



The Minnesota Eating Behavior Survey: A brief measure of disordered eating attitudes and behaviors

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Received 14 July 2004; received in revised form 3 December 2004; accepted 17 December 2004

Abstract

This article describes details of the development and psychometric characteristics of a brief self-report inventory for assessing attitudes and behaviors symptomatic of eating disorders that is currently in use in a longitudinal study of over 700 families with 11-year-old or 17-year-old twin girls. The Minnesota Eating Behavior Survey (MEBS), formerly the Minnesota Eating Disorder Inventory, is a 30-item measure developed for use with children as young as 10 years as well as adults. An examination of the MEBS's psychometric properties in a large, community sample of girls, women, and men demonstrated good factor congruence, internal consistency reliability, three-year stability, as well as evidence of concurrent and criterion validity. This questionnaire has promise as a screening and assessment measure for eating disturbance in cross-sectional and longitudinal research involving individuals of a wide range of ages.

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Keywords: Test construction; Test validity; Questionnaires; Anorexia nervosa; Bulimia; Symptoms

1. Introduction

Many people in Western cultures—especially adolescent girls and young women—experience eating pathology, although relatively few of these individuals have anorexia nervosa or bulimia nervosa.

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Approximately 0.5% of females report a lifetime history of anorexia nervosa, and 1% to 3% of women have a lifetime history of bulimia nervosa. Prevalence of both disorders in males is about one-tenth that of females (American Psychiatric Association, 2000). Eating pathology is believed to occur on a continuum of severity; accordingly, approximately twice as many individuals have been shown to experience subthreshold or atypical eating disorders (EDs) (Fairburn & Walsh, 2002; Shisslak, Crago, & Estes, 1995). Furthermore, severity of eating pathology tends to vary over time. For example, a subset of subclinical cases will eventually develop diagnosable eating disorders, and some with full-fledged EDs will move to subclinical severity (Keel, Mitchell, Miller, Davis, & Crow, 1999). To assess a spectrum of eating pathology and be able to track over time changes in attitudes and behaviors symptomatic of eating disorders, researchers require focused measures that assess eating pathology on a continuum of severity, and that may be used as readily with children as with adults. A need is especially clear for suitable self-report measures tapping a range of these symptoms in community samples, in whom a minority will meet criteria for an eating disorder but many more will experience subthreshold symptoms. It is more cost-effective to screen large samples, such as those participating in community-based studies, using self-report as opposed to interview measures (Garner, 2002).

A number of self-report measures of eating pathology exist. One of the most frequently used self-report measures of eating pathology is the Eating Disorder Inventory (EDI, Garner, Olmsted, & Polivy, 1983a; Garner, Olmsted, & Polivy, 1983b). This 64-item, theoretically derived measure was devised to assess attitudinal, behavioral, and personality characteristics that had been observed among individuals with eating disorders (Garner et al., 1983b). It includes eight subscales, three of which (Bulimia, Drive for Thinness, Body Dissatisfaction) consist of items assessing behaviors and attitudes directly related to eating and weight, and one (Interceptive Awareness) of which contains two items related to eating behaviors. The remaining four subscales (Ineffectiveness, Perfectionism, Interpersonal Distrust, and Maturity Fears) focus on psychological constructs hypothesized to be relevant to the aetiology of eating disorders. Items are written at the fifth-grade reading level (Williamson, Anderson, Jackman, & Jackson, 1995).

The EDI was developed using a criterion group of female patients with anorexia nervosa (both restrictive and bulimic subtypes) with a mean age of approximately 22 years, and a comparison sample of female university students with a mean age of approximately 20 (Garner et al., 1983a). Since its inception, the EDI and its 91-item revision, the EDI-2 (Garner, 1991), have been used frequently with both clinical and non-clinical populations of varying ages. Among the diverse samples in which the EDI has been administered are some that differ quite dramatically from the normative sample, including community and school-based samples of youths as young as 11 years (McCarthy, Simmons, Smith, Tomlinson, & Hill, 2002; Netemeyer & Williamson, 2001; Rosen, Silberg, & Gross, 1988; Shore & Porter, 1990).

Perhaps because of a paucity of brief, quantitative measures of eating disorder core diagnostic features, it is not uncommon for researchers to use selected subscales of the EDI to assess focal eating disorder-related symptom areas (e.g., Jones, Bennett, Olmsted, Lawson, & Rodin, 2001; Vohs, Bardone, Joiner, & Abramson, 1999). Often investigators do not report the reliability and validity of individual subscales when administered alone, so the psychometric implications of this practice are unclear. Furthermore, some have noted problems with using the EDI with nonclinical samples. Factor analyses of the EDI in nonclinical samples frequently have not supported the rationally derived 8-factor solution for the EDI (e.g., Bennett & Stevens, 1997; Schoemaker, van Strien, & van

der Staak, 1994), suggesting a need for caution when using the EDI in community samples. The variability in factor congruence across samples also raises particular concern about the practice of using selected subscales of the EDI in nonclinical populations. Other clinical research suggests that several of the EDI's subscales may reflect general psychological disturbance and not pathology specific to eating disorders (Cooper, Cooper, & Fairburn, 1985; Hurley, Palmer, & Stretch, 1990). Finally, the EDI was developed for use with adults, not prepubescent children, so its language may not be readily comprehensible to those with reading abilities below the fifth grade level.

Among the other self-report scales used to assess pathology associated with eating disorders are the Eating Disorder Examination Questionnaire (EDE-Q) (Fairburn & Beglin, 1994), Eating Attitudes Test (EAT) (Garner & Garfinkel, 1979), Setting Conditions for Anorexia Scale (SCANS) (Williamson et al., 1995), Multiaxial Assessment of Eating Disorder Symptoms (MAEDS) (Anderson, Williamson, Duchmann, Gleaves, & Barbin, 1999), Bulimia Test-Revised (BULIT-R) (Thelen, Farmer, Wonderlich, & Smith, 1991), and the Stirling Eating Disorders Scales (SEDS) (Williams et al., 1994). Some of these questionnaires emphasize symptoms of either anorexia nervosa or bulimia nervosa but not both (e.g., EAT, SCANS, and BULIT-R), and all were developed for use with adults and late teenagers and so may require adaptation for use with children (Williamson et al., 1995). Comprehensibility may be problematic when using questionnaires formulated for adults with children: for example, a study of the SEDS's psychometric properties among teenagers suggested that younger participants may have had difficulty understanding certain items and concepts (Campbell, Lawrence, Serpell, Lask, & Neiderman, 2002). Questionnaires measuring children's attitudes toward eating behaviors include the Children's Eating Attitude Test (ChEAT) (Maloney, McGuire, & Daniels, 1988) and the Eating Disorder Inventory for Children (EDI-C) (Garner, 1991), an unpublished measure. No published research has assessed the psychometric performance of the ChEAT or EDI-C in adults, so their suitability for use with individuals of a wide range of ages is unknown.

