zuroff, & Blankstein, 2003; Stoeber & Otto, 2006): perfectionistic strivings and perfectionistic concerns. *Perfectionistic strivings* refers to the

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propensity to tirelessly strive for self-perfection and set excessively high personal standards (Stoeber & Otto, 2006), whereas *perfectionistic concerns* refers to the propensity to have overly negative reactions to perceived setbacks, excessive concerns over others' criticisms, and nagging self-doubts (Smith, Saklofske, & Nordstokke, 2014).

Previous person-centered research has suggested that the interaction between perfectionistic strivings and concerns differentiates three within-person combinations of perfectionism: adaptive perfectionists, maladaptive perfectionists, and nonperfectionists (Stoeber & Otto, 2006). Adaptive perfectionists and maladaptive perfectionists have higher perfectionistic strivings than do nonperfectionists (Rice, Lopez, & Richardson, 2013; Richardson, Rice, & Devine, 2014). Maladaptive perfectionists, compared with adaptive perfectionists, have higher perfectionistic concerns (Stoeber & Otto, 2006) and, relative to adaptive perfectionists or nonperfectionists, have greater depression, anxiety, and stress, and lower life satisfaction (Stoeber & Otto, 2006).

Although the three-profile model of within-person combinations of perfectionism is a valuable contribution, research findings stem primarily from North American respondents completing measures designed by Western researchers (e.g., Richardson et al., 2014). Moreover, the few available studies investigating similarities and differences in perfectionism across cultures (e.g., Stoeber & Yang, 2010) tend to rely on variable-centered analyses (e.g., multiple regression and/or structural equation modeling) in contrast to person-centered analyses (e.g., latent profile analysis [LPA]). These variable-centered, cross-cultural studies have yielded important findings, but do not take into account the possibility that individuals may come from different within-group subpopulations in which the relation between perfectionistic strivings and perfectionistic concerns differs quantitatively and qualitatively (Eid, Langeheine, & Diener, 2003).

Until a person-centered investigation of perfectionism is conducted across cultures and in countries other than Canada and the United States, it remains unclear whether (a) a three-profile solution is the best solution across groups, (b) the three expected profiles are structurally equivalent in other cultural groups (i.e., construct equivalence), and (c) profile size proportions (i.e., the proportion of individuals classified as maladaptive perfectionists, adaptive perfectionists, or nonperfectionists) vary between groups. In the current study, if a three-profile solution was supported in both Canadian and Chinese groups, and if profiles were found to be structurally equivalent, it would add support to the generalizability of this model of perfectionism. However, if evidence did not support this solution for both groups or if construct equivalence was not demonstrated, it would contest the applicability of the previously identified adaptive perfectionist, maladaptive perfectionist, and nonperfectionist profiles to Chinese individuals. It would also preclude the comparison of profile size proportions across groups.

the present study

We hypothesized that a three-profile solution could be derived with three observed indicators measuring perfectionistic strivings, perfectionistic concerns, and neuroticism (Rice et al., 2013; Richardson et al., 2014) in Canadian and Chinese university students. Neuroticism was included as an indicator based on research suggesting that neuroticism underlies and predisposes perfectionism (Dunkley, Blankstein, & Berg, 2012; Rice et al., 2013; Sherry & Hall, 2009; Smith et al., 2014). In addition, we hypothesized that the tripartite model would provide the most meaningful description of perfectionism for both the Canadian and Chinese groups and would correspond to profiles identified in previous research of adaptive perfectionists, maladaptive perfectionists, and nonperfectionists (Rice et al., 2013; Richardson et al., 2014). These profiles were expected to be structurally equivalent across groups.

Anticipating a three-profile solution and support for construct equivalence, we further expected that the construct validity of the profiles would be supported via theoretically coherent patterns of associations with depression, anxiety, stress, negative affect, positive affect, and life satisfaction. That is, we expected that if a three-profile solution with construct equivalence was extracted, maladaptive perfectionists would report higher depression, anxiety, stress, and negative affect, and lower positive affect and life satisfaction relative to adaptive perfectionists and, in turn, relative to the group with the lowest perfectionistic strivings, perfectionistic concerns, and neuroticism (i.e., nonperfectionists). Finally, previous research has suggested that, relative to Chinese university students, Canadian university students report equivalent perfectionistic concerns but significantly greater perfectionistic strivings (see Smith, Saklofske, Yan, & Sherry, 2015) and, furthermore, that regardless of language (English or Mandarin) or country (Canada or China), perfectionistic strivings exacerbate the effect of perfectionistic concerns on depression, anxiety, and stress (see Smith, Saklofske, Yan, & Sherry, 2015). Thus, we hypothesized that a greater proportion of Canadian students would be categorized as maladaptive perfectionists compared with Chinese students and that, conversely, the proportion of individuals categorized as adaptive perfectionists would be greater in the Chinese group relative to the Canadian group.

method

The data used in the present study were drawn from a larger cross-cultural research project (see Smith, Saklofske, Yan, & Sherry, 2015, 2016).

