Electronic Delivery Cover Sheet

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Anorexia Nervosa 6 Years After Onset: Part I. Personality Disorders

I. Carina Gillberg, Maria Råstam, and Christopher Gillberg

Fifty-one adolescent-onset anorexia nervosa (AN) cases recruited after community screening were compared with 51 age-, sex-, and school-matched cases with regard to personality disorders and autism-spectrum disorders (ASD)/empathy disorders at age 21 years. All 102 cases had originally been examined at a mean age of 16 years, slightly over a year after the reported onset of the eating disorder. Structured Clinical Interview for DSM-III-R (SCID) interviews were performed by a psychiatrist blind to the original eating disorder diagnosis. Most of the former AN cases were recovered with respect to weight, but the outcome in social areas was restricted. Personality disorders coded on axis II in the DSM-III-R and empathy disorders were much more common in the AN group than in the comparison (COMP) group. Obsessive-compulsive (OCD) and avoidant personality disorders were particularly common. Obsessive-compulsive behaviors showed a high degree of stability over time and were unrelated to weight problems. Together with empathy disorder, they tended to predict outcome better than the eating disorder as such. It is concluded that in some cases, AN may be seen to reflect but one axis I diagnosis occurring in the life of an individual with a chronic personality disorder.

Anorexia Nervosa (AN) is a common eating disorder, usually with adolescent onset, affecting more than 1% of females and 0.1% of males under the age of 18 years.1,2 There is considerable evidence that premorbid constitutional/personality factors may play an important role in the pathogenesis of the disorder or at least in the expression of symptoms associated with the eating disorder.2-6 There is also an expanding literature on the comorbidity patterns of AN, particularly relating to other eating, affective, and anxiety disorders.7-9 It is clear that AN sometimes develops into bulimia nervosa. A very high rate of comorbid depression in AN has also been repeatedly demonstrated.10,11

It has been reasonably well established that certain personality traits are overrepresented in AN populations. Dally5 drew attention to the high prevalence of obsessions and compulsions in the AN population. However, it is only recently that operationalized criteria12,13 and structured instruments for diagnosing personality disorders—e.g., the Personality Disorder Examination (PDE)16 and the Structured Clinical Interview for DSM-III-R (SCID)15—have appeared. The personality disorders grouped in cluster C of the DSM-III-R—avoidant, dependent, obsessive-compulsive (OCD), and passive-aggressive—were found to be exceptionally common in a study by Halmi et al.,9 in which the PDE was used. No non-eating-disordered group was included for comparison, and the interviewers were not blind as to the presence of the eating disorder. However, three quarters of the eating disorder sample were reevaluated approximately 3 months after the initial assessment by raters blind to the results obtained at the original study, and the overall rate with which personality disorders were diagnosed remained essentially unchanged. Avoidant personality disorder, diagnosed after SCID interview, was also more common in the clinically referred AN group than in a control group in the study by Casper.5 Råstam6 reported that DSM-III-R OCD occurred in 29% of AN cases drawn from the general population, as compared with 4% of non-AN comparison cases matched for age, sex, and school. Diagnoses were made by a rater blind to the eating disorder status on the basis of case notes prepared from structured interviews covering personality variables and personality disorders. Gillberg and Råstam16 further suggested that a subgroup of cases with AN might have underlying autistic-like conditions with severe restrictions of social interaction, communication, and imagination, behavior, and interest patterns.

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It has been suggested that one reason for the strong AN concordance across monozygotic twin pairs as compared with dizygotic twin pairs could be an inherited personality type (e.g., OCD) that predisposes to the ritualistic behavior and insistence on routine and same-ness associated with restricting eating disorders of the AN type.

