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Paper

The Rating of Anorexia and Bulimia (RAB) Interview: Development and Preliminary Validation

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Most interviews of eating disorders have been developed on homogeneous, English-speaking samples at particular academic institutions for research purposes, and tend to put scientific rigour before clinical utility. The present study deals with the development and preliminary validation of the Rating of Anorexia and Bulimia (RAB), a 56 item interview covering a wide range of eating disorder symptoms, related psychopathology and background variables, which can be used to generate operational DSM-IV diagnoses. Eating disorder variables on the RAB can be compiled into four subscales: Body-shape and Weight Preoccupation, Binge-Eating, Anorexic Eating Behaviour and Compensatory Behaviour. The instrument was investigated among 409 patients participating in the Swedish multi-centre study of eating disorders. Measures of internal consistency, diagnostic discrimination and correlations with the EDI-2 suggest that the RAB is a promising measure that reliably measures important aspects of eating disorder psychopathology.
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INTRODUCTION

Measures of eating disorders should be characterized by both clinical utility and empirical reliability. Established measures have, however, been largely

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centred on generating data for research purposes. Amongst the most widely used today are questionnaires such as the Eating Attitudes Test (EAT) (Garner and Garfinkel, 1979), the Eating Disorders Inventory-2 (EDI-2) (Garner *et al.*, 1983) and the Bulimic Investigatory Test (BITE) (Henderson and Freeman, 1987). Interview-based instruments include the Clinical Eating Disorders Rating Instrument (CEDRI) (Palmer *et al.*, 1987, 1996), the Eating Disorder Examination (EDE) (Cooper and Fairburn, 1987; Cooper *et al.*, 1989) and the Structured Interview for Anorexia and Bulimia (SIAB) (Fichter *et al.*, 1989, 1998).

Despite the clear advantages of many of these instruments in terms of demonstrated reliability and utility in clinical research, they also have a number of shortcomings. Certain aspects of eating disorders, such as binge-eating, body-image disturbance and weight phobia, may be difficult to assess with self-report measures. Measures such as the EDE fail to measure important psychosocial correlates that are of importance to both research and individual treatment planning as well as outcome evaluation. Clinically, interview assessments have been developed on relatively homogeneous patient samples at particular research institutions. It is thereby unclear to what extent such measures meet the everyday clinical needs of professionals working in divergent clinical settings.

Ideally, a satisfactory measure of eating disorders should be easy to use, relevant to the clinical needs of divergent treatment programmes and able to discriminate between different eating disorder diagnoses. It should also be able to measure concomitant psychopathology and background variables relevant to treatment planning. The present paper describes such an instrument, the Rating of Anorexia and Bulimia (RAB). The RAB was developed in conjunction with the Co-ordinated Evaluation and Research at Specialist Units for Eating Disorders in Sweden (CO-RED) Study. This longitudinal naturalistic study looks at eating disorder treatment at 15 specialist centres across Sweden. Participating centres offer a wide variety of treatment forms such as inpatient, day patient, outpatient individual psychotherapy, family and group therapy, psychoactive drugs, expressive forms of treatment using dance and art etc. A battery of self-report and interview-based measures is used to assess eating disorder and concomitant psychopathology at initial assessment, and subsequently after 6, 12, 18 and 36 months. The follow-ups conducted after 6 and 12 months are smaller in scale than those conducted 18 and 36 months after initial interview. CO-RED has been reviewed and approved by relevant ethics committees.

During the planning phase of CO-RED it was concluded that existing measures of eating disorders did not meet the needs of the project. It was deemed essential to utilize an instrument that would be relevant for both clinical and research needs. A semi-structured interview that could be easily administered and could assess essential information for diagnosis as well as

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treatment planning and outcome evaluation was seen as the most desirable instrument. Versions of the RAB were designed for use with both large- and small-scale follow-ups.