PARTICIPANTS

Canadian participants (n = 425; 109 men and 316 women; age: M = 18.8 years, SD = 4.0) were recruited from a large university in central Canada. Chinese participants (n = 550; 169 men, 370 women, and 11 who did not

report their sex; age: M = 20.5 years, SD = 1.4) were attending a large university in Beijing, China.

MEASURES

Measures used in the Chinese sample were translated into Mandarin by Chinese psychologists fluent in both English and Mandarin following the procedures outlined by Hambleton and Lee (2013), which included translating and back-translating scales to ensure content equivalence.

Perfectionistic strivings. Perfectionistic strivings were measured by standardizing and summing items from three subscales: the short form of Hewitt and Flett's (1991) Multidimensional Perfectionism Scale Self-Oriented Perfectionism subscale (HFMPS-SOP; e.g., "I strive to be as perfect as I can be"; see Hewitt, Habke, Lee-Baggley, Sherry, & Flett, 2008); the Personal Standards subscale of Frost et al.'s (1990) Multidimensional Perfectionism Scale (FMPS-PS; e.g., "I expect higher performance in my daily tasks than most people"); and the modified form of Garner, Olmstead, and Polivy's (1983) Eating Disorder Inventory Self-Oriented Perfectionism subscale (EDI-SOP; e.g., "I feel that I must do things perfectly, or not do them at all"; see Sherry & Hall, 2009). The HFMPS-SOP, FMPS-PS, and EDI-SOP were selected based on research suggesting that they measure core behavioral, interpersonal, and cognitive features of perfectionistic strivings (Mackinnon & Sherry, 2012; McGrath et al., 2012; Smith, Saklofske, & Yan, 2015; Smith, Saklofske, Yan, & Sherry, 2015; Smith et al., 2016). Cronbach's alpha for the five-item HFMPS-SOP typically ranges between .75 and .85 (see Hewitt et al., 2008). Garner et al. (1983) found a Cronbach's alpha of .82 for the EDI-SOP. Finally, Frost et al. (1990) reported a Cronbach's alpha of .77 for the FMPS-PS. Participants responded to the HFMPS-SOP using a 7-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The FMPS-PS uses a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), and the EDI-SOP uses a 6-point Likert-type scale ranging from 1 (*never*) to 6 (*always*).

Perfectionistic concerns. Perfectionistic concerns were measured by standardizing and summing items from three subscales: the short form of Hewitt and Flett's (1991) Multidimensional Perfectionism Scale Socially Prescribed Perfectionism subscale (HFMPS-SPP; e.g., "My family expects me to be perfect"; Hewitt et al., 2008), the five-item short form of Frost et al.'s (1990) Multidimensional Perfectionism Scale Concern Over Mistakes subscale (FMPS-COM; e.g., "If I fail partly, it is as bad as being a complete failure"; Cox, Enns, & Clara, 2002), and Frost et al.'s (1990) Multidimensional Perfectionism Scale Doubts About Actions subscale (FMPS-DAA; e.g., "I usually have doubts about the simple everyday things I do"). Again, we selected the HFMPS-SPP, FMPS-COM, and FMPS-DAA on the basis of research indicating that they measure the core features of perfectionistic concerns (Graham et al., 2010; Smith et al., 2014; Smith, Saklofske, & Yan, 2015). Research has supported the reliability (α = .88) and validity of our measure of perfectionistic concerns (Smith et

al., 2014; Smith, Saklofske, & Yan, 2015). Sherry, Hewitt, Sherry, Flett, and Graham (2010) found a Cronbach's alpha of .76 for the five-item HFMPS-SPP. Mackinnon and Sherry (2012) reported a Cronbach's alpha of .87 to .89 for the five-item FMPS-COM. Finally, Rice and Dellwo (2001) reported a Cronbach's alpha of .78 for the FMPS-DAA. Participants responded to the HFMPS-SPP using a 7-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) and responded to the FMPS-COM and FMPS-DAA using a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