In the early 1990s, the Minnesota Twin Family Study searched for a measure that would allow them to examine disordered eating longitudinally and across cohorts that ranged in age from 11 to adulthood. A comprehensive search of existing measures of eating pathology was conducted and none was found that met these specific needs. Consequently, a short self-report questionnaire was developed to assess a range of behaviors and attitudes associated with eating disorders among community individuals of varying ages, ranging from prepubescent children to adults, for use in this longitudinal study of over 700 families of adolescent twins. This measure, the Minnesota Eating Behavior Survey¹ (MEBS), was designed to (a) provide quantitative indices of behavioral and attitudinal symptoms associated with anorexia nervosa, bulimia nervosa, and binge eating disorder, (b) be brief, (c) employ a simple response format easily understood by those with limited exposure to psychological questionnaires, and (d) use relatively simple language. A brief description of the development and factor analysis of the MEBS was previously presented (Klump, McGue, & Iacono, 2000). In this paper, we give further details of the development of the MEBS, assess its factor congruence, and assess its reliability and validity in children, adolescents, and adults.

¹ The Minnesota Eating Behavior Survey (MEBS; previously known as the Minnesota Eating Disorder Inventory (M-EDI)) was adapted and reproduced by special permission of Psychological Assessment Resources, 16204 North Florida Avenue, Lutz, Florida 33549, from the Eating Disorder Inventory (collectively, EDI and EDI-2) by Garner, Olmstead, Polivy, Copyright 1983 by Psychological Assessment Resources. Further reproduction of the MEBS is prohibited without prior permission from Psychological Assessment Resources.

2. Method

2.1. Participants

Individuals eligible for this study included reared-together female twins and their mothers and fathers participating in the population-based Minnesota Twin Family Study (MTFS). The MTFS is an ongoing longitudinal study of two age cohorts of male and female adolescent twins and their parents (for a detailed description of the design and methods of this study, see [Iacono, Carlson, Taylor, Elkins, & McGue, 1999](#)). Families were recruited for study participation when the twins were aged about 11 or 17; follow-up assessments occur every three years for each cohort. The aim of the MTFS is to evaluate genetic and environmental influences on the development of substance abuse and related psychological disorders, including eating disorders.

Approximately 700 same-sex female twin pairs and their parents are taking part in this study. Participating youth gave written informed assent or consent as appropriate, and their parents gave written informed consent. An examination of characteristics of study participants relative to eligible twin families who did not participate showed few large differences between groups, with small differences in socio-economic status and no differences in parental psychopathology ([Iacono et al., 1999](#)). These results suggest that participants are broadly representative of Minnesota twin families of the same ages. For any given birth year, the MTFS has been successful at recruiting approximately 84% of twin births in the state of Minnesota for study participation ([Iacono et al., 1999](#)).

The sample for the present study includes 804 female twins in the 11-year-old (“younger”) cohort, 643 female twins in the 17-year-old (“older”) cohort, 735 mothers of female twins, and 650 fathers of female twins. As noted, the MTFS is a longitudinal study with 3-year assessment periods. Data for the girls and mothers of younger twins are presented from both the intake and first follow-up assessments (i.e., when the youths are about 14 and 20 years old). At follow-up, complete data were available for 85.7% of the younger cohort ($n=689$) and 97.7% of the older cohort ($n=628$). By contrast, follow-up MEBS data were not available for mothers of older twins, or for any fathers; as a result their data are limited to the intake assessment period.

Detailed information regarding the demographics of this sample at intake can be found elsewhere ([Iacono et al., 1999](#)). In brief, 97.9% of the sample was Caucasian; mean years of education were 13.7 for mothers and 14.0 for fathers. Participant mean ages were as follows: younger girls, 11.7 years (S.D.=0.5) at intake and 14.8 years (S.D.=0.6) at follow-up; older girls, 17.4 years (S.D.=0.5) at intake and 20.7 (S.D.=0.6) at follow-up; mothers, 41.9 years (S.D.=5.3) at intake and 42.7 years (S.D.=4.6) at follow-up; and fathers, 43.9 years (S.D.=6.0) at intake.

2.2. Measures

2.2.1. Development and description of the Minnesota Eating Behavior Survey (MEBS)

The MEBS is a 30-item self-report questionnaire that was originally administered to the two MTFS age cohorts of children and their parents. MEBS items came from two sources. First, a subset of 23 items assessing eating disordered cognitions and behaviors, as opposed to personality characteristics, were identified from three EDI subscales: Body Dissatisfaction, Bulimia, and Drive for Thinness. In addition, two behavioral items were drawn from the Interoceptive Awareness

subscale.² The language of each of these items was simplified to increase the likelihood that individuals as young as 10 years old would readily comprehend it. For example, the EDI item “I am preoccupied with the desire to be thinner” was revised in the MEBS to read, “I’m always wishing I was thinner.” Second, MTFS researchers developed five items to assess compensatory behaviors not already included in the EDI, including self-induced vomiting, abuse of laxatives, diuretics, and diet pills, and exercise. The number of response alternatives was reduced to two (“true” and “false”), again to increase the simplicity of the instrument for use with the 10- and 11-year-old study participants and to ease administration and interpretation.³

As described in detail by Klump et al. (2000), previous exploratory factor analyses of MEBS responses from both age cohorts of girls at intake yielded four subscales. In summary, three factors produced an eigenvalue greater than 1.00, and the fourth factor (Weight Preoccupation), with an eigenvalue of 0.85, was retained because of its similarity to the EDI scale Drive for Thinness and its high internal consistency (0.78–0.81). Items were retained if they had factor loadings between +0.3 and –0.3 and did not load higher on any other factor; five items were included on subscales despite factor loadings less than 0.3 because they improved the scale’s internal consistency and their content fit the factor. The four factors were labelled Body Dissatisfaction (assessing discontent with body size and shape), Compensatory Behavior (assessing the use of, and thoughts of using, self-induced vomiting and other inappropriate compensatory behaviors to control weight), Binge Eating (assessing binge eating, secretive eating, and preoccupation with food), and Weight Preoccupation (assessing preoccupation with weight, eating, and dieting).

