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Factorial integrity and validation of the Eating Pathology Symptoms Inventory (EPSI)

Kathryn A. Coniglio[a,*,1,3], Kendra R. Becker[b,c,1,4], Nassim Tabri[d], Ani C. Keshishian[b], Joshua D. Miller[e], Kamryn T. Eddy[b,c,2], Jennifer J. Thomas[b,c,2]

[a] Department of Psychology, Rutgers, The State University of New Jersey, United States of America
[b] Eating Disorders Clinical and Research Program, Massachusetts General Hospital, United States of America
[c] Department of Psychiatry, Harvard Medical School, United States of America
[d] Department of Psychology, Carleton University, Canada
[e] Department of Psychology, University of Georgia, United States of America

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ABSTRACT

The Eating Pathology Symptoms Inventory (EPSI) is a 45-item self-report measure of eating pathology designed to be sensitive in assessing symptoms among diverse populations of individuals with disordered eating. The current study represents the first external validation of the EPSI as well as the first to examine the factor structure in an outpatient eating disorder clinic sample. We conducted an exploratory factor analysis in three separate samples: an outpatient clinic sample (n = 284), a college sample (n = 296), and a community sample (n = 341) and compared the observed factor structures to the original 8-factor solution proposed by Forbush et al. (2013). We also investigated whether the subscales correlated with the Eating Disorder Examination Questionnaire (EDE-Q) and a clinical impairment measure among the outpatient clinic sample. Results suggested between 7 and 8 factors for each of the three samples. Our findings largely replicated those of the original EPSI development study, excepting some deviations in the Muscle Building, Cognitive Restraint, and Excessive Exercise subscales. However, confirmatory factor analysis and exploratory structural equation modeling produced poor model fit, which may be related to the item heterogeneity within many of the subscales. Finally, eating disorder attitudes and behaviors assessed by the EPSI were significantly correlated with the EDE-Q and with clinical impairment. Overall, our results highlight both strengths and limitations of the EPSI. Findings provide preliminary support for the use of the EPSI among research with diverse populations, and present several avenues for future research for enhancing clinical utility.

1. Introduction

Eating pathology has become more widely recognized in diverse populations (Feldman & Meyer, 2010; Pike, Hoek, & Dunne, 2014; Raevuori, Keski-Rahkonen, & Hoek, 2014). However, common measures of disordered eating under-assess symptoms that may be more prevalent in men (Spillane, Boerner, Anderson, & Smith, 2004), are less accurate in assessing eating pathology among individuals across weight and age spectrums (Hrabosky et al., 2008), and confuse or combine distinct symptom constructs such as restraint and restriction (Stice, Cooper, Schoeller, Tappe, & Lowe, 2007). Further, factor structures of popular measures of eating pathology are inconsistent across studies (Forbush et al., 2013; Thomas, Roberto, & Berg, 2014). The Eating Pathology Symptoms Inventory (EPSI; Forbush et al., 2013) was

* Corresponding author at: Department of Psychology, Rutgers, The State University of New Jersey, 152 Frelinghuysen Rd, Piscataway, NJ 08854, United States of America.
E-mail addresses: kathryn.coniglio@rutgers.edu (K.A. Coniglio), krbecker@mgh.harvard.edu (K.R. Becker).
[1] Co-first authors.
[2] Co-senior authors.
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designed to be a "comprehensive multidimensional measure of eating pathology" (p. 859) that could be clinically valuable to a wider range of individuals and maintain a consistent factor structure across samples.

Factor replication across studies is a prerequisite for unbiased comparisons with measured constructs across groups. Without factorial integrity, measures may distort findings and lead to inaccurate inferences about populations. The Eating Disorders Examination – Questionnaire (EDE-Q; Fairburn & Beglin, 2008) does not typically demonstrate the four content-based subscales originally generated by the authors (Darcy, Hardy, Crosby, Lock, & Peebles, 2013). Items often do not group together according to the purported scales, and instead show stronger correlations with items on different subscales (Becker et al., 2010; Peterson et al., 2007). Similarly, the abbreviated form of the Eating Attitudes Test (EAT-26; Garner, Olmstead, Bohr, & Garfinkel, 1982) has shown variant factor structures from the original three-factor solution (Doninger, Enders, & Burnett, 2005).

To date, there have been no external validation studies of the EPSI in college or community samples, nor validation of the measure in an outpatient eating disorder clinic. The EPSI may be both a psychometrically valid and clinically valuable measurement, however, it remains 1) to be evaluated in less severe presentations of eating pathology, compared to patients in inpatient and partial hospitalization programs, and across the full spectrum of eating disorder diagnoses, and 2) to be replicated in college and community samples. The primary aim of this study was to evaluate the factor structure of the EPSI in three separate samples: an outpatient eating disorder clinic, an undergraduate college, and the community. As part of demonstrating clinical validity, it is also necessary that the proposed factors of the EPSI accurately reflect symptoms relevant to specific eating disorder diagnoses and relate in meaningful ways with clinical severity. Therefore, a secondary aim was to examine whether individuals with an eating disorder score as expected on the EPSI subscales relevant to their disorder, and whether the EPSI subscales correlate with relevant EDE-Q items and subscales, as well as clinical impairment.