Neuroticism. Neuroticism was assessed with the eight-item Neuroticism subscale of the Big Five Inventory (BFI-N; e.g., "I see myself as someone who can be moody"; Benet-Martinez & John, 1998). Participants responded to items on the BFI-N using a 5-point Likert scale ranging from 1 (*disagree strongly*) to 5 (*agree strongly*). Research has supported the reliability and validity of the BFI-N (Benet-Martinez & John, 1998). Sherry, Mackinnon, Fitzpatrick, and Macneil (2013) reported adequate alpha reliability for the BFI-N (α = .81). The BFI-N correlates strongly with the Neuroticism subscale of Costa and McCrae's (1992) NEO Five-Factor Inventory (r = .76; Benet-Martinez & John, 1998).

Depression, anxiety, and stress. Depression, anxiety, and stress were measured using the 21-item short form of the Depression Anxiety Stress Scales (DASS-21; Lovibond & Lovibond, 1995). The DASS-21 is composed of three 7-item subscales assessing depression (e.g., "I felt that life was meaningless"), anxiety (e.g., "I felt scared without any good reason"), and stress (e.g., "I found it hard to wind down"). Participants responded to items using a 4-point Likert-type scale ranging from 0 (*did not apply to me at all*) to 3 (*applied to me very much, or most of the time*). Research has supported the reliability and validity of the DASS-21 (Lovibond & Lovibond, 1995; Osman et al., 2012). Good reliabilities have been found for the Depression subscale (α = .85; 95% confidence interval [CI] [0.83, 0.87]), the Anxiety subscale (α = .81; 95% CI [0.79, 0.84]), and the Stress subscale (α = .88; 95% CI [0.87, 0.89]; Osman et al., 2012).

Positive and negative affect. Positive and negative affect were measured using the 20-item Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). The PANAS is composed of a 10-item subscale measuring positive affect (e.g., "proud") and a 10-item subscale measuring negative affect (e.g., "nervous"). Items are rated on a 5-point Likert-type scale ranging from 1 (*very slightly or not at all*) to 5 (*extremely*). Research has supported the validity and reliability of the PANAS (Crawford & Henry, 2004; Watson et al., 1988). Crawford and Henry (2004) found good reliabilities for the Positive Affect subscale (α = .89) and the Negative Affect subscale (α = .85).

Satisfaction with life. Satisfaction with life was measured using the five-item Satisfaction With Life Scale (SWLS; e.g., "I am satisfied with my life"; Diener, Emmons, Larsen, & Griffin, 1985). Participants used a 7-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) to indicate their level of agreement to the statements. Research has supported the reliability and

validity of the SWLS (Pavot & Diener, 2008). Good alpha reliability has been found for the SWLS (α = .79–.89; Pavot & Diener, 2008).

PROCEDURE

The research ethics board at the Canadian university approved the current study. We recruited Canadian participants from the Department of Psychology's participant pool and directed them to an online consent form and questionnaires. We recruited Chinese participants according to the Chinese university's established research protocol. After the measures were completed, we debriefed the Canadian and Chinese participants.

DATA ANALYTIC STRATEGY

LPA and multigroup LPA (MLPA) were conducted using Mplus (Version 6; Muthén & Muthén, 1998–2011) to examine the profiles of perfectionists and nonperfectionists. We chose LPA over cluster analysis in consideration of evidence suggesting that the stopping rules used by cluster analysis to determine the optimal numbers of classes are fallible (Richardson et al., 2014; Ruscio & Ruscio, 2004). For all LPA and MLPA models, we used robust maximum likelihood. We used the pattern-missing option for missing data. We satisfied the assumption of conditional independence by fixing the residual correlations between indicators to zero (Nylund, Asparouhov, & Muthén, 2007). To guard against solutions representing local maxima, we used 5,000 random sets of starting values, after 100 iterations with 500 optimizations (Rice et al., 2013).

