Supplemental Online Appendix

A latent profile analysis of the typology of bulimic symptoms in an indigenous Pacific population: evidence of cross-cultural variation in phenomenology (J.J. Thomas et al., *Psychological Medicine***)**

The following describes the results of a second LPA in which we included any participants who self-reported binge eating and/or purging (i.e., self-induced vomiting, laxative use, or herbal purgative use) in the past 28 days via EDE-Q (n = 395), so as to reflect the psychopathology of binge eating disorder as well as BN.

Results

Latent Profile Analysis

In this second LPA, we evaluated models with one to five classes. To meet the assumptions of the LPA model, we allowed for the conditional dependence of two pair-wise correlations of indicators in which bivariate residuals were greater than 5: (1) driven exercise/overvaluation; and (2) driven exercise/fasting. BIC and cAIC were lowest for the three-class model with 28 parameters (model fit indices available upon request from the first author)[1]. Table 1a displays the relative endorsement of each indicator variable in the three latent classes, and Figure 1a provides a graphical depiction of these data.

The first class comprised 64% (n = 254) of the LPA sample, and its most salient feature was the universal endorsement (100%) of binge eating. Members of this "binge eating class" endorsed relatively low rates of herbal purgative use (25%), self-induced vomiting (10%), and laxative use (2%). More than one third (37%) endorsed fasting, and more than half (61%) endorsed driven exercise. Only one third (33%) described weight and shape as "moderately" to "markedly" important to their self-evaluation.

The second class comprised 18% (n = 72) of the LPA sample and was characterized by concomitant binge eating (100%) and purging (100%). Specifically, self-induced vomiting (79%), herbal purgative use (85%), and laxative use (60%) were common, and the majority (88%) of participants in this "BN-like class" endorsed multiple methods of purging. In addition to high rates of purging, the majority also endorsed driven exercise (90%) and more than half endorsed fasting (58%). Despite the high prevalence of disordered eating behaviors, only about half (53%) stated that weight and shape figured "moderately" to "markedly" into their self-evaluation.

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[1] As a result of our recruitment strategy, participants could be considered nested within school. Class membership was associated with school [χ^2 (33) = 49.26, p = .03] but the effect size was small (Cramer's V = .18). We therefore re-ran our LPA with school as a covariate. Our analyses controlling for school did not replicate our initial 3-class solution, and, furthermore, the optimal solution became ambiguous with regard to number of classes, proportion of participants in each class, and characteristics of each class. Specifically, the new BIC was lowest for a 2-class solution featuring a large binge-eating class and a small BN-like class, whereas, in contrast, the new cAIC was lowest for a 1-class solution that included all of the participants submitted to the LPA. Therefore, we present the results of the 3-class solution, without controlling for school, in this *Supplementary Online Appendix*.

The third class comprised 17% of the sample (n = 69). The most salient feature of this "herbal purgative class" was herbal purgative use (90%). None of the participants in this class endorsed binge eating, and the forms of purging described in DSM-IV, including vomiting (29%) and laxative use (15%), were uncommon. More than half endorsed fasting (59%) and driven exercise (63%). However, only 35% endorsed "moderate" to "marked" overvaluation of shape and weight. Notably, had we not added this culturally relevant item to the EDE-Q, 55% of participants in the herbal purgative class would have been classified as non-purging because of their negative responses to the items probing self-induced vomiting and laxative use.

Validation Analyses

The results of the validation analyses are presented in Table 2a; the p-values in the following text represent Fisher's LSD *post-hoc* pair-wise comparisons, which we conducted to follow-up omnibus tests that already met our $\alpha = .01$ criterion for statistical significance.

Eating pathology. As hypothesized, members of the three latent classes endorsed significantly greater EDE-Q Global, Restraint, Eating Concern, Shape Concern, and Weight Concern scores than asymptomatic participants (all p's < .01). However, the BN-like class endorsed significantly greater global and subscale scores than the binge eating and herbal purgative classes (all p's < .05), and the herbal purgative class endorsed greater EDE-Q Restraint than did the binge eating class (p = .01).

Impairment and comorbid psychopathology. Omnibus differences in clinical impairment (p = .04) and depressive symptoms (p = .01) approached significance. *Post-hoc* comparisons were suggestive of greater clinical impairment in the three latent classes as compared to the asymptomatic group (all p's < .05), as well as greater depression in the BN-like class compared to the binge eating class (p = .002) and asymptomatic group (p = .002).