Having identified prospective items, they were then discussed in terms of their suitability as scaled items. The latter were then defined on a four-point scale (0–3). This procedure approximated the design of the CEDRI, which is also based on a four-point scale. Some of the RAB items were, however, defined on either a three- or five-point scale when this was judged to be desirable. Similar to the CEDRI, a rating of zero represented an absence of a pathological response, or a response that could be seen as relatively normal. The highest rating on each item was judged to be severe even for a sample of patients with eating disorders. Middle ratings were judged to be typical of clinical samples in either a mild or severe sense. Each item was given one or more appropriate open-ended questions to elicit responses, but it was not required of interviewers to rigidly stick to such formulations. Instead, interviewers were left free to choose a phrasing of the main and subsequent follow-up questions that suited the particular interview.

Thirty professionals from the various specialist units taking part in the national study evaluated a preliminary version of RAB using independent ratings of video-recorded interviews with five eating disorder patients. All the following criteria had to be met for an item to be judged acceptable: $>70\%$ of raters had to be completely in agreement, $>95\%$ of raters had to be in agreement within one scale interval and kappa must be $\geqslant 0.30$.

METHOD

Subjects

All patients who were a part of the data base of the CO-RED Study in May 1997, and who had been interviewed on the RAB, were investigated ($N = 409$). According to the method described below, based on clinical ratings of specific DSM-IV criteria, the distribution of diagnoses was found to be anorexia nervosa (AN) = 75, bulimia nervosa (BN) = 177, binge-eating disorder (BED) = 31 and eating disorder not otherwise specified (ED-NOS) = 126. Patients were classified as ED-NOS if they failed to meet criteria for AN, BN or BED but were being treated for an eating disorder at one of the participating specialist units. Furthermore, since diagnostic criteria for BED are still preliminary, and still formally a subgroup of ED-NOS, these patients were grouped together with the ED-NOS patients for the purposes of the study. All subjects had provided informed consent. Age ranged from 15 to 54 years ($M = 25.2$, $SD = 6.4$), and all participants were female with the exception of two males (one with BN and one with ED-NOS).

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Measures

The RAB Interview was used to assess eating disorder and related psychopathology. The RAB consists of 56 items covering a wide range of eating disorder, related psychopathology and background variables. Relevant eating disorder variables were compiled into four subscales: Body-Shape/Weight Preoccupation, Binge-Eating, Anorexic Eating Behaviour and Compensatory Behaviour. The Body-Shape/Weight Preoccupation and Anorexic Eating Behaviour subscales were combined to generate an Anorexia Index, while the Binge-Eating and Compensatory Behaviour subscales were combined to form a Bulimia Index. Other areas assessed include amongst other things impulse-related behaviour, sexual trauma, interpersonal relationships, heritability and treatment motivation. Social background variables, such as employment status, education, treatment history etc, are covered in a separate self-assesment instrument developed by the present authors, the Background and Treatment Questionnaire (BaT). An outline of the RAB, with grouping of items into subscales, is presented in Table 1. English versions of both the RAB interview and the BaT self-assessment instrument are available from the authors, and may be used and distributed free of charge, provided appropriate recognition is given.

Systematic assessment of DSM-IV diagnoses was made using a rating scale covering specific eating disorder diagnoses (AN, BN, BED and ED-NOS described above). For the AN, BN and BED diagnoses clinical raters working at the treatment centres were required to rate each specific DSM-IV criterion on a three-point scale (not present, not fully verified, fully verified). Only patients who had fully verified symptoms on all criteria were diagnosed as AN or BN. If a patient met criteria for both AN and BN she was classified as AN.

In order to compare the subscales of the RAB with a criterion measure the subscales of the Eating Disorder Inventory-2 (EDI-2) were used.

Procedure

Patients were assessed at initial interviews, prior to the commencement of treatment. Interviews were usually conducted by either a qualified psychiatrist or a clinical psychologist with experience in the assessment and treatment of eating disorders, although other professionals, such as experienced nurses and social workers, also took part. Formal training in making DSM diagnoses was uncommon, although clinicians were familiar with DSM criteria through clinical work and participation in the CO-RED study. Operational diagnoses of AN and BN using the RAB were defined as follows:

DSM-IV criteria	RAB items used for definition of *anorexia nervosa*
1	BMI < 18.
2	Very much afraid of gaining weight, or clear weight phobia.