Regarding the administration of the MEBS, the only specific instruction included is “Circle One,” noted directly above columns of “T”s (for true) and “F”s (for false) on the right side of the questionnaire, with one “T” and “F” corresponding to each item. No time frame is specified, but as this measure is intended to assess current disordered eating attitudes and behaviors, all questions are written in the present tense.⁴

To score the MEBS, each item answered in the symptomatic or pathological direction (usually “yes”) receives 1 point and receives no point if the item was scored in the non-pathological direction (usually “no”). Four items require reverse scoring to enable interpretation of the total score and subscale scores as

² Note that the proportion of items derived from the EDI vs. new items presented here vary by one item from those presented in Klump et al. (2000) due to a typographical error in the previous report. The correct number of items drawn from the original EDI is 25, as noted here.

³ At 3-year follow-up, the response format of the MEBS was changed to a 4-point scale (Definitely True, Probably True, Probably False, and Definitely False) to capture a wider range of responses. By then, all participants were at least 13 years of age and so a very simple, dichotomous response format was deemed less important. For the purposes of the present analyses, all follow-up MEBS data were recorded to correspond to the dichotomous format used at intake, thus Definitely and Probably True responses, and Definitely and Probably False responses, were combined. This modification was necessary to examine stability of responses across intake and follow-up assessments. We conducted all of the study’s analyses with both the 2-point and 4-point response formats (analyses not shown). Results were essentially identical across these formats. Thus, results are reported here for the 2-point scales only.

⁴ In addition to “Circle One,” more complex instructions are included on the version of the MEBS with a 4-point response format. Specifically, they state, “Instructions: This questionnaire contains a series of statements that you can use to describe your perceptions about eating and your body. After each item is a scale like this: T t f F. The meaning of the four possible answers is: T=Definitely True; t=Probably True; f=Probably False; F=Definitely False. You should read each statement and decide how you feel about it. First decide if the statement is generally true or generally false of you. Then, indicate how certain you feel—is this definitely or only somewhat accurate—by circling the letter that corresponds with your answer. So, if the statement or item is definitely true for you, then you should circle the T like this: (*example of correctly circled “T” here*). If the statement or item is probably true for you (more true than false), then you should circle the t like this: (*example of correctly circled “t” here*).” Like the version with a dichotomous response format, no specific time frame is specified.

indices of pathological eating attitudes and behaviors. MEBS total scores comprise the sum of scores from all 30 items. Each of the four subscale scores is obtained by summing the scores of all items that comprise the subscale.

The following rules were followed regarding analyses of missing MEBS data. If, for any individual's MEBS total score, <10% of the items were missing, scores were prorated. If >10% of items were missing, the total score was coded as missing. MEBS subscale scores were not prorated due to the small number of items per subscale. Therefore, participants with missing values on these subscales were not analyzed in subscale analyses.

2.2.2. *Eating Disorder Examination Questionnaire (EDE-Q) (Fairburn & Beglin, 1994)*

We examined the convergent validity of the MEBS among girls with another measure of eating pathology, the EDE-Q (Fairburn & Beglin, 1994). The EDE-Q is a 36-item self-report measure of psychopathology specific to eating disorders that is based upon a structured interview, the Eating Disorder Examination (EDE). EDE-Q items focus on eating disordered attitudes and behaviors over the past 28 days. The EDE-Q has four subscales: Restraint, Eating Concern, Shape Concern, and Weight Concern (Cooper Cooper, & Fairburn, 1989). The EDE-Q uses a 7-point, forced-choice coding scale in which higher numbers correspond to greater severity of a particular feature. The EDE-Q subscales have excellent internal consistency and short-term test–retest reliability (Luce & Crowther, 1999). Comparisons of the EDE-Q with the EDE have found substantial correspondence in reports of individuals' eating pathology on the two measures for unambiguous symptoms such as self-induced vomiting; by contrast, more complex constructs such as binge eating seem to be over reported on the questionnaire version (Black & Wilson, 1996; Fairburn & Beglin, 1994; Wilfley, Schwartz, Spurrell, & Fairburn, 1997). Both age cohorts of girls completed the EDE-Q at the three-year follow-up assessment only, when they were aged approximately 14 and 17 years, and hence were close to the age range of previous EDE-Q research participants (Fairburn & Beglin, 1994). If any items were missing from a scale for an individual, that scale was coded as missing; thus, no EDE-Q scales were prorated. The EDE-Q was not included in the mothers' or fathers' assessments so we could not assess convergent validity for these cohorts.

2.2.3. *Structured diagnostic interview*

Girls were independently interviewed by MTFS staff regarding lifetime symptoms of anorexia nervosa (AN), bulimia nervosa (BN), and binge eating disorder (BED) with the Eating Disorders Questionnaire (EDQ). The EDQ is a version of Module H of the Structured Clinical Interview for DSM-III-R (SCID) (Spitzer, Williams, Gibbon, & First, 1987) that was modified to include coverage of BED symptoms, and with probes and questions added to ensure complete assessment of eating disorder symptoms. Given the low frequency of BED diagnoses among the girls, only AN and BN diagnoses were examined in the present study.

Interviews were administered in person by trained bachelor and master's degree-level interviewers or clinical psychology graduate students, who coded each symptom as present, subthreshold (in severity, frequency, or pervasiveness), or absent. A team of two or more advanced clinical psychology graduate students reviewed the structured interviews for each case, supplemented with interview audiotapes as needed. After teams reached consensus regarding the presence or absence of each symptom, lifetime diagnoses were made by computer algorithm. In the present study, *DSM-IV* (American Psychiatric Association, 1994) criteria were used to define AN and BN (American Psychiatric Association, 1994) at

two levels of certainty: *definite* (full *DSM* diagnostic criteria met) and *probable* (one criterion fewer than the minimum *definite* definition; this certainty level is equivalent to a subthreshold eating disorder diagnosis). For the diagnosis to be given at any certainty level, defining symptoms (e.g., low weight in AN and binge eating and purging in BN) and duration were required to be at least subthreshold, or just shy of the frequency criterion for BN.

Agreement for AN and BN diagnoses between consensus teams was assessed. Kappas of self-reported eating disorder diagnosis were adequate at 0.63 for AN and 0.82 for BN.

2.3. *Eating disorder and control groups*

Using consensus diagnoses, girls were divided into eating disorder or control groups for analyses of the discriminant validity of the MEBS. Specifically, all girls who had received a probable or definite lifetime diagnosis of AN ($n=24$; mean [standard deviation] age=17.8 [2.5]) or BN ($n=14$; mean [standard deviation] age=18.5 [2.0]) were included in the AN or BN group, respectively. A composite group, “Any Eating Disorder,” included participants who had either an AN or BN diagnosis at a definite or probable level of certainty. Control groups were created by drawing from a random sample of age cohort-matched girls who had no reported eating disorder symptoms by interview, and who were not co-twins of a girl in an eating disorder group. Additionally, we ensured each control group contained no twin pairs. Data for the group of “ED girls” were included in tables where appropriate to describe the psychometric functioning of the MEBS in a group of individuals with probable or definite eating disorders.