The profile solution for the entire sample was determined by conducting an LPA for the Canadian and Chinese groups separately (Geiser, Lehmann, & Eid, 2006). For each group, we fitted models with different numbers of profiles (i.e., one- to five-profile solutions). For model selection purposes, we evaluated the fit of different LPA solutions according to the Bayesian information criterion (BIC), entropy, the Lo–Mendell–Rubin likelihood ratio test (LMLRT test), interpretability, and practicality (e.g., a sufficient number of members in each profile; see Collins & Lanza, 2010). Smaller BIC values indicate better model fit (Nylund et al., 2007). Entropy measures the extent to which distinct classes have been identified; although there is yet no consensus on cutoff values for entropy, values range from 0 to 1, with higher values indicating better fitting models with more certainty of correct classification. It is important to note that entropy alone is not sufficient to determine the model with the optimal number of classes (Henson, Reise, & Kim, 2007). Finally, the LMLRT test evaluates if a model with k profiles fits the data better than a model with $k - 1$ profiles. If the p value for the LMLRT test is significant, it suggests that the k profile model should be rejected and the $k - 1$ profile model preferred.

After selecting the latent profile model for the entire sample, we tested construct equivalence across the Canadian and Chinese groups, including

unconstrained, semiconstrained, and fully constrained MLPAs, with country as the grouping variable (Eid et al., 2003; Geiser et al., 2006). For the unconstrained model, within-profile means and variances were allowed to vary freely over group, in addition to profile size. For the semiconstrained model, profile size was still allowed to vary freely, but conditional means and variances were constrained to be equal across groups. Finally, for the fully constrained model, both profile size and within-profile means and variances were fixed to be equivalent across groups.

In comparing the fit of the semiconstrained model with the unconstrained model, one can determine if the profile structure is equivalent across groups (Eid et al., 2003). If the semiconstrained model fits as well as or better than the unconstrained model, it suggests that the assumption of construct equivalence should not be rejected. Furthermore, if the fully constrained model fits worse than the semiconstrained model, it indicates that significant differences in profile size proportions are present between groups. Following previous literature, we compared the unconstrained, semiconstrained, and fully constrained models according to their BIC values, and we chose the model with the lowest BIC value (Geiser et al., 2006; Nylund et al., 2007). We evaluated the criterion validity of the latent profile solution using the auxiliary option in Mplus to test the equality of within-class means on measures of depression, anxiety, stress, negative affect, positive affect, and satisfaction with life using posterior probability–based multiple imputation (Rice et al., 2013). The auxiliary option in Mplus maintains the probability of profile membership; thus, latent profile composition was not affected by exploring means (Rice et al., 2013). Mean differences between latent profiles were evaluated using Wald statistics (Richardson et al., 2014).

results

DESCRIPTIVE STATISTICS

Means, standard deviations, alpha reliabilities, and bivariate correlations are shown in Table 1. All alpha reliabilities were acceptable ($\alpha \geq .75$). In both the Canadian and Chinese groups, bivariate correlations indicated that perfectionistic strivings had a strong positive association with perfectionistic concerns, and weak positive associations with neuroticism, depression, anxiety, stress, and negative affect. Furthermore, in both groups, perfectionistic concerns had moderate and positive relations with neuroticism, depression, anxiety, stress, and negative affect, and weak to moderate negative correlations with satisfaction with life and positive affect. In the Canadian group, perfectionistic strivings were not significantly correlated with either life satisfaction or positive affect, whereas, in the Chinese group, perfectionistic strivings had a weak positive association with positive affect. Canadian and Chinese participants reported equivalent levels of perfectionistic concerns, $t(957) = -0.25$, $p = .805$, $d = -.02$,

TABLE 1

Means, Standard Deviations, Alpha Reliabilities, and Bivariate Correlations

Variable	1	2	3	4	5	6	7	8	9	α	M	SD
1. PS	—	.50**	.19**	.12**	.26**	.32**	.24**	.19**	−.04	.85	44.70	9.30
2. PC	.63**	—	.41**	.40**	.42**	.42**	.41**	−.14**	−.30**	.80	44.70	8.50
3. NEU	.19**	.48**	—	.52**	.58**	.61**	.64**	−.39**	−.39**	.75	23.00	4.70
4. DEP	.27**	.50**	.58**	—	.67**	.70**	.68**	−.42**	−.41**	.75	3.40	3.10
5. Anxiety	.26**	.47**	.48**	.70**	—	.75**	.71**	−.23**	−.36**	.77	3.40	3.30
6. Stress	.28**	.49**	.59**	.75**	.71**	—	.70**	−.27**	−.37**	.78	5.30	4.00
7. NA	.20**	.48**	.64**	.64**	.58**	.62**	—	−.24**	−.39**	.89	19.00	6.90
8. PA	.05	−.28**	−.47**	−.44**	−.28**	−.33**	−.32**	—	.35**	.89	29.70	7.30
9. SWL	−.11	−.34**	−.53**	−.58**	−.43**	−.43**	−.47**	.50**	—	.82	20.40	5.70
Reliability (α)	.91	.89	.87	.88	.81	.82	.90	.90	.88			
M	49.40	44.50	23.60	4.60	4.40	6.00	22.60	34.90	24.20			
SD	12.90	13.00	7.10	4.30	3.80	3.90	9.00	7.40	6.60			