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Table 1. Items included in the RAB

Scaled items used in RAB subscales:

- **Body-shape and weight preoccupation**
  - **Acceptability of present weight**
  - **Desire to lose weight**
  - **Fear of gaining weight**
  - **Acceptability of present shape**
  - **Weight preoccupation**
  - **Feeling fat**
  - **Feelings of disgust with body**
  - **Disturbed concentration**
  - **Importance of weight and shape for self-image**
  - **Ability to eat 'normal meals'**
  - **Body image**
  - **Weight phobia**
- *Binge-eating*
  - **Binge-eating: past and present (subjective evaluation)**
  - **Binge-eating: past and present (according to operational definition)**
- *Anorexic eating behavior*
  - **Restrained eating**
  - **Avoidance of 'fattening' foods**
  - **Subjective experience of 'fattening' foods**
- *Compensatory behaviour*
  - **Vomiting to reduce weight: past and present**
  - **Laxative use to reduce weight: past and present**
  - **Exercise to reduce weight: past and present**

Other scaled items not used in RAB subscales:

- **Length of symptom-free periods**
- **Present and past menstrual functioning**
- *Concomitant symptoms*
  - **Shoplifting food**
  - **Shoplifting other things**
  - **In debt due to binge-eating**
  - **Present and previous alcohol problems**
  - **Present and previous drug problems**
  - **Previous suicidal ideation and behaviour**
  - **Present suicidal ideation**
  - **Self-injury**
  - **Sexual trauma and violence (e.g. undesired sexual approaches, forced intercourse, incest or abuse)**
  - **Subjective image of parents' shape (highest and lowest weights)**
- *Relationships*
  - **Relationships with peers**
  - **Relationships with opposite sex**
  - **Frequency of conflicts with parents**
  - **Ability to resolve conflicts with parents**

Table 1 continued over page

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Table 1 continued

Treatment motivation
  Importance of treating problems for self, parents and significant others
  Acceptability of changing eating behaviour to get rid of problems

Open-ended/non-scaled items:
  Age and circumstances of onset
  Present weight and height; weight history and ideal weight
  Description of daily eating habits
  Onset of binge-eating
  Other means of reducing weight
  Other means of compensatory behaviour
  Familial constellation
  Heritability for eating disorders, psychiatric contacts, drug and alcohol problems, suicide attempts, diabetes

DSM-IV criteria	
3	Marked negative attitude towards own body, or weight and shape of considerable importance for self-esteem, or pathologically/extremely disturbed body image.
4	Amenorrhoea $\geqslant 3$ months. Patients regularly using birth control pills were classed as having amenorrhoea if BMI was less than 18.

DSM-IV criteria	RAB items used for definition of *bulimia nervosa*
1	Binge-eating at least 2 days/week during past 3 months. Binge-eating defined as during a limited period (e.g. 2 hours) eating an amount of food that is clearly considerably larger than that which most people would eat during the same period; the binge is accompanied by a feeling of loss of control over eating.
2	Compensatory behaviour in the form of frequent dieting or fasting, vomiting, use of laxatives or compulsive exercise.
3	Binge-eating and compensatory behaviour at least twice weekly.
4	Weight and shape of considerable importance for self-esteem, or disturbed body image, or clear weight phobia.
5	Not anorexic as defined above.

The average BMI of a normal female control group ($N = 108$) of comparable age (Sohlberg and Norring, 1989) was used as an estimate of expected weight (cf. Drewnowski and Garn, 1987). Cut-off was set to 18.0, i.e. 15.9% below the 21.4 BMI average among the controls.