2.4. *Statistical analyses*

All MEBS and EDE-Q scores were transformed ($\log_{10}x+1$) prior to analyses to correct for the positively skewed data. According to convention, however, and to facilitate interpretation, we used raw data to calculate correlations, and report raw means and standard deviations in tables. A conservative p -value of 0.01 was adopted throughout to control the Type I error that might result from the non-independent observations of twins.

To evaluate the fit of the original factor structure with different age groups and samples, following the procedure described by McCrae, Zonderman, Costa, Bond, and Paunonens (1996), we examined the congruence of the four MEBS factors identified in the initial factor analysis, which was based on responses of a subset of MTFs 17-year-old girls at intake (for details of the original factor analysis, see Klump et al., 2000). Note that we assessed factor congruence for some of the same participants from the 17-year-old cohort at a different time point (three years later), as well as several other groups of subjects for whom factor congruence had not yet been assessed. As with the original factor analysis (Klump et al., 2000), four-factor solutions with oblimin rotation were derived separately for four cohorts in the present study (younger and older girls at follow-up, mothers, and fathers). Because the small number of girls with a probable or definite eating disorder diagnosis ($n=38$) would lead to unstable, unreliable results in a factor analysis, we did not examine the fit of the original four-factor solution in this group. MEBS structure matrix factor loadings for the original sample were correlated with each cohort's structure matrix factor loadings to yield factor congruence coefficients.

For each cohort, to assess the consistency of participants' responses across items, we calculated coefficient alpha for the items making up the MEBS total score and each subscale score. Convergent validity with the EDE-Q and 3-year test–retest reliability between intake and follow-up were examined

using Pearson product moment correlations. We gathered evidence for criterion validity by examining differences in MEBS scores between groups of girls with lifetime probable or definite AN or BN and age-matched, non-eating disordered control participants. These analyses were run separately for identical and fraternal twins to ensure that findings were consistent across the two groups. No substantial differences were found for these two samples (analyses not shown), and thus results are reported for the combined twin sample only. We also considered using other statistical techniques (e.g., hierarchical linear models) to correct for twinship in mean comparisons across eating disordered and control groups. However, there were no co-twins in the control group, and only two and three sets of co-twins in the AN and “Any Eating Disorder” groups, respectively. Because of the very small number of twin pairs in the groups compared, we concluded that traditional *t*-tests were adequate.

3. Results

3.1. Factor congruence

The factor congruence coefficients for each cohort in the present study ranged from 0.48 to 0.97 (see Table 1). Overall, the original factor structure replicated across cohorts: the highest correlations occurred between the same factors, and typically correlations with other factors were relatively low. However, for the Compensatory Behavior factor, a substantial correlation (younger cohort, 0.52; mothers, 0.37; fathers, 0.30) existed with the Binge Eating factor.

3.2. MEBS descriptive analyses

Observed means and standard deviations for the MEBS total score and subscale scores are reported in Table 2 separately for each cohort, which includes both intake and follow-up MEBS scores for the younger and older cohorts of girls, and mothers’ and fathers’ scores at intake only. Intake data for the subjects with probable or definite eating disorders are also included. In general, MEBS scale means were relatively low among fathers and high among girls with eating disorder diagnoses. Apart from these groups, in general 17-year-old girls tended to report the most disordered eating symptoms and 11-

Table 1

Minnesota Eating Behavior Survey factor congruence coefficients^a for girls (follow-up), and mothers, fathers, and girls with an eating disorder (intake)

Factors	Younger cohort, age 14 (<i>n</i> =664–689) ^b	Older cohort, age 20 (<i>n</i> =619–628) ^b	Mothers (<i>n</i> =717–735) ^b	Fathers (<i>n</i> =646–650) ^b
Factor 1: body dissatisfaction (BD)	0.89	0.97	0.85	0.86
Factor 2: compensatory behavior (CB)	0.60	0.79	0.48	0.56
Factor 3: binge eating (BE)	0.80	0.73	0.80	0.66
Factor 4: weight preoccupation (WP)	0.96	0.85	0.80	0.80

^a Factor congruence coefficients consist of Pearson correlations of factor loadings for the original sample of 17-year-old girls with factor loadings for each of the other cohorts listed in the table.

^b Sample sizes varied due to missing data and the decision not to prorata subscales for any participant if there were any missing values. The ranges presented represent the maximum and minimum sample sizes available for these correlational analyses for each MEBS factor within each cohort.

Table 2

Mean scores and alpha reliabilities for Minnesota Eating Behavior Survey (MEBS) scales in girls (intake and follow-up), mothers and fathers (intake), and girls with an eating disorder (intake)

MEBS scale	Younger cohort		Older cohort		Parents at intake		ED girls at intake (<i>n</i> =36–38)
	Age 11 (<i>n</i> =775–804)	Age 14 (<i>n</i> =664–689)	Age 17 (<i>n</i> =639–643)	Age 20 (<i>n</i> =619–628)	Mothers (<i>n</i> =717–735)	Fathers (<i>n</i> =646–650)	
<i>Total score</i>							
Mean (S.D.)	5.64 (4.86)	5.91 (5.69)	9.30 (6.15)	7.57 (5.80)	8.05 (5.37)	4.24 (4.01)	15.55 (6.86)
Alpha	0.86	0.87	0.89	0.89	0.87	0.84	0.91
<i>Body dissatisfaction</i>							
Mean (S.D.)	1.17 (1.71)	1.89 (2.09)	2.74 (2.24)	2.65 (2.29)	3.71 (2.21)	1.54 (1.69)	3.95 (2.10)
Alpha	0.83	0.85	0.85	0.87	0.85	0.77	0.82
<i>Binge eating</i>							
Mean (S.D.)	1.11 (1.41)	0.89 (1.34)	1.59 (1.57)	1.07 (1.40)	1.33 (1.64)	1.07 (1.28)	2.53 (2.55)
Alpha	0.69	0.68	0.65	0.68	0.75	0.65	0.73
<i>Compensatory behavior</i>							
Mean (S.D.)	0.09 (0.36)	0.24 (0.66)	0.52 (0.99)	0.33 (0.76)	0.19 (0.58)	0.07 (0.33)	1.53 (1.33)
Alpha	0.40	0.60	0.69	0.58	0.53	0.45	0.71
<i>Weight preoccupation</i>							
Mean (S.D.)	2.51 (2.24)	2.38 (2.47)	3.61 (2.51)	2.98 (2.47)	2.36 (2.27)	1.20 (1.58)	6.11 (2.28)
Alpha	0.78	0.85	0.81	0.82	0.80	0.71	0.79

ED: Eating disorder (probable or definite anorexia nervosa or bulimia nervosa).

year-old girls the least, although mothers had higher Body Dissatisfaction scores than 17-year-old girls. [Table 3](#) includes all MEBS items, the subscales they comprise, item endorsement frequencies for each cohort, and indicates which items are reverse-scored.