The present study sets out to analyze (1) the prevalence of DSM-III-R personality disorders in a representative group of adolescent-onset AN cases; (2) the stability of personality disorders over a 6-year period after reported AN onset; (3) the contribution of operationally defined empathy disorders and autism-spectrum disorders (ASD) to AN and the overlap of such disorders with some of the personality disorders; and finally, (4) the interaction between axis II (personality disorder) and axis I (current psychiatric syndrome) diagnoses. The companion report (part II) analyzes the comorbidity patterns as reflected in DSM-III-R axis I diagnoses.

METHOD

Material

Twenty-three females (including one case ascertained as meeting criteria for DSM-III-R AN who refused participation in the postscreening neuropsychiatric part of the study) and two males constituted the total population of individuals born in 1970 and developing AN under the age of 18 years. Details of the epidemiological study have been published previously. In the first report, reference is made only to 20 cases diagnosed under age 16 years, but the population was later evaluated to age 18 years and five further cases had onset at age 16 or 17 years. Our findings correspond to a population prevalence of AN in those aged 17 years and under of 1.08% for females and 0.09% for males and a population-corrected female to male ratio of 11.6:1. The Göteborg study of AN is the only clear population study—comprising a reasonable number of cases—in the field. Because every single teenager was examined without his/her clothes on, had his/her growth chart scrutinized in detail, and was evaluated for more than 1 year by the same school nurse, and because 99.7% of the whole population completed an AN screening questionnaire, we believe that we have not missed AN cases in this population.

The population group (22 females and two males plus the female who refused in-depth study) was contrasted with another population screening sample of AN cases (26 females and one male) who were reported to the research team by school health nurses and doctors, pediatricians, and child psychiatrists during the follow-up period for the original population group. This sample was less comprehensive than the original one, but it was not a clinically referred group. In fact, more than one third of this group did not consult medical or psychiatric services for the eating disorder. We have estimated that the latter sample comprises approximately 60% of all AN cases in their birth cohort.

All 51 AN cases in this study met DSM-III-R criteria for the disorder. Forty-eight of these met or had met such criteria already at the first diagnostic study, but three were classified as partial at that time. However, these three cases later met full DSM-III-R criteria. The groups will be referred to as (1) AN total-1 (the 17 females, excluding the one who refused participation in the neuropsychiatric study, and two males in the first population group who had onset of AN before age 16 years), (2) AN total-2 (the five females belonging to the first population group who had onset of AN at age 16 or 17 years), and (3) AN screen (the 26 females and one male with teenage-onset AN that were reported during the follow-up period for groups 1 and 2). This group was similar with regard to illness duration and age of onset to groups 1 and 2. However, more cases were reported to be in contact with treatment facilities in this subgroup. This is not surprising, given that interest in treatment increased and intensive efforts at referring for treatment increased during the follow-up period for the original population group as a direct consequence of the research project as such. The collapsed AN total-1 and AN total-2 groups will be referred to as the AN total group. The AN total and AN screen groups will often be pooled as the AN group in this report because they have been compared with regard to several hundred background measures (relating to aspects of development, personality, physical illness, family situation, family interaction, etc.) and found to be similar in virtually all aspects other than treatment received. The AN total-1 group was referred to as the AN-P group and the collapsed AN total-2 and AN screen group as the AN-M group in a previous publication analyzing the premorbid personality disorder pattern in the present samples.

The AN group will be compared throughout with a sex-, age-, and school-matched group of 51 cases recruited at the time of the original diagnostic study, referred to as the COMP group. There were no dropouts from the follow-up study, and all 102 individuals assigned for study were seen personally and examined in accordance with the procedure described below.

Age of Onset

The mean age of AN onset was 14.3 years (95% confidence interval, 13.9 to 14.7).

Age at First Examination

The mean age at first examination was 16.1 years (95% confidence interval, 15.7 to 16.5) in the AN total group, 16.0 years (95% confidence interval, 15.5 to 16.5) in the AN screen group, and 16.0 years (95% confidence interval, 15.5 to 16.5) in the COMP group.