Note. Statistics for Chinese participants (*n* = 550) are presented above the diagonal, and statistics for Canadian participants (*n* = 425) are presented below the diagonal. PS = perfectionistic strivings; PC = perfectionistic concerns; NEU = neuroticism; DEP = depression; NA = negative affect; PA = positive affect; SWL = satisfaction with life.
**p < .01.

and neuroticism, $t(953) = 1.60$, $p = .109$, $d = −.10$; however, Canadian participants reported significantly higher perfectionistic strivings, $t(956) = 6.48$, $p < .001$, $d = .42$.

SINGLE-GROUP LPA

All models converged on a replicated solution. Model comparison statistics are presented in Table 2. In the Canadian group, BIC values declined with each successive model, until the three-profile solution, at which point, BIC values appeared to level off; the lowest BIC value was for the three-profile solution. The entropy value for the three-profile solution was .71. Although the entropy value for the five-profile solution was higher than the entropy value for the three-profile solution, the five-profile solution generated one profile in which only 2.0% of the sample was likely to be classified in that group. The LMLRT also supported a two-profile solution over a single-profile solution, and revealed an improvement when the three-profile solution was compared with the two-profile solution.

For the Chinese group, BIC values declined with each successive model, until the four profile-solution, at which point, BIC values appeared to level off; the lowest BIC value was for the four-profile solution. However, the four-profile solution generated one profile in which only 3% of the sample was likely to be classified in that group and thus was not considered a viable model. In addition, the five-profile solution generated one profile in which only 0.4% of the population was likely to be classified in that group and therefore was also not considered a viable model. The entropy value for the three-profile solution was .67. The LMLRT

TABLE 2

Fit Indices for One- to Five-Profile Models

Model and Profile	Count	Proportion	Entropy	BIC	LMLRT	p
Canadian group						
One-profile				9,508.55		
Two-profile			.72	9,292.13	231.15	<.001
1	265	.63				
2	157	.37				
Three-profile			.71	**9,252.80**	60.99	.002
1	178	.42				
2	150	.36				
3	94	.22				
Four-profile			.79	9,254.03	22.04	.003
1	164	.39				
2	142	.34				
3	106	.25				
4	10	.02				
Five-profile			.79	9,259.31	18.15	.098
1	145	.34				
2	135	.32				
3	95	.23				
4	35	.08				
5	12	.03				
Chinese group						
One-profile				11,008.53		
Two-profile			.54	10,878.56	149.29	<.001
1	290	.53				
2	259	.47				
Three-profile			.67	10,849.47	52.23	.580
1	395	.72				
2	106	.19				
3	48	.09				
Four-profile			.74	**10,827.70**	45.21	.048
1	265	.48				
2	225	.41				
3	40	.07				
4	19	.03				
Five-profile			.77	10,829.82	22.23	.016
1	261	.48				
2	229	.42				
3	38	.07				
4	19	.03				
5	2	.00				

Note. Proportions may not total 1.00 because of rounding. The lowest Bayesian information criterion (BIC) value obtained in each group is in boldface. LMLRT = Lo–Mendell–Rubin likelihood ratio test.

supported a two-profile model over a single-profile model, but did not reveal an improvement when the three-profile model was compared with the two-profile model. However, given the two-profile solution's low entropy (.54), and the three-profile solution's higher entropy and lower BIC value, the three-profile solution was preferred over the two-profile solution. Thus, in terms of fit indicators, interpretability, and practicality, results suggested that a three-profile solution was the best solution for both the Canadian and Chinese groups (see Table 2).