Demographics. The three classes did not differ from one another or from asymptomatic participants with regard to age, peri-urban school location, relative material poverty, and hunger. However, the BN-like (p = .01) and binge eating (p < .001) classes exhibited significantly higher BMIs than the asymptomatic group.

Post-hoc Class Comparisons of Potential Etiological Variables

Results of class comparisons on potential etiological variables are presented in Table 3a.

Cultural orientation. The three classes did not differ significantly on degree of either global/Western orientation or traditional/ethnic Fijian orientation.

Indigenous practices: kava and dranu use. In comparison to members of the binge eating class, greater proportions of BN-like (p < .001) and herbal purgative (p = .002) participants reported having taken Fijian

herbal preparations to prevent *macake* (characterized by appetite loss) in the past month. The three classes did not differ on frequency of *kava* use.

Peer eating pathology. In comparison to the binge eating class, members of the BN-like and herbal purgative classes estimated that a greater proportion of their close friends had dieted and fasted in the past month (all p's < .01). Moreoever, BN-like participants reported a higher rate of self-induced vomiting/laxative use among their close friends than did members of the binge eating ($p < .001$) or herbal purgative ($p = .004$) classes.

Table 1a. Prevalence of eating disorder symptom endorsement in the LPA-derived binge eating, BN-like, and herbal purgative classes

	Binge Eating (n = 254)	BN-like (n = 72)	Herbal Purgative (n = 69)
Overvaluation of weight and shape			
0 ('Not at all' / Mean of EDE-Q overvaluation items < 1)	60 (23.6%)	4 (5.6%)	10 (14.5%)
1 ('Slightly' / Mean of EDE-Q overvaluation items ≥ 1, < 3)	**111 (43.7%)**	30 (41.7%)	**35 (50.7%)**
2 ('Moderately' to 'Markedly' / Mean of EDE-Q overvaluation items ≥ 3)	83 (32.7%)	**38 (52.8%)**	24 (34.8%)
Binge eating			
0 (None)	0 (0%)	0 (0%)	**68 (100%)**
1 (1-3 episodes)	**221 (87.0%)**	**51 (70.8%)**	0 (0%)
2 (≥ 4 episodes)	30 (13.0%)	21 (29.2%)	0 (0%)
Self-induced vomiting			
0 (None)	**226 (90.4%)**	15 (20.8%)	**48 (70.6%)**
1 (≥ 1 episode)	24 (9.6%)	**57 (79.2%)**	20 (29.4%)
Laxative use			
0 (None)	**245 (98.0%)**	**28 (40.0%)**	**58 (85.3%)**
1 (≥ 1 episode)	5 (2.0%)	42 (60.0%)	10 (14.7%)
Fasting			
0 (None)	**161 (63.4%)**	30 (41.7%)	28 (40.6%)
1 (≥ 1 episode)	93 (36.6%)	**42 (58.3%)**	**41 (59.4%)**
Driven exercise			
0 (None)	97 (39.3%)	7 (9.7%)	25 (36.8%)
1 (1-4 episodes)	**99 (40.1%)**	**39 (54.2%)**	**30 (44.1%)**
2 (≥ 5 episodes)	51 (20.6%)	26 (36.1%)	13 (19.1%)
Herbal purgative use			
0 (None)	**188 (74.9%)**	11 (15.3%)	7 (10.1%)
1 (≥ 1 episode)	63 (25.1%)	**61 (84.7%)**	**62 (89.9%)**

LPA, Latent profile analysis; BN, bulimia nervosa; EDE-Q, Eating Disorder Examination Questionnaire.

Within each cell, the bolded percentage indicates the modal response for that variable within that latent class.

Numbers in some cells do not add up to the total number of participants in that latent class due to missing data on that variable.