Age at Follow-up Study

The mean age at follow-up examination was 21.0 years (95% confidence interval, 20.5 to 21.4) in the AN group and 20.8 years (95% confidence interval, 20.3 to 21.3) in the
COMP group. The AN total and AN screen groups had almost identical means and confidence intervals.

**Follow-up Period**

The average elapsed time from the onset of AN to the time of the follow-up study was 6.7 years (95% confidence interval, 6.3 to 7.0). The average time elapsed from the first examination to the time of the follow-up study was 4.9 years (95% confidence interval, 4.7 to 5.2) in the AN group and 4.6 years (95% confidence interval, 4.3 to 4.9) in the COMP group. The AN total group had been evaluated for a slightly longer period than the AN screen group.

**Methods**

The individuals (AN and COMP) were seen at the time of diagnosis of AN (at a mean age of 16 years) by a psychiatrist (M.R.) who interviewed them and their mothers in depth concerning family situation, early development, temperament, personality, physical and mental symptoms, and the extent to which the family/child had availed themselves of services (for AN and other problems/disabilities). The instruments used have already been reported.8,19

Individuals with AN and those in the COMP group were evaluated later (at a mean age of 21 years) by another psychiatrist and psychologist (I.C.G.) blind to the original group status. The majority of AN cases were then no longer emaciated, and it was not possible for the psychiatrist/psychologist to determine which original diagnostic group they belonged to. Furthermore, the individuals were specifically instructed by the receptionist nurse not to mention anything about whether she/he had suffered from an eating disorder. This psychiatrist performed the SCID-II15 to elicit information to make appropriate personality disorder diagnoses. She also made an overall judgment as to each individual’s capacity for empathizing with the perspectives, thoughts, and feelings of others. She administered the Dewey Social Awareness Test20 and examined all individuals neurodevelopmentally/neurologically. She also administered the Wechsler Adult Intelligence Scale-Revised21 and requested some information relating to overall functioning.

All individuals were also again examined by the psychiatrist who had performed the diagnostic study (M.R.). She used the SCID-I15 to elicit information to make appropriate axis I diagnoses according to the DSM-III-R. She also interviewed the young adults, using the Morgan-Russell AN outcome scales (as revised by Morgan and Hayward22). She too made a rating of empathic skills as reflected during interview corresponding to the rating made by the other psychiatrist/psychologist (I.C.G.). Finally, she weighed all the individuals in the study. Height was reported by the individuals themselves at interview.

At the end of the interviews, DSM-III-R diagnoses were made independently by the two psychiatrists (axis I by M.R. and axis II by I.C.G.). I.C.G. also checked the diagnostic criteria for Asperger’s syndrome as outlined in the study by Gillberg and Gillberg23 and elaborated in the study by Gillberg.24 These criteria have been shown to have good interrater reliability.23 She also checked the autistic disorder criteria of the DSM-III-R. When six to seven of the required eight necessary criteria (of 16 possible) for autistic disorder were met, a diagnosis of other autistic-like condition was made. ASD was the blanket term used when either Asperger’s syndrome criteria or criteria for other autistic-like conditions were met.

After the data collection was finished and the diagnoses according to axis I and axis II had been made, the two psychiatrists met to make a conjoint diagnosis of “empathy disorder” on the basis of all information and observation data obtained by both of them in connection with interview. The psychiatrist who had been blind to original group status (I.C.G.) remained blind throughout this procedure. Empathy deficits were rated on a five-point scale: 0, no problems; 0.5, possibly mild problems; 1.0, mild problems; 1.5, possibly severe problems; and 2.0, severe problems. A diagnosis of empathy disorder was made in individuals who were assigned a score of 2.0 and who, during interview, had professed that they had a problem understanding other people’s perspectives, thoughts, and feelings and felt socially inept themselves related in a nonreciprocal fashion with the examiner. Interrater reliability for empathy disorder thus diagnosed is good if psychiatrists have worked together for at least 2 months and have been using this concept in their diagnostic work up of patients. In a preliminary study including 20 individuals in the 20- to 50-year-old age range, five of whom had Asperger’s syndrome24 and the remaining 15 of whom were a sample from the normal population, three psychiatrists showed complete agreement in 60%, a difference across all three raters of 0.5 in 15%, and a difference across all three raters of 1.0 in 25%. At least two of the three psychiatrists agreed completely in 90% of the cases.25