MLPA

We conducted an MLPA to test if the three-profile solution chosen for the entire sample showed the same latent profile structure and profile size proportions across the Canadian and Chinese groups (Eid et al., 2003; Geiser et al., 2006). The BIC value was 21,524.20 for the unconstrained model; 21,494.28 for the semiconstrained model; and 21,638.71 for the fully constrained model. Thus, the best model was a three-profile semiconstrained solution. However, given the increase in the BIC value when profile size proportions were assumed to be equal, results suggested that nontrivial differences in profile size proportions were present between groups. As Table 3 shows, group differences in profile sizes appear for Profile 1 (Canada = 43.30%; China = 20.50%), Profile 2 (Canada = 16.40%; China = 70.30%), and Profile 3 (Canada = 41.30%, China = 9.20%). These differences explain the observed increase in the BIC value when the semiconstrained model was compared with the fully constrained model, because the fully constrained model assumes equivalent profile size proportions across groups.

The three-profile semiconstrained solution provided useful latent profile separation, with adequate classification reliability (entropy = .81). Compared with Profile 1, Profile 2 had greater perfectionistic strivings, $W(1) = 20.89$, $p < .001$, $d = .30$; perfectionistic concerns, $W(1) = 321.41$, $p < .001$, $d = 1.40$; and neuroticism, $W(1) = 48.57$, $p < .001$, $d = .46$. However, relative to Profile 3, Profile 2 had lower perfectionistic strivings, $W(1) = 203.65$, $p < .001$, $d = 1.03$; perfectionistic concerns, $W(1) = 67.59$, $p < .001$, $d = .55$; and neuroticism, $W(1) = 24.98$, $p < .001$, $d = .32$. Finally, compared with Profile 1, Profile 3 had greater perfectionistic strivings, $W(1) = 184.89$, $p < .001$, $d = .98$; perfectionistic concerns, $W(1) = 283.74$, $p < .001$, $d = 1.28$; and neuroticism, $W(1) = 85.93$, $p < .001$, $d = .62$. The patterns of within-profile means observed in the Canadian and Chinese groups were theoretically consistent with the tentative labels of nonperfectionists for Profile 1, adaptive perfectionists for Profile 2, and maladaptive perfectionists for Profile 3 (see Rice et al., 2013; Richardson et al., 2014).

TABLE 3

Estimated Indicator Means for the Three-Profile Semiconstrained Model

| Profile | % Group | | *M* PS | *M* PC | *M* Neur |
	Canadian	Chinese			
Nonperfectionist	43.30	20.50	39.75	33.74	19.85
Adaptive perfectionist	16.40	70.30	44.96	46.03	23.62
Maladaptive perfectionist	41.30	9.20	59.48	55.69	26.97

Note. Percentages may not total 100 because of rounding. PS = perfectionistic strivings; PC = perfectionistic concerns; neur = neuroticism.

CRITERION VALIDITY

Descriptive statistics and within-profile mean comparisons on inactive covariates for the three-profile semiconstrained solution are presented in Table 4. As hypothesized, the profile tentatively labeled adaptive perfectionists compared with the profile tentatively labeled maladaptive perfectionists reported lower depression, anxiety, stress, and negative affect. However, there was no observed difference between adaptive perfectionists and maladaptive perfectionists on positive affect or satisfaction with life. Relative to nonperfectionists, adaptive perfectionists reported higher depression, anxiety, stress, and negative affect, and lower positive affect and satisfaction with life. Compared with nonperfectionists, maladaptive perfectionists reported higher depression, anxiety, stress, and negative affect, and lower positive affect and satisfaction with life.

discussion

Perfectionism is a commonly seen problem among university students at counseling centers (Johnson & Hayes, 2003). Furthermore, most large universities have an increasing number of international students; thus, it is important to evaluate the extent to which models, such as the tripartite of model of perfectionism, generalize to other cultural contexts. The present findings support the generalizability of within-person combinations of perfectionistic strivings, perfectionistic concerns, and neuroticism across a large sample of Canadian and Chinese university students. As expected, in both the Canadian and Chinese groups, the LPAs did not support a single-profile solution, thereby adding to accumulating evidence suggesting that perfectionism is a personality trait best understood as multidimensional (e.g., Hewitt et al., 2003) as opposed to unidimensional (e.g., Shafran, Cooper, & Fairburn, 2002). Furthermore, as

TABLE 4

Means, Standard Errors, and Comparisons for Inactive Covariates Across the Three-Profile Semiconstrained Model