Table 2a: Comparison of external validators in the LPA-derived binge eating, BN-like, and herbal purgative classes versus the asymptomatic group

	M (SD) or *n (%)*						
	Binge eating (*n* = 229)	BN-like (*n* = 97)	Herbal Purgative (*n* = 69)	Asymptomatic (*n* = 128)	*F(df)* or $\chi^2(df)$	*p*	Effect size
Eating Pathology							
EDE-Q Global	1.77 (1.06)^a	2.32 (0.91)^b	1.80 (1.05)^a	1.13 (0.95)^c	$F(3, 518) = 23.15$	< .001	$\eta^2_p = .12$
EDE-Q Restraint	0.86 (0.95)^a	1.63 (1.10)^b	1.21 (1.23)^c	0.53 (0.87)^d	$F(3, 518) = 20.54$	< .001	$\eta^2_p = .11$
EDE-Q Eating Concern	1.59 (1.14)^a	1.93 (1.06)^b	1.31 (1.12)^a	0.90 (.91)^c	$F(3, 518) = 17.98$	< .001	$\eta^2_p = .09$
EDE-Q Shape Concern	2.42 (1.44)^a	2.92 (1.26)^b	2.38 (1.47)^a	1.61 (1.32)^c	$F(3, 519) = 15.92$	< .001	$\eta^2_p = .08$
EDE-Q Weight Concern	2.23 (1.43)^a	2.79 (1.30)^b	2.31 (1.33)^a	1.48 (1.30)^c	$F(3, 519) = 16.00$	< .001	$\eta^2_p = .09$
Impairment and Comorbid Psychopathology							
CIA[e]	12.15 (11.53)^a	12.20 (10.37)^a	12.97 (11.93)^a	5.61 (6.35)^b	$F(3, 211) = 2.81$	.04	$\eta^2_p = .04$
CES-D	19.53 (7.31)^a	22.38 (7.35)^b	19.91 (8.33)^{ab}	18.83 (7.75)^a	$F(3, 513) = 6.33$	.01	$\eta^2_p = .02$
Demographics							
Age	16.67 (1.12)	16.85 (1.11)	16.75 (1.07)	16.57 (1.04)	$F(3, 519) = 1.09$	*ns*	$\eta^2_p = .006$
BMI	24.39 (3.52)^{ab}	24.28 (3.08)^a	23.76 (2.72)^{abc}	23.06 (3.29)^c	$F(3, 519) = 4.86$	.002	$\eta^2_p = .03$
Peri-urban school location	132 (52%)	34 (47%)	32 (46%)	63 (49%)	$\chi^2(3) = 1.01$	*ns*	$V = .04$
Relative material poverty	148 (58%)	43 (60%)	43 (62%)	73 (57%)	$\chi^2(3) = 0.57$	*ns*	$V = .03$
Hunger due to insufficient food (past 30 days)	114 (45%)	33 (46%)	21 (31%)	48 (38%)	$\chi^2(3) = 5.76$	*ns*	$V = .11$

LPA, Latent profile analysis; BN, bulimia nervosa; EDE-Q, Eating Disorder Examination Questionnaire; CIA, Clinical Impairment Assessment; CES-D, Center for Epidemiologic Studies Depression Scale; BMI, body mass index; η^2_p, partial eta squared; *V*, Cramer's *V*; *df*, degrees of freedom; *SD*, standard deviation; *ns*, not significant.

[a, b, c] Means and percentages with different superscripts within each row differ significantly from one another (utilizing Fisher's LSD *post-hoc* comparisons to follow up significant omnibus *F* tests, and Bonferroni corrections to follow up significant omnibus χ^2 tests).