**Outcome Categories**

Three different outcome classification devices were used: (1) Recovered—not recovered, according to the individual who had been diagnosed as AN in teenage years (interview data and included in the Morgan-Russell interview); (2) Averaged scale scores according to the Morgan-Russell interview, an averaged composite score summarizing outcome data on body weight, diet restriction, menstruation, attitude about sex and menstruation, social relationships, relationships with family, and mental state, with a possible range of 0 to 12 (12 indicates normal results in all areas); and (3) Good—intermediate and poor outcome, a general outcome classification as used by Ratnasuriya et al.20 In this classification, good outcome equals normal body weight (100% ± 15% average body weight), intermediate outcome equals normal or near-normal weight and/or menstrual abnormalities, and poor outcome equals low weight and absent or scanty menstruation.

Some of the outcome data are published in separate reports. Thus, the Morgan-Russell scale data are presented in one report,27 the physical and health aspects in another,28 and the psychological/achievement aspects in a third report in progress. The present study deals mainly with personality disorders and ASD at age 21 years. The companion report details the results pertaining to axis I diagnoses.29

**Statistical Methods**

Chi-square tests for matched pairs were used in statistical analyses of results.
RESULTS

Overall Outcome

Fifty-three percent of the AN group were not recovered from AN according to their own opinion. However, of these, almost three-quarters considered themselves improved. The overlap between perceived outcome and outcome as documented by Morgan-Russell scale scores and the presence/absence of axis I/axis II SCID diagnosis was relatively good, but in some instances very far from perfect. Thus, one female who did not admit to any severe axis I or axis II problems had the poorest outcome of all according to the average Morgan-Russell score. Conversely, a female who considered herself recovered was diagnosed as suffering from empathy disorder and OCD. Detailed results of overall outcome are reported separately.

Personality Disorders (SCID axis II)

The rate at which axis II diagnoses were assigned is summarized in Table 1. Forty-one percent of the individuals with AN met criteria for at least one axis II diagnosis, as compared with 18% in the COMP group (P < .02). Twenty-four percent of AN and 2% of COMP cases met criteria for two or more diagnoses (P < .01). Six individuals (12%) in the AN group met criteria for three or more diagnoses, as compared with none in the COMP group (P < .05).

Cluster C personality disorders were by far the most common. Altogether, 49 axis II diagnoses were assigned in the group of 102 individuals; of these, cluster C accounted for 33, and 28 of these belonged in the AN group. There was considerable overlap of axis II diagnoses within the AN group; thus, 19 individuals (37%) in this group had at least one cluster C diagnosis, as compared with 10% in the COMP group (P < .001). OCD was the most common cluster C diagnosis, and it was significantly more prevalent in the AN group. Avoidant personality disorder was also quite common, but the difference as compared with the COMP group did not reach statistical significance.

Table 1. Personality Disorders at a Mean Age of 21 Years in AN (at a mean of 6 years after onset) and COMP Cases