Intercorrelations of the MEBS total score and subscale scores appear in [Table 4](#). The Total Score and subscale scores were all significantly related to one another in each cohort. The Total Score tended to be substantially correlated with each subscale, especially with Body Dissatisfaction and Weight Preoccupation, subscales that focus on assessing dysfunctional beliefs, rather than behaviors, related to eating pathology. Subscale scores had weaker–yet still moderate–relationships with each other. This pattern of results suggests that subscales tap related but relatively distinct constructs within the domain of disordered eating attitudes and behaviors. Patterns of intercorrelations did not appear to vary substantially by cohort: mean correlations within cohorts were 0.51 (younger cohort, intake); 0.56 (younger cohort, follow-up); 0.60 (older cohort, intake); 0.55 (older cohort, follow-up); 0.49 (mothers); 0.51 (fathers); and 0.64 (girls with an eating disorder).

3.3. Internal consistency

Coefficient alphas for the Total Score and the Body Dissatisfaction and Weight Preoccupation subscales ranged from 0.71 to 0.85 across the different cohorts (see [Table 2](#)). Most Binge Eating alphas hovered around 0.70, whereas most Compensatory Behavior alphas were substantially lower ($\alpha=0.40$ –0.71). In general, few participants had endorsed items on these latter subscales, leading to a restricted

Table 3

Item endorsement frequencies for Minnesota Eating Behavior Survey scales in girls (intake and follow-up) and mothers, fathers, and girls with an eating disorder (intake) (in percent)

Item (subscale loading)	Age 11 (<i>n</i> =801–809)	Age 14 (<i>n</i> =686–691)	Age 17 (<i>n</i> =642–643)	Age 20 (<i>n</i> =626–630)	Mothers (<i>n</i> =733–739)	Fathers (<i>n</i> =648–661)	ED girls at intake (<i>n</i> =37–38)
1. I can eat sweets and starches (like potatoes, pasta and bread) without feeling upset or nervous. ^{a,b}	8.7	7.0	9.0	7.0	8.8	3.8	13.2
2. I often diet to control my weight. (WP)	13.7	15.6	25.8	24.9	23.7	9.5	52.6
3. My stomach is too big. (BD)	19.6	34.3	47.4	49.0	66.6	51.8	50.0
4. I eat when I'm upset about things. (BE)	13.7	21.7	37.2	35.7	45.0	19.7	42.1
5. I have thought about throwing up (vomiting) to lose weight. (CB)	2.1	11.9	22.2	12.9	3.4	1.8	50.0
6. Sometimes I stuff myself with food. (BE)	34.0	24.5	41.7	28.4	31.5	54.4	44.7
7. I think a lot about dieting (or losing weight). (WP)	27.8	35.2	51.6	49.4	44.3	20.3	71.1
8. My thighs are about the right size. ^a (BD)	15.4	35.3	46.2	48.1	64.4	14.4	55.3
9. Sometimes I completely stop eating for more than a day to control my weight. (CB)	4.0	6.7	13.5	6.7	4.7	2.7	34.2
10. I feel terribly guilty if I overeat. (WP)	28.8	28.7	42.3	35.1	26.2	9.2	65.8
11. I am really afraid of gaining weight. (WP)	31.5	35.0	57.9	48.9	30.1	11.6	84.2
12. The shape of my body is fine. ^a (BD)	18.0	25.9	42.0	35.2	62.0	37.5	73.7
13. Sometimes I use laxatives (like Ex-Lax or Correctol) to control my weight. (CB)	0.9	0.3	2.3	1.3	0.8	0.5	7.9
14. My weight is very important to me. (WP)	59.0	54.7	67.3	62.4	52.7	38.9	84.2
15. Sometimes I eat lots and lots of food and feel like I can't stop. (BE)	20.0	8.4	18.7	8.1	9.5	10.0	26.3
16. My butt (behind) is too big. (BD)	11.3	23.7	40.4	37.7	55.5	10.8	50.0
17. I sometimes use diet pills (like Dexatrim, Dietac or Acutrim) to control my weight. (CB)	0.4	2.0	8.2	8.3	7.2	1.8	21.1
18. I'm always wishing I was thinner. (BD)	35.9	38.6	57.5	54.9	56.6	20.5	76.3

19. I think a lot about overeating (eating a really large amount of food). (BE)	13.0	6.0	10.7	6.1	4.9	4.8	18.4
20. Sometimes I have a hard time telling if I'm hungry or not. ^b	45.5	30.2	47.6	30.8	23.4	15.5	73.7
21. I exercise to control my weight more than other women my age. ^b	23.6	16.2	27.6	16.7	15.1	16.3	36.8
22. My hips are just the right size. ^a (BD)	16.4	30.8	40.1	40.3	65.3	20.0	50.0
23. Sometimes, when I'm with other people, I won't eat much, but later, when I'm alone, I'll eat a lot. (BE)	19.6	14.8	28.6	10.7	16.2	8.6	31.6
24. I feel fat or stuffed even after eating a normal meal. (WP)	29.8	23.3	38.6	22.6	17.3	9.7	63.2
25. If I gain a pound, I worry that I will keep gaining more and more weight. (WP)	21.0	18.6	32.8	25.2	16.2	4.5	68.4
26. Sometimes I make myself throw up (vomit) to control my weight. (CB)	0.7	1.7	4.2	2.2	0.8	0.3	23.7
27. Sometimes I eat by myself so that others won't know what I'm eating. (BE)	5.8	4.6	11.4	6.4	12.2	5.4	26.3
28. When I get upset, I'm afraid that I will start eating. (BE)	5.0	8.3	11.2	11.3	14.0	4.3	34.2
29. I often weigh myself to see if I am gaining weight. (WP)	39.3	26.9	44.6	29.1	25.1	16.6	63.2
30. I sometimes use medicine that makes me lose water (diuretics like Sunril, Aqua-Ban, Pamprin, or Midol PMS) to control my weight. (CB)	0.6	0.9	1.1	1.4	1.4	0.0	5.3

ED: Eating disorder (consensus diagnosis made at probable or definite level of certainty); WP: Weight Preoccupation subscale; BD: Body Dissatisfaction subscale; BE: Binge Eating subscale; CB: Compensatory Behavior subscale.