2. Method

2.1. Participants

2.1.1. Sample 1

Participants presented to an outpatient eating disorders treatment center at an academic medical center for an initial evaluation. Nearly all feeding and eating disorder diagnoses were represented (see Table 1) and participants' age ranged from 10 to 78 (M = 26.7, SD = 13.2). Participants received a password-protected email and completed questionnaires online via REDCap (Harris et al., 2009) prior to their appointment. They were also given the option to save their data for research purposes. Participants were diagnosed by a licensed clinical psychologist (Ph.D.) or psychiatrist (M.D.). Clinicians conferred diagnosis using an unstructured clinical interview based on DSM-5 criteria, and discussed uncertainties at a weekly case conference. Between 2013 and 2017, 284 patients (76%) consented to save their data for research, and were included in this study.

2.1.2. Sample 2

Participants (n = 296) were undergraduate students ranging in age from 18 to 25 years (M = 19.4, SD = 1.3). Participants were enrolled in introductory psychology courses and volunteered to complete the EPSI as part of an online study from the university's research pool website for partial course credit.

2.1.3. Sample 3

Participants (n = 341) were recruited via Amazon.com's Turk Prime, an internet-based research platform designed specifically for behavioral research (Litman, Robinson, & Abberbock, 2017). Participants ranged in age from 18 to 70 years (M = 37.2, SD = 10.9), and responded to a recruitment notice for a study assessing eating behaviors among members of the community. Comparable with other Turk Prime studies, participants were compensated $2.00 for their time (Tabri, Wohl, Eddy, & Thomas, 2017). To ensure data integrity, participants who spent less than one SD below the mean time (i.e. < 3 s per item) to complete the battery were excluded (n = 49).

Data collection for each sample received annual approval by the respective institutional review boards (IRB).

Table 1
Demographic characteristics.[a]

	Clinic (N = 284)	College (N = 296)[b]	Community (N = 341)
Mean age (standard deviation)	26.71 (13.17)	19.35 (1.29)	37.21 (10.90)
Adolescents < 18 years old, n (%)	68 (23.94)	0 (0)	0 (0)
Mean BMI[d] centile (SD)	49.88 (33.72)	N/A	N/A
Adults ≥ 18 years old, n (%)	216 (76.06)	296 (100)	341 (100)
Mean BMI[d] (SD)	24.44 (8.31)		28.43 (7.72)
Sex, n (%)			
Male	43 (15.1)	107 (36.4)	174 (51)
Female	239 (84.2)	187 (63.6)	166 (48.7)
Other	2 (0.7)	0 (0)	1 (0.3)
Diagnosis, n (%)			
Anorexia nervosa – binge/purge	17 (6.0)		
Anorexia nervosa – restricting	44 (15.4)		
Bulimia nervosa	54 (19.0)		
Binge eating disorder	37 (13.0)		
Avoidant/restrictive food intake disorder	51 (18.0)		
Rumination disorder	2 (0.7)		
OSFED[e] – Atypical anorexia nervosa	31 (10.9)		
OSFED[e] – Subthreshold bulimia nervosa	8 (2.8)		
OSFED[e] – Subthreshold binge eating disorder	5 (1.8)		
OSFED[e] – Purging Disorder	5 (1.8)		
OSFED[e] – Night Eating Syndrome	3 (1.1)		
OSFED[e] – Other	13 (4.6)		
Unspecified Feeding or Eating Disorder	5 (1.8)		
Subclinical Eating Pathology	9 (3.1)		
Ethnicity, n (%)			
Hispanic/Latino	12 (4.2)	14 (4.8)	16 (4.7)
Not Hispanic/Latino	272 (95.8)	279 (95.2)	325 (95.3)
Race[c], n (%)			
American Indian/Alaska Native	2 (0.7)	1 (0.3)	10 (2.9)
Black/African American	13 (4.6)	27 (9.1)	39 (11.4)
Asian	17 (6)	42 (14.2)	26 (7.6)
Native Hawaiian/Other Pacific Islander	1(0.4)	1 (0.3)	1 (0.3)
White	260 (91.5)	228 (77)	279 (81.8)

[a] Height and weight data were not collected in the college sample, and thus BMI data could not be included.
[b] Two individuals in the college sample declined to provide age and sex, and three declined to provide ethnicity.
[c] Note: Individuals were given the option to select more than one category for Race.
[d] Body Mass Index.
[e] Other Specified Feeding or Eating Disorder.

2.2. Measures

2.2.1. Demographics

Each sample completed a brief demographic questionnaire assessing sex, age, race, ethnicity, and body mass index (BMI).