Profile	Depression		Anxiety		Stress		NA		PA		SWL	
	M	SE	M	SE	M	SE	M	SE	M	SE	M	SE
NP	2.22	.16	2.38	.15	3.66	.19	17.05	.39	34.03	.50	24.58	.39
AP	3.67	.17	3.98	.17	5.64	.17	20.46	.38	30.55	.41	21.06	.32
MP	6.15	.35	6.13	.31	8.24	.32	25.56	.64	31.86	.59	20.61	.51
NP vs. AP	$\chi^2 = 36.15^{***}$		$\chi^2 = 47.22^{***}$		$\chi^2 = 46.85^{***}$		$\chi^2 = 34.69^{***}$		$\chi^2 = 25.20^{***}$		$\chi^2 = 45.20^{***}$	
NP vs. MP	$\chi^2 = 101.06^{***}$		$\chi^2 = 113.08^{***}$		$\chi^2 = 142.75^{***}$		$\chi^2 = 127.24^{***}$		$\chi^2 = 7.98^{***}$		$\chi^2 = 38.47^{***}$	
AP vs. MP	$\chi^2 = 36.94^{***}$		$\chi^2 = 34.00^{***}$		$\chi^2 = 43.41^{***}$		$\chi^2 = 42.76^{***}$		$\chi^2 = 2.91^*$		$\chi^2 = 0.99^*$	

Note. Mean differences between latent profiles computed using the Wald statistic. NA = negative affect; PA = positive affect; SWL = satisfaction with life; NP = nonperfectionist; AP = adaptive perfectionist; MP = maladaptive perfectionist.
*$p < .05$. ***$p < .001$.

anticipated, the LPAs conducted with the Canadian and Chinese groups both indicated that a three-profile solution was the preferred solution. This finding complements previous research (Rice et al., 2013; Richardson et al., 2014).

Although the distribution of profiles varied across groups, the relationship between the latent categorical variable (i.e., profiles) and the manifest variables (i.e., perfectionistic strivings, perfectionistic concerns, and neuroticism) was equivalent across the Canadian and Chinese groups. Thus, the profiles labeled as nonperfectionist (Profile 1), adaptive perfectionist (Profile 2), and maladaptive perfectionist (Profile 3) in the Canadian group did not differ in structure from the profiles of the similar Chinese group. This finding suggests that the three-profile model of perfectionism found in North American individuals (e.g., Rice et al., 2013; Richardson et al., 2014) is generalizable to and relevant for Chinese individuals. Furthermore, as we hypothesized, the validity of the three-profile semiconstrained solution was supported via theoretically coherent patterns of associations with measures of depression, anxiety, stress, negative affect, positive affect, and satisfaction with life. In line with previous research (Rice et al., 2013; Richardson et al., 2014), maladaptive perfectionists reported greater depression, anxiety, stress, and negative affect relative to adaptive perfectionists or nonperfectionists. However, unexpectedly, adaptive perfectionists and maladaptive perfectionists did not differ in either life satisfaction or positive affect. This finding may stem from both adaptive perfectionists' and maladaptive perfectionists' inability to derive satisfaction from performance (Stoeber & Yang, 2010).

In addition, although construct equivalence of the three-profile solution was established, our results indicate group differences in profile size proportions. In the Canadian group, 41.3% were categorized as maladaptive perfectionists, compared with only 9.2% in the Chinese group. Furthermore, 70.3% of the Chinese group were classified as adaptive perfectionists, compared with only 16.4% of the Canadian group. These findings suggest that although perfectionism appears to be more prevalent among Chinese university students, maladaptive perfectionism may be more common among Canadian university students. It is important to note that at the mean level, the Canadian group, relative to the Chinese group, did not report significantly different levels of perfectionistic concerns or neuroticism. However, the Canadian group did report higher perfectionistic strivings. On the basis of research suggesting that for both Canadian and Chinese university students, perfectionistic strivings interact with perfectionistic concerns, such that perfectionistic strivings exacerbate the link between perfectionistic concerns and negative psychological outcomes (see Smith, Saklofske, Yan, & Sherry, 2015), it seems plausible that the greater prevalence of Canadian university students categorized as maladaptive perfectionists stems from their tendency to more readily and rigidly strive for perfection of the self, which subsequently amplified the association between perfectionistic concerns and maladaptive psychological outcomes (see Smith, Saklofske, Yan, & Sherry, 2015).