<table>
<thead>
<tr>
<th>Personality Disorder</th>
<th>AN (n = 51)</th>
<th>COMP (n = 51)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cluster A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paranoid</td>
<td>3 (6%)</td>
<td>1 (2%)</td>
<td>NS</td>
</tr>
<tr>
<td>Schizoid</td>
<td>0</td>
<td>0</td>
<td>NS</td>
</tr>
<tr>
<td>Schizotypal</td>
<td>1 (2%)</td>
<td>0</td>
<td>NS</td>
</tr>
<tr>
<td>Any cluster A</td>
<td>3 (6%)</td>
<td>1 (2%)</td>
<td>NS</td>
</tr>
<tr>
<td>Cluster B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antisocial</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Borderline</td>
<td>3 (6%)</td>
<td>0</td>
<td>NS</td>
</tr>
<tr>
<td>Histrionic</td>
<td>0</td>
<td>2 (4%)</td>
<td>NS</td>
</tr>
<tr>
<td>Narcissistic</td>
<td>4 (8%)</td>
<td>1 (2%)</td>
<td>NS</td>
</tr>
<tr>
<td>Any cluster B</td>
<td>7 (14%)</td>
<td>3 (6%)</td>
<td>NS</td>
</tr>
<tr>
<td>Cluster C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avoidant</td>
<td>7 (14%)</td>
<td>1 (2%)</td>
<td>&lt;.07</td>
</tr>
<tr>
<td>Dependent</td>
<td>4 (8%)</td>
<td>0</td>
<td>NS</td>
</tr>
<tr>
<td>Obsessive-compulsive</td>
<td>15 (29.5%)*</td>
<td>3 (6%)†</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Passive-aggressive</td>
<td>2 (4%)</td>
<td>1 (2%)</td>
<td>NS</td>
</tr>
<tr>
<td>Any cluster C</td>
<td>19 (37%)</td>
<td>5 (10%)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-defeating</td>
<td>0</td>
<td>1 (2%)</td>
<td>NS</td>
</tr>
<tr>
<td>Any SCID personality disorder</td>
<td>21 (41%)</td>
<td>9 (18%)</td>
<td>&lt;.02</td>
</tr>
<tr>
<td>Two or more SCID personality disorders</td>
<td>12 (23.5%)</td>
<td>1 (2%)</td>
<td>&lt;.01</td>
</tr>
</tbody>
</table>

NOTE. Results are presented as n (%).
*including three cases meeting clinical but not full research criteria according to SCID-II interview.
†including one case meeting clinical but not full research criteria according to SCID-II interview.

ASD and Empathy Disorders

ASD and empathy disorders are not accepted axis II diagnoses. However, they both represent disorders with a relatively static symptomatology and a stable course, which is well in accordance with personality disorders. Table 2 details the findings with respect to ASD (and their overlap with cluster C diagnoses) and empathy disorders. Fifteen individuals (almost 30%) in the AN group had an empathy disorder (as compared with 4% in the COMP group, P < .01). Several of these AN empathy disorder cases (five females, one male) met criteria for Asperger's syndrome, and a few more (four females) were diagnosed as suffering from autistic-like conditions. A male with Asperger's syndrome and a female with an autistic-like condition were also diagnosed as suffering from OCD. A female with Asperger's syndrome was also diagnosed with OCD and paranoid and narcissistic personality disorder. A female with an autistic-like condition also received diag-
PERSONALITY DISORDERS OF ANOREXIA NERVOSA

Table 2. ASD, Personality Disorders Involving Severe Problems of Reciprocal Social Interaction (cluster C), and Empathy Disorders

<table>
<thead>
<tr>
<th>Type of Problem</th>
<th>AN (n = 51)</th>
<th>COMP (n = 51)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asperger’s syndrome</td>
<td>6 (12%)*</td>
<td>0</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Other autistic-like conditions</td>
<td>4 (8%)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Any autistic-like condition</td>
<td>10 (20%)</td>
<td>0</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Any cluster C personality disorder or ASD</td>
<td>25 (37%)</td>
<td>5 (10%)</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Empathy disorder</td>
<td>15 (29.5%)</td>
<td>2 (4%)</td>
<td>&lt;.002</td>
</tr>
</tbody>
</table>

NOTE. Results are presented as n (%).