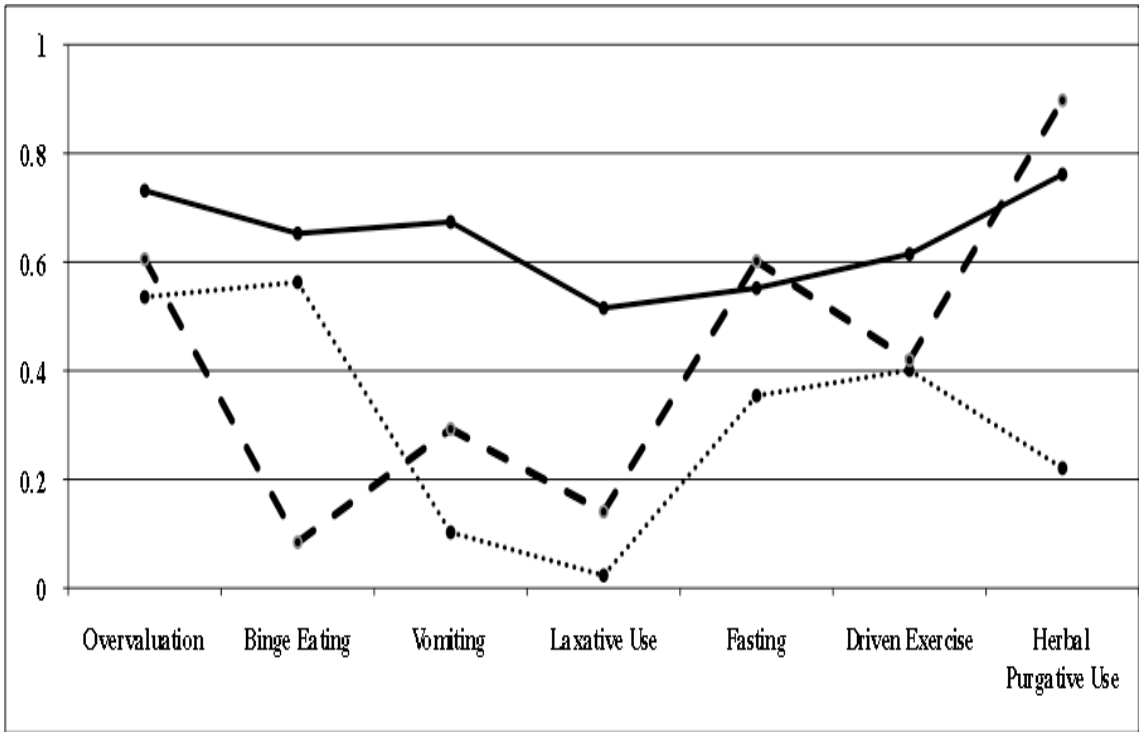
[e] Data available for Stage 2 participants only (*n* = 215).

Table 3a: Class comparisons of potential etiological variables in the LPA-derived binge eating, BN-like, and herbal purgative classes

	M (SD) or *n* (%)					
	Binge eating (*n* = 229)	BN-like (*n* = 97)	Herbal Purgative (*n* = 69)	*F(df)* or $\chi^2(df)$	*p*	Effect size
Cultural Orientation						
Global/Western orientation scale	4.40 (0.86)^a	4.58 (0.89)^b	4.53 (0.84)^{ab}	$F(2, 392) = 1.67$	*ns*	$\eta^2_p = .008$
Ethnic Fijian orientation scale	4.75 (1.36)	4.88 (1.52)	4.87 (1.67)	$F(2, 392) = 0.35$	*ns*	$\eta^2_p = .002$
Indigenous Health Practices						
Kava use (Likert frequency in past month)	1.37 (0.51)	1.33 (0.50)	1.32 (0.65)	$F(2, 392) = 0.26$	*ns*	$\eta^2_p = .001$
Indigenous herbal medicine use to prevent *macake* (yes in past month)	83 (34%)^a	46 (64%)^b	35 (57%)^b	$\chi^2(2) = 30.25$	< .001	$V = .29$
Eating Pathology in Close Friends						
Dieting	1.73 (0.69)^a	2.11 (0.75)^b	2.07 (0.85)^b	$F(2, 389) = 11.49$	< .001	$\eta^2_p = .06$
Fasting	1.41 (0.63)^a	1.75 (0.92)^b	1.72 (0.73)^b	$F(2, 389) = 9.96$	< .001	$\eta^2_p = .05$
Vomiting/laxative use	1.18 (0.47)^a	1.53 (0.75)^b	1.26 (0.56)^a	$F(2, 388) = 10.98$	< .001	$\eta^2_p = .06$

LPA, Latent profile analysis; BN, bulimia nervosa; *Macake*, indigenous illness characterized by appetite loss; η^2_p = partial eta squared; *V* = Cramer's *V*; *df*, degrees of freedom; *ns*, not significant.

Figure 1a. Relative endorsement of eating disorder symptom indicators in the binge eating class (represented by the dotted line), the BN-like class (represented by the solid line), and herbal purgative class (represented by the dashed line)



For the dichotomous variables (vomiting, laxative use, fasting, and herbal purgative use), relative endorsement is plotted as the percentage of participants in each class who endorsed that symptom. For ordinal variables (overvaluation, binge eating, and driven exercise), relative endorsement is plotted as the mean of the three ordered categories (assigned point values of 0, 1, and 2 for increasingly greater frequencies) divided by two, so as to fit on a 0-1 scale.