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RESULTS

Internal consistency

The internal consistency of the RAB's subscales for eating disorder psychopathology was investigated by computing Cronbach's alpha: Body-Shape/Weight Preoccupation $\alpha = 0.88$; Anorexic Eating Behaviour $\alpha = 0.77$; Binge-Eating $\alpha = 0.93$; Compensatory Behaviour $\alpha = 0.61$; Anorexia Index $\alpha = 0.87$ and Bulimia Index $\alpha = 0.82$. With the exception of Compensatory Behaviour, subscales met the criteria of Nunnally and Durham (1975), who suggest that coefficients of internal consistency using Cronbach's alpha should approach 0.80.

Diagnostic discrimination

The question of the RAB's ability to discriminate diagnostically can be approached from two perspectives: agreement between operational RAB diagnoses and a criterion measure, on the one hand; and the ability to discriminate meaningful patterns within RAB diagnoses, on the other hand. When agreement between operational RAB diagnoses and a criterion measure was examined (in this case DSM-IV diagnoses made by clinical ratings of each of the specific DSM-IV criteria as described above) kappa was found to be moderate ($\kappa = .59$). Since kappa was less than satisfactory, a closer examination of mismatched cases was carried out. Of the 72 mismatched cases, the two most common reasons for lack of correspondence between RAB and DSM-IV diagnoses appeared to be unsystematic application of diagnostic criteria, and problems rating ambiguous DSM-IV criteria. For example, 22% of mismatches had been coded as ED-NOS on the RAB, and BN using DSM-IV ratings, although RAB ratings indicated that binge frequency was less than twice weekly. Similarly, 7% of mismatches had been classed as AN using the DSM-IV ratings, and ED-NOS using the RAB, although RAB ratings indicated that BMI was over 18. By far the largest group of mismatches (32%) had been classed as ED-NOS with the DSM-IV ratings and BN using the RAB. In these cases, there appeared to be some confusion among raters concerning specific DSM-IV criteria for BN. The most common DSM-IV criterion judged to be 'not fully verified' among these patients was criterion E (disorder not merely present during periods of AN). Criteria B and C (presence of compensation behaviour and frequency of binge-eating and compensation behaviour) also appeared to have caused problems.

When diagnostic examination using stepwise discriminant analysis was computed, more encouraging results were obtained. Using the four RAB subscales (Anorexic Eating Behaviour, Binge-Eating, Compensatory Behaviour and Body-Shape Preoccupation) as independent variables it was possible to predict DSM-IV diagnoses with two discriminant functions that could

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Table 2. One-way ANOVA for DSM-IV diagnoses by RAB subscales (M ± SD)

	AN	BN	ED-NOS	*F*	*p*
Anorexic Eating Behaviour	9.7 ± 2.5	7.6 ± 2.9	6.4 ± 3.4	22.2	.0001[1,2,3]
Binge-Eating	4.5 ± 5.5	12.1 ± 3.3	7.4 ± 5.2	69.3	.0001[1,2,3]
Compensatory Behaviour	6.7 ± 3.7	9.9 ± 3.7	5.9 ± 4.4	32.7	.0001[1,3]
Body-Shape Preoccupation	25.9 ± 8.0	28.5 ± 7.0	26.6 ± 8.9	3.0	.05
Bulimia Index	11.4 ± 8.6	22.1 ± 6.0	13.6 ± 7.7	63.7	.0001[1,3]
Anorexia Index	35.6 ± 10.0	36.3 ± 8.3	33.2 ± 10.4	3.0	.05

Scheffé tests: [1]$p < .05$ AN versus BN. [2]$p < .05$ AN versus ED-NOS. [3]$p < .05$ BN versus ED-NOS.

correctly classify 63.8% of cases ($\lambda = .56$, $p < .0001$). Using only the two RAB index variables (Anorexia Index, Bulimia Index) stepwise discriminant analysis resulted in a discriminant function that could correctly classify 59.9% of cases ($\lambda = .64$, $p < .0001$).

In order to investigate the ability of the RAB to discriminate meaningful patterns of differences within RAB diagnoses a series of one-way ANOVAs were conducted. DSM-IV ratings based on specific criteria were used as the independent variable, while RAB subscales functioned as dependent variables. When ANOVA was significant Scheffé tests were computed to examine specific pairwise differences. Results are summarized in Table 2.