Our results also suggest that perfectionists, regardless of whether they were classified as adaptive perfectionists or maladaptive perfectionists, tended to report higher levels of depression, anxiety, stress, and negative affect than did nonperfectionists. In the current study, we found no support for the debated contention of a healthy within-person combination of perfectionism characterized by high perfectionistic strivings, low perfectionistic concerns, and low neuroticism (Rice et al., 2013; Richardson et al., 2014). This profile may not have been extracted in the present research because of our operationalization and measurement of perfectionistic strivings and perfectionistic concerns differing from those of Rice et al. (2013) and Richardson et al. (2014). They operationalized perfectionistic strivings and perfectionistic concerns using the Almost Perfect Scale–Revised (APS-R; Slaney, Rice, Mobley, Trippi, & Ashby, 2001), whereas we operationalized perfectionistic strivings and perfectionistic concerns using subscales from the FMPS, HFMPS, and EDI (Mackinnon & Sherry, 2012). It is important to note that the APS-R has overt unique features and item content that distinguishes it from the FMPS, HFMPS, and EDI subscales used in the present study. For example, in contrast to the subscales used in the present study, the word *perfect* is absent from the item content of the APS-R (Flett & Hewitt, 2015). In addition, according to Flett and Hewitt (2015), the High Standards subscale of the APS-R is more akin to a measure of striving for excellence than a measure of perfectionism. Moreover, relative to the FMPS-PS and the HFMPS-SOP, Slaney et al. (2001) reported that the High Standards subscale of the APS-R had a substantially greater association with self-esteem and a substantially smaller association with concern over mistakes.

IMPLICATIONS FOR COUNSELORS

The present research gives rise to an important question: Does a healthy within-person combination of perfectionism exist, and, if so, why was the adaptive perfectionist profile in the present study associated with greater depression, anxiety, stress, and negative affect across two groups of students living in different countries? We encourage counselors to tackle this salient question and to consider the possibility that past support for labeling individuals as adaptive perfectionist may stem from the APS-R's overlap with conscientiousness and striving for excellence. We also advise counselors to cease labeling students as adaptive perfectionists, maladaptive perfectionists, and nonperfectionists, because this practice encourages stigmatization. In its place, we recommend that counselors adopt a personalized assessment approach that tailors treatment based on the strengths and weaknesses of the client. Additionally, our findings suggest that counselors should be aware that even so-called adaptive perfectionists may experience problems. In particular, our results indicate that lofty self-expectations and intense self-scrutiny may make life satisfaction and positive affect elusive for adaptive perfectionists. In fact, counselors have long described perfectionism as a thief that robs people of life satisfaction

and positive affect (e.g., Blatt, 1995). Adaptive perfectionists may be especially susceptible to lower life satisfaction and lower positive affect if events in their lives (e.g., poor exam performance) signal that they are not perfect (Hewitt & Flett, 1993).

LIMITATIONS AND FUTURE DIRECTIONS

The results of the present study should be considered in light of its limitations. Possible mechanisms that might account for differences in profile size proportions were not tested. Future research should consider examining mechanisms such as coping style (Dunkley et al., 2003) or emotion regulation (Aldea & Rice, 2006), which could potentially account for the observed discrepancy in profile size proportions between Canadian and Chinese cultures. As in previous research (Rice et al., 2013; Richardson et al., 2014), the number of individuals categorized as perfectionists was relatively high. This finding may reflect a selection effect in which individuals with higher self-imposed standards are more likely than individuals with lower self-imposed standards to enroll in a university and be classified as either adaptive or maladaptive perfectionists (Richardson et al., 2014). This limitation could be addressed through the use of a sample of North American and Chinese individuals from nonuniversity contexts. Finally, the majority of Canadian and Chinese participants were female. Future research should consider investigating the generalizability of our findings in a more gender-balanced sample.

conclusion

Despite these limitations, the present study is the first to use MLPA to investigate similarities and differences in perfectionism from a person-centered perspective. Our research provides novel evidence that Canadian and Chinese university students are composed of different within-group subpopulations in which the relation between perfectionistic strivings, perfectionistic concerns, and neuroticism differs quantitatively and qualitatively. Moreover, the present study offers preliminary evidence that adaptive perfectionism is more prevalent among Chinese university students, whereas maladaptive perfectionism is more common among Canadian university students. Although further research is needed, the present study provides the first step toward a better understanding of cultural differences in group-based perfectionism, at least among university students; our findings incrementally advance theory, research, and potentially interventions that could be used by university counseling centers.

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