^a item was reverse-scored prior to analysis.

^b item is not included on any subscale.

Table 4

Intercorrelations between Minnesota Eating Behavior Survey scales for girls (intake and follow-up) and for mothers, fathers, and girls with an eating disorder (intake)

	BD	CB	BE	WP
<i>Younger cohort, age 11 (n=797–801)</i>				
Total score	0.80	0.41	0.69	0.89
Body dissatisfaction (BD)	–	0.25	0.38	0.62
Compensatory behavior (CB)		–	0.23	0.33
Binge eating (BE)			–	0.45
Weight preoccupation (WP)				–
<i>Younger cohort, age 14 (n=689)</i>				
Total score	0.84	0.61	0.61	0.91
Body dissatisfaction (BD)	–	0.41	0.32	0.69
Compensatory behavior (CB)		–	0.31	0.52
Binge eating (BE)			–	0.41
Weight preoccupation (WP)				–
<i>Older cohort, age 17 (n=643)</i>				
Total score	0.82	0.67	0.66	0.88
Body dissatisfaction (BD)	–	0.43	0.39	0.63
Compensatory behavior (CB)		–	0.36	0.55
Binge eating (BE)			–	0.40
Weight preoccupation (WP)				–
<i>Older cohort, age 20 (n=628)</i>				
Total score	0.83	0.57	0.65	0.89
Body dissatisfaction (BD)	–	0.37	0.36	0.63
Compensatory behavior (CB)		–	0.29	0.46
Binge eating (BE)			–	0.43
Weight preoccupation (WP)				–
<i>Mothers (n=731–734)</i>				
Total score	0.77	0.42	0.74	0.84
Body dissatisfaction (BD)	–	0.16	0.41	0.47
Compensatory behavior (CB)		–	0.27	0.34
Binge eating (BE)			–	0.46
Weight preoccupation (WP)				–
<i>Fathers (n=650)</i>				
Total score	0.80	0.41	0.77	0.83
Body dissatisfaction (BD)	–	0.20	0.47	0.47
Compensatory behavior (CB)		–	0.24	0.35
Binge eating (BE)			–	0.51
Weight preoccupation (WP)				–
<i>Eating disorder girls, intake (n=38)</i>				
Total score	0.90	0.73	0.73	0.85
Body dissatisfaction (BD)	–	0.52	0.58	0.74
Compensatory behavior (CB)		–	0.44	0.44

Table 4 (continued)

	BD	CB	BE	WP
<i>Eating disorder girls, intake (n=38)</i>				
Binge eating (BE)			–	0.44
Weight preoccupation (WP)				–

All correlations statistically significant, $p < 0.01$.

range of scores, particularly for the Compensatory Behavior subscale. Mothers' alphas for the total score and subscale scores were similar to those of the 14-, 17-, and 20-year-old girls, whereas fathers' and 11-year-old girls' alphas tended to be lower. Alphas for girls with eating disorders were very similar to those found with the 17- and 20-year-old girls, the groups closest to them in age.

3.4. Test–retest reliability

Girls from the younger and older cohorts and mothers of the younger girls completed the MEBS at intake and again at follow-up. Three-year stability Pearson correlations for these three groups, as well as for the subset of girls diagnosed with an eating disorder, appear in Table 5.⁵ Correlations ranged from 0.18 to 0.80. Overall, among the large samples of girls and women, MEBS total scores were the most stable (mean (M)=0.67) and scales measuring attitudes (Body Dissatisfaction and Weight Preoccupation, M =0.63 (BD), 0.58 (WP)) were more stable than scales emphasizing behaviors (Compensatory Behavior and Binge Eating, M =0.33 (CB), 0.46 (BE)), and older participants' scores (mothers' r =0.39–0.80; M =0.66) were more stable than younger participants' scores (younger girls' r =0.21–0.59; M =0.43; older girls' r =0.39–0.61; M =0.51). Among girls with an eating disorder diagnosis, Body Dissatisfaction was the most stable scale. Three-year stability coefficients for the remaining three subscales (CB, BE, WP) were low and nonsignificant, suggesting a lack of stability in many eating disorder symptoms over time among girls with eating disorder diagnoses.

3.5. Concurrent validity

We assessed concurrent validity by examining correlations between MEBS scores and EDE-Q scores. These correlations appear in Table 6 for the participant groups that had completed both measures at the same assessment period. Although the MEBS and EDE-Q do not purport to measure precisely the same concepts, both questionnaires assess constructs related to disordered eating attitudes and behaviors, with the EDE-Q subscales emphasizing attitudes to a greater degree than behaviors. We hypothesized we would find highest correlations between the MEBS and EDE-Q total scores, as well as among the following sets of subscales, which measure similar constructs: MEBS Body Dissatisfaction and EDE-Q Weight Concerns and Shape Concerns subscales; MEBS Weight Preoccupation and EDE-Q Eating Concerns, Weight Concerns, and Shape Concerns, and, to a lesser degree, Restraint subscales; MEBS Binge Eating and EDE-Q Eating Concerns subscales; MEBS Compensatory Behavior and EDE-Q total score (as questions about purging on the EDE-Q are included only in a total score and not in any subscale).

⁵ Note that the stability estimates previously reported in Klump et al. (2000) were based on a small subsample of the samples presented here.