*Including two cases meeting five of the six criteria for Asperger’s syndrome according to the elaborated criteria specified,24 Meeting ICD-10 criteria31 for Asperger’s syndrome in all cases (except that it is usually impossible to ascertain that the language development accorded exactly with that described in the ICD-10).

nPossesses of avoidant, paranoid, and schizotypal personality disorders. Another female with an autistic-like condition also received diagnoses of paranoid and narcissistic personality disorder. The remaining four females with Asperger’s syndrome and the one with an autistic-like condition were not assigned SCID-II axis II diagnoses.

Four of the 15 individuals with empathy disorder in the AN group received no other diagnosis. However, two of the four were in the bottom five with regard to outcome according to Morgan-Russell average scores.

Thirty-seven percent of the AN group had either a cluster C personality disorder diagnosis or a diagnosis of ASD, as compared with 10% of the individuals in the COMP group (P < .0001).

Changes Over Time With Respect to Obsessive-Compulsive Symptoms and ASD

Almost exactly as many individuals in the AN and COMP groups showed either obsessive-compulsive symptoms, OCD, ASD, or any combination of these at follow-up evaluation as had at the original study at age 16 years (Table 3). More than three quarters who showed obsessive-compulsive symptoms, OCD, or ASD at any of the two ages did so at both ages (P < .01). Both OCD and ASD were diagnosed by raters blind to AN/CMP group status at both ages.

Table 3. Development of Obsessive-Compulsive Problems and ASD From Age 16 to 21 Years

<table>
<thead>
<tr>
<th>Problem</th>
<th>AN (n = 51)</th>
<th>COMP (n = 51)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any OCD/OCPD/AS/ALC at age 16</td>
<td>30</td>
<td>5</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Any OCD/OCPD/AS/ALC at age 21</td>
<td>30</td>
<td>6</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>OCD/OCPD/AS/ALC at both ages</td>
<td>23</td>
<td>5</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>OCD/AS/ALC at both age 16 and 21</td>
<td>14</td>
<td>2</td>
<td>&lt;.02</td>
</tr>
</tbody>
</table>

Abbreviations: OCD, obsessive-compulsive disorder; OCPD, obsessive-compulsive personality disorder; AS, Asperger syndrome; ALC, autistic-like condition.

Of the six individuals diagnosed with Asperger’s syndrome at age 21 years, only the male had been diagnosed with this condition already at the time of the original study. Two of the five females with Asperger’s syndrome at follow-up evaluation had been diagnosed as suffering from an autistic-like condition in the diagnostic study at age 16 years. Two further females with autistic-like conditions at the time of the first study again received this diagnosis at age 21 years. The three “new” cases of Asperger’s syndrome at follow-up evaluation had received diagnoses of OCD (n = 2) and “identity disorder” (n = 1) at age 16 years. The two new cases with autistic-like conditions had been diagnosed as suffering from OCD and Tourette’s syndrome, respectively, in the diagnostic study at age 16 years. (It merits mention here that all diagnoses pertaining to ASD and personality disorders were made by two independent assessors, and that both of these were blind with regard to original group status and diagnostic assessments made by previous investigators.)

Overlap of Axis II and Axis I Diagnoses

The presence of an axis II diagnosis tended to better predict an axis I diagnosis than vice versa, at least in the AN group, where 21 of the 26 with an axis II diagnosis also had an axis I diagnosis (Table 4). In the group of 12 AN individuals

Table 4. Concurrence of Axis I and Axis II (including ASD) Diagnoses at Age 21 Years

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>AN (n = 51)</th>
<th>COMP (n = 51)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>No axis II/ASD—no axis I</td>
<td>13 (25.5%)</td>
<td>36 (70%)</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>No axis II/ASD—at least 1 axis I</td>
<td>12 (23.5%)</td>
<td>6 (12%)</td>
<td>NS</td>
</tr>
<tr>
<td>At least 1 axis II/ASD—at least 1 axis I</td>
<td>21 (31%)</td>
<td>6 (12%)</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>At least 1 axis II/ASD—no axis I</td>
<td>5 (10%)</td>
<td>3 (6%)</td>
<td>NS</td>
</tr>
</tbody>
</table>

NOTE. Results are presented as n (%).
with no axis II but at least one axis I diagnosis, six met many but not all diagnostic criteria for OCD.