Relationship between the RAB and the EDI-2

The validity of the RAB subscales can be investigated by examining correlations between subscales and a relevant criterion measure, in this case the EDI-2. Correlations were computed between the RAB and the EDI-2 subscales pertaining directly to eating disorder symptoms, and are presented in Table 3. Expected patterns of positive correlations emerged between Anorexic Eating Behaviour and Drive for Thinness, Binge-Eating and Bulimia, Compensatory Behaviour and Bulimia, and Body and Shape Preoccupation and Body Dissatisfaction, as well as the Bulimia Index and Bulimia and the Anorexia Index and both Drive for Thinness and Body Dissatisfaction.

Table 3. Correlations (Pearson's *r*) between RAB subscales and EDI-2

	Drive for thinness	Bulimia	Body dissatisfaction
Anorexic Eating Behaviour	.32**	−.08	.07
Binge-Eating	.25**	.71**	.11*
Compensatory Behaviour	.34**	.41**	.07
Body and Shape Preoccupation	.61**	.28**	.59**
Bulimia Index	.32**	.67**	.13*
Anorexia index	.61**	.19**	.53**

*$p < .05$. **$p < .01$.

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DISCUSSION

The present paper deals with the development and preliminary validation of the Rating of Anorexia and Bulimia (RAB) Interview, a semi-structured interview for collecting information relevant to both clinical work and research in the field of eating disorders. The instrument may be used and distributed free of charge. Compared to other interview measures of eating disorders the RAB is most similar to the CEDRI, although the RAB has the advantage of generating operational DSM-IV diagnoses; individual items can also be used to compare subscales relevant to eating disorder psychopathology. Psychometrically, the most promising aspects of the interview concerned the internal consistency of the RAB subscales and correlations between RAB subscales and the EDI-2 when used as a criterion measure. With the exception of Compensatory Behaviour, internal consistencies (alpha) were within clearly acceptable levels. Body-Shape/Weight Preoccupation as well as Binge-Eating appeared especially promising. Correlations with the EDI-2 suggest that RAB subscales have a considerable degree of covariation with corresponding variables, and that the RAB measures important aspects of eating disorder psychopathology.

Most problematic, however, were results pertaining to diagnostic discrimination. Agreement between operational DSM-IV diagnoses based on specific RAB items and independent diagnoses made at participating units was mediocre. Although these findings could be due to a need to better formulate particular RAB items used for operational diagnosis, they may reflect a paucity of formalized training in making DSM-IV diagnoses at the participating units. Closer examination of mismatched cases suggested that raters applied DSM-IV criteria unsystematically (e.g. frequency of binge eating for BN, weight levels for AN), and that they may have had problems with certain DSM-IV criteria that can be experienced as ambiguous. Considering the fact that the units involved were in the first place clinical institutions, rather than research units, this may not be surprising. It may be that reliable diagnoses are more readily obtained through the administration of interviews, such as the RAB, that require the rating of specific well defined items, than through ratings of DSM-IV criteria that are less clearly anchored in clinical material.

No formal training in the use of the RAB is deemed necessary for clinicians considering using the RAB. However, such persons should have a good familiarity with eating disorders. It may also prove useful for a clinical team to conduct some test interviews and discuss results before introducing the RAB to clinical practice in order to develop a common approach to the rating of individual items.

Finally, although the present results are encouraging, there is also a need for continued research and development of the RAB. It will be important to improve the internal consistency of the Compensatory Behaviour subscale, perhaps through the inclusion of additional relevant items such as chewing

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and spitting food, use of diet pills etc. It will also be essential to examine sensitivity to change over time and the question of interrater reliability. Most importantly, it will be necessary to examine the question of differential diagnosis more closely. A separate paper pertaining to this question is planned for the near future. Nevertheless, the RAB in its present form is arguably both sufficiently clinically relevant and empirically well founded to warrant its use in both applied settings and research.

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