Table 5

Three-year stability correlations between intake and follow-up Minnesota Eating Behavior Survey (MEBS) scores for girls, mothers of 11 year-old girls, and girls with an eating disorder (ED)

MEBS scale	Younger cohort (<i>n</i> =639–643)	Older cohort (<i>n</i> =601)	Mothers (<i>n</i> =309–310)	ED girls (<i>n</i> =36)
Total score	0.59***	0.61***	0.80***	0.47**
Body dissatisfaction	0.53***	0.61***	0.75***	0.72***
Compensatory behavior	0.21***	0.40***	0.39***	0.18
Binge eating	0.32***	0.39***	0.68***	0.23
Weight preoccupation	0.51***	0.55***	0.69***	0.24

** $p < 0.01$.

*** $p < 0.001$.

Correlations ranged from 0.23 to 0.83 among the younger and older girls, and ranged from 0.37 to 0.74 in the subset of girls with eating disorder diagnoses. As predicted, MEBS total scores demonstrated the strongest correlation to EDE-Q total scores ($M=0.78$). Correlations among MEBS and EDE-Q scales that assessed similar constructs were moderate to high. The highest correlations tended to follow the predicted patterns, although in general the scales on each measure were significantly intercorrelated. For

Table 6

Correlations of Minnesota Eating Behavior Survey (MEBS) and Eating Disorders Examination Questionnaire (EDE-Q) scores in girls and girls with an eating disorder

MEBS scales	EDE-Q total score	Restraint	Eating concerns	Shape concerns	Weight concerns
<i>Younger cohort, age 14 (n=530–561)</i>					
MEBS total score	0.83***	0.67***	0.73***	0.85***	0.83***
Body dissatisfaction	0.72***	0.54***	0.74***	0.74***	0.74***
Compensatory behavior	0.51***	0.44***	0.44***	0.49***	0.48***
Binge eating	0.44***	0.30***	0.54***	0.42***	0.40***
Weight preoccupation	0.80***	0.67***	0.67***	0.79***	0.78***
<i>Older cohort, age 20 (n=465–487)</i>					
MEBS total score	0.78***	0.58***	0.73***	0.76***	0.76***
Body dissatisfaction	0.68***	0.45***	0.56***	0.70***	0.72***
Compensatory behavior	0.49***	0.40***	0.54***	0.46***	0.46***
Binge eating	0.41***	0.23***	0.54***	0.39***	0.37***
Weight preoccupation	0.72***	0.61***	0.62***	0.70***	0.68***
<i>ED girls, intake (n=25)</i>					
MEBS total score	0.74***	0.62**	0.71***	0.74***	0.70***
Body dissatisfaction	0.67***	0.51*	0.56**	0.71***	0.73***
Compensatory behavior	0.43*	0.37	0.43*	0.43*	0.40*
Binge eating	0.56**	0.51**	0.63**	0.53**	0.47*
Weight preoccupation	0.53**	0.43*	0.51*	0.55**	0.51*

ED: Eating disorder (probable or definite anorexia nervosa or bulimia nervosa).

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

the girls with eating disorders, correlations between MEBS and EDE-Q total and subscale scores tended to be similar to correlations involving the follow-up 14- and 20-year-old girls. Correlations were highest between the MEBS total score and EDE-Q total score and subscale scores ($r=0.74$ – 0.83), and lowest between the MEBS Binge Eating scale and all EDE-Q scales ($r=0.23$ – 0.63). Correlations were intermediate between the remaining MEBS subscales of Compensatory Behavior, Body Dissatisfaction, and Weight Preoccupation and the EDE-Q scales ($r=0.37$ – 0.79).

3.6. Criterion-related validity

We hypothesized that, in general, girls with eating disorders would report higher MEBS scores than comparison girls. An exception was our hypothesis that only girls with BN would have higher scores than controls on the Binge Eating subscale. Few AN girls reported any lifetime binge eating, whereas by definition anyone with BN has experienced a pattern of binge eating.

As Table 7 shows, girls with eating disorders tended to have higher MEBS scores than control girls. Not every subscale comparison was statistically significant, but effect sizes tended to be large, with the standardized mean difference, d , ranging from 0.63 to 1.99 for effects in which group differences were predicted. As expected, participants with AN reported levels of binge eating comparable to the control participants, even the subset of girls with AN who also reported in interviews that they had binge eaten ($n=5$). Low power due to small sample size probably played a role in the latter nonsignificant findings. Neither AN nor BN participants' Body Dissatisfaction scores differed significantly from those of control participants, despite the finding that means of AN and BN participants were between one-half and three-quarters of a standard deviation higher than control means. This difference was significant for the combined "any eating disorder" group, however.

Table 7

Mean differences (standard deviation) in Minnesota Eating Behavior Survey (MEBS) scores between girls with and without eating disorders

MEBS scales	AN			BN			Any eating disorder		
	Affected ($n=24$)	Unaffected ($n=24$)	$t(48) d^a$	Affected ($n=14$)	Unaffected ($n=14$)	$t(26) d^a$	Affected ($n=38$)	Unaffected ($n=38$)	$t(76) d^a$
Total score	13.42 (6.33)	7.29 (6.21)	3.35** 0.97	19.21 (6.33)	7.86 (5.95)	4.27*** 1.85	15.55 (6.86)	7.50 (6.04)	5.01*** 1.24
Body dissatisfaction	3.54 (2.06)	2.17 (2.32)	2.39 0.63	4.64 (2.06)	3.00 (2.32)	1.54 0.75	3.95 (2.10)	2.47 (2.32)	2.82** 0.67
Compensatory behavior	1.21 (1.18)	0.25 (0.53)	4.01*** 1.12	2.07 (1.44)	0.36 (0.63)	4.68*** 1.65	1.53 (1.33)	0.29 (0.57)	5.89*** 1.31
Binge eating	1.46 (1.82)	1.50 (2.04)	0.07 0.02	4.36 (2.65)	1.21 (1.67)	3.43** 1.46	2.53 (2.55)	1.40 (1.90)	1.86 0.51
Weight preoccupation	5.83 (2.60)	2.75 (2.38)	3.42** 1.24	6.57 (1.55)	2.78 (2.26)	4.51*** 1.99	6.11 (2.28)	2.76 (2.31)	5.19*** 1.46

AN: probable or definite anorexia nervosa; BN: probable or definite bulimia nervosa. The "Any Eating Disorder" category includes all girls in the AN and BN groups.

^a Standardized effect size.

** $p < 0.01$.

*** $p < 0.001$.

4. Discussion

The purpose of this study was to describe details of the development and psychometric properties of a self-report questionnaire in use by the MTFs that (a) provided a quantitative measure of attitudes and behaviors symptomatic of eating disorders, (b) was brief, and (c) could be used as readily with children as young as 10 years old as with adults. Previous factor analyses yielded four factors: Binge Eating, Body Dissatisfaction, Compensatory Behavior, and Weight Preoccupation (Klump et al., 2000). The initial four-factor solution was replicated in community samples of preadolescent and adolescent girls, women, and men, and psychometric analyses generally supported the reliability and validity of this scale with community-based individuals of a range of ages. Below we discuss in detail the major results of the present study.

4.1. Factor congruence

A four-factor structure was identified previously for the MEBS, based upon a subsample of the present 17-year-old cohort of girls (Klump et al., 2000). Overall, we found that this structure was generally congruent with that found with our large community samples of girls, mothers, and fathers, as all four factors showed moderate to high congruence. The Compensatory Behavior subscale showed the least congruence across samples, likely because of the heterogeneity of its items as well as their low rates of endorsement, although correlations were still moderate. Future research involving large samples of individuals with current eating disorders should assess the fit of the four-factor solution in clinical samples.