**AN Total-1, AN Total-2, and AN Screen Groups Compared**

The rate of axis II diagnoses according to SCID-II interview was 42% in the collapsed AN total-1 (37%, n = 19) and AN total-2 (60%, n = 5) groups. The corresponding rate in the AN screen group was 41% (n = 27). Thus, with respect to personality disorder diagnoses, the two groups were clearly comparable. However, there tended to be slightly more ASD without concomitant SCID-II personality disorder diagnosed in the AN screen group (n = 4) than in the AN total-1 plus AN total-2 (n = 1), but the numbers were too small for meaningful statistical analysis of the possible difference. Also, empathy disorder (comprising the ASD category) was equally common in the AN total-1 plus AN total-2 group and the AN screen group (29% and 30%, respectively), indicating that the tendency toward more ASD in the AN screen group might be a chance finding anyway.

**DISCUSSION**

The results of this investigation demonstrate that, unlike a carefully matched, non-eating-disordered population, young adults who had AN in adolescence often have cluster C personality disorders (particularly OCD and avoidant personality disorder) and empathy disorders.

The present study, to our knowledge, is the first to assess the rate of personality disorders in the follow-up evaluation of AN in a community sample. Our own previous study in the field, on the same sample, referred to DSM-III-R personality disorders at age 16 years (despite the fact that the DSM-III-R presupposes an age of at least 18 years, or “early adulthood,” in the individual receiving a personality disorder diagnosis). All other previous studies have referred to clinic-based samples, mostly on considerably older groups.

There was no attrition in the follow-up study. The eating-disordered group was no longer physically apparently deviant (except in three cases). The AN and COMP groups were assessed with a standardized and reliable personality disorder instrument by one and the same rater completely blind to group status. These facts, taken with the community-based character of the eating disorder sample, should vouch for the representativeness and validity of the findings. Nevertheless, the relatively small number of cases included (in particular when the samples were broken down into subgroups) calls for considerable caution in the interpretation of the results obtained. Also, some of the instruments used (such as the SCID-II) have not been tested for reliability specifically in a young adult Swedish population. However, even though theoretically this might mean that another interviewer could have found different rates of personality disorder generally, the difference between the AN and COMP groups should be valid.

Interestingly, as many as 18% of the non-eating-disordered group from the general population received a personality disorder diagnosis in our study. This is slightly lower than in the diagnostic study at a mean age of 16 years, when 27% of the non-eating-disordered group (the same as in the present study) were diagnosed with a personality disorder. It is possible that adolescence in itself contributes to a somewhat higher rate of diagnosed personality disorder in the teenage period than in early adulthood. However, there is also the possibility that the SCID interview at age 21 years may have been more conservative in its estimate of personality disorder than the interview performed at age 16 years. Another possible explanation for the discrepancy is that the personality disorder diagnosis at age 16 years was based on information covering the individual’s habitual behavior pattern and personal style from the premorbid period (as recollected by the informant, usually the mother), whereas the SCID diagnosis was based on information (from the proband) about habitual behavior patterns as perceived in the current situation. Finally, the result may also be an effect of two different raters having two different sets of clinical judgments despite checking the same set of diagnostic criteria.