4.2. Reliability

We examined two types of reliability: internal consistency and test–retest reliability. The MEBS's scales generally demonstrated satisfactory internal consistency, particularly given the brevity of the measure and its subscales. The MEBS's internal consistency was comparable to that of EDI control respondents (Garner et al., 1983a, 1983b). Nunnally and Bernstein (1994) proposed a cut-off of 0.70 for determining acceptable reliability of scales, and coefficient alphas for the total score and the Body Dissatisfaction and Weight Preoccupation subscales met or exceeded that cut-off. However, the Binge Eating and Compensatory Behavior subscales were less internally consistent, likely for different reasons. The Compensatory Behavior subscale includes questions about four different methods of purging (e.g., self-induced vomiting, laxative use) as well as fasting, and so is more likely to involve heterogeneous responses than the other subscales. Individuals who induce vomiting do not also necessarily use diet pills or laxatives, and vice versa, so this subscale would not be expected to manifest substantial internal consistency. As noted earlier, the construct of binge eating is notoriously difficult to assess by self-report (e.g., Fairburn & Beglin, 1994), probably because of variability in individuals' definitions of binge eating. Our finding that this subscale was less internally consistent than others corresponds with previous findings. Additionally, the lower reliabilities of this subscale for fathers and 11-year-old girls may be due in part to decreased variability because of infrequent positive responses to pathological items, particularly Compensatory Behavior items, among these cohorts.

The MEBS manifested lower reliabilities with the youngest girls (aged about 11 years) and with men. Base rates of eating disorders tend to be low in both prepubescent children and adult males (American

Psychiatric Association, 2000), resulting in infrequent endorsement of pathological eating attitudes and behaviors in these groups.

Considering the substantial time lapse between assessments, the stability of this measure was very good. The MEBS total score three-year test–retest reliability for mothers (0.80) probably demonstrates best the psychometric stability of this instrument, given the developmental stability of these adults. As children progress through the age of risk, their susceptibility to triggers for developing an eating disorder may vary; as a result, we would not expect girls' three-year stability on this measure to be as high as adults'. These three-year stability statistics compare favorably to the one-year reliabilities from the EDI-2 (range=0.44–0.75) (Garner, 1991).

4.3. *Validity*

We assessed both concurrent and criterion-related validity. The MEBS's concurrent validity is supported by the moderate-to-high correlations between the MEBS's subscales and those of the EDE-Q. Similarly, its criterion-related validity is supported by higher MEBS subscale scores in girls with clinical eating disorders relative to an age-matched, non-eating disorder control group. These results are consistent with previous findings of significantly higher MEBS total scores in adolescent girls and women with vs. without lifetime eating disorder diagnoses (von Ranson, Iacono, & McGue, 2002). Further evidence for the validity of the MEBS's total score and subscale scores comes from previous research that identified significantly higher correlations between monozygotic than dizygotic 17-year-old female twins, suggesting clear genetic effects for the constructs tapped by this measure (Klump et al., 2000).

4.4. *Psychometrics of the MEBS among girls with eating disorders*

The reliability and validity of this measure has not yet been examined in clinical samples of individuals with eating disorders. Results from reliability and validity analyses comparing 39 girls with subthreshold or threshold AN or BN diagnoses and control girls revealed patterns that were analogous to analyses that had involved the entire sample. These results—from an admittedly small sample of girls with eating disorders—suggest that MEBS is a reliable and valid assessment tool for community-based individuals with eating disorders as well as those without. Note, however, that girls with and without AN or BN did not differ on Body Dissatisfaction subscale scores. This apparently anomalous finding may be due to the lower power of these analyses due to small sample sizes ($n=25$ AN girls; $n=14$ BN girls), as group differences were noted when the AN and BN groups were combined, yielding a larger sample size ($n=39$ eating disordered girls). Furthermore, effect sizes were 0.63 for the AN group and 0.75 for BN group, suggesting that eating disordered girls tended to experience more body dissatisfaction than non-eating disordered girls.

4.5. *Conclusions*

The present study included twins as well as their parents. The MEBS performed similarly well in reliability and correlational analyses in twins as in their singleton parents, suggesting this measure is useful with a wide range of ages, and with singletons as well as twins. This measure does not provide diagnoses of eating disorders, but instead assesses the severity of global eating-related pathology and

specific areas of difficulty (Body Dissatisfaction, Compensatory Behavior, Binge Eating, and Weight Preoccupation) via subscales. As a result, the MEBS may be useful in measuring longitudinal changes in these behaviors in nonclinical populations.

Several limitations of the present study should be noted. First, certain validity analyses were not completed with all cohorts at each time period, owing to limited assessment time during participants' MTFS visits. However, sufficient reliability and validity analyses were completed with samples at highest risk for manifesting an eating disorder (such as teenage and young adult girls) to support the conclusion that the MEBS is a useful measure. Second, our analyses of criterion-related validity included small numbers of participants, as this study included an epidemiological sample rather than a clinical or treatment-seeking sample, and so included relatively few eating disorder cases. This may have limited our ability to detect significant effects in these analyses. Third, as the MTFS is an epidemiological study, participants are representative of the population of a Midwestern American state. As study participants were largely Caucasian, caution must be used when interpreting scores of individuals of other ethnicities or from other countries. Fourth, the MEBS shares with other assessment measures the problem of being potentially influenced by response biases, such as reluctance to admit certain symptoms. Future research should assess the extent to which response biases are problematic in eating pathology studies.

In sum, the MEBS appears to have potential research and clinical utility in screening for and assessing a range of eating-related pathology in children and adults, with and without clinical eating disorders. Because of its brevity and the ease of administration, the MEBS may prove particularly useful in screening for disordered eating attitudes and behaviors among community-based individuals of varying ages.

Acknowledgments

The Minnesota Twin Family Study, an ongoing project conducted at the Department of Psychology of the University of Minnesota, is supported by grants from the National Institute on Alcohol Abuse and Alcoholism (AA 09367) and National Institute on Drug Abuse (DA 05147). Kristin von Ranson presented portions of earlier versions of this research at the 7th International Conference on Eating Disorders, New York, April 1996; the Eating Disorders Research Society, San Diego, CA, November 1999; and the 8th Biennial Meeting of the Society for Research on Adolescence, Chicago, IL; March 2000. We thank the twins and parents for their participation in the MTFS.

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