The number of OCPD diagnoses at age 16 years was slightly higher (n = 18) than at age 21 years (n = 15). However, the overlap between obsessive-compulsive problems at diagnostic study and at follow-up evaluation was extensive, and there were only two cases with OCPD at
age 21 years who had not shown severe obsessive-compulsive symptoms, OCD, or OCPD at age 16 years. Conversely, all except one of those diagnosed at age 16 years as suffering from OCPD still had severe obsessive-compulsive symptoms, OCD, or OCPD at age 21 years. Interestingly, the rate of avoidant disorder, also part of cluster C of the DSM-III-R, was low in the diagnostic study (n = 1) and considerably higher in the follow-up study (n = 7) in the AN group. If the rate of OCPD and avoidant disorder (similar in several key areas pertaining to social interaction problems) was combined, it was identical in the two studies (37%). Casper, in her study of personality features in good-outcome restricting AN, found a high rate of avoidant personality disorders. Her patients were older than the individuals in our study. It could be that as the individuals with AN grow older, they fit the avoidant personality disorder diagnosis better than the OCPD one. Both OCPD and avoidant personality disorder were uncommon in the COMP group of non-eating-disordered individuals.

Our prevalence rate of 41% personality disorder is somewhat lower than that found by Gartner et al. in a clinical population (57%), and we submit that this might be due to ours being a sample more representative of the unselected population with AN. However, the rate of OCPD (26%) in their study was closely similar to that found in our study (30%).

Empathy disorders (including Asperger’s syndrome and other autistic-like conditions) were present in almost 30% of the AN group and in only 4% of the blindly examined COMP group. Empathy disorder is not a widely used diagnostic concept, but it has recently been suggested to be associated with (or indeed to underlie) a number of psychiatric disorders such as obsessive-compulsive symptoms in some cases, OCD, some cases of Tourette’s syndrome, Asperger’s syndrome, and autism. The diagnosis can be made with a good degree of reliability. The presence of empathy disorder in the individual with AN better predicted poor outcome than the presence of the eating disorder per se. As many as four of the 51 individuals (8%) with AN (and none of those in the COMP group) met full diagnostic criteria for Asperger’s syndrome whether outlined by Gillberg and Gillberg or the ICD-10. The reason that this association has not been reported by other groups is possibly that the diagnosis of Asperger’s syndrome is not well known in psychiatry.

The high rate of social interaction problems, communication failure, and ritualistic/obsessive-compulsive phenomena in the AN group suggests a link with ASD even in some cases who do not meet full criteria for ASD. Gillberg and Råstam hypothesized that in some cases, AN may just be one of the ritualistic phenomena expressed by an individual with a life-long autistic-like condition. Supportive of a connection between AN and ASD is the finding of AN in the extended families of children afflicted with autism, and the occurrence of Asperger’s syndrome in fathers and mothers of adolescents with AN. We are well aware that some clinicians (and researchers) will protest that they have never seen autistic-like problems in AN. We do not contradict this, but would like to point out that that which you do not look for you will not find. Most clinicians (and researchers) appear to agree that alexithymia (the inability to talk about/verbalize feelings) is common in eating disorders. We would like to posit that the alexithymia shown by so many individuals with AN may be a reflection of an underlying empathy disorder, causing not only an inability to talk about affective states, but also an impairment in the ability to conceive of mental states generally. Such an impairment has been shown to be important in autism and ASD. It is noteworthy that, just as in the studies of alexithymia, there was no correlation between degree of weight loss and presence of empathy disorders or personality disorders coded on axis II, meaning that the emaciated state of the individuals did not contribute to the personality style. Also, at age 22 years most of the individuals with AN were in good physical shape and well-nourished and yet retained the same type of personality/personality disorder.

The three males with AN in the study deserve special mention, if only for the simple reason that males are only rarely included in the study of AN. All three were recovered from the eating disorder. One had Asperger’s syndrome and an IQ of 127. He had poor outcome in social aspects and a low score (indicating poor out-
come) on the Morgan-Russell scales. Another one (IQ 113) had been “eating-disordered” (restricting AN) for several years before “recovering” at age 18 years. He had had a generalized anxiety disorder and a longstanding depression, but was psychiatrically alright at age 20 years (when he took part in the present follow-up study). The third male (IQ 98) had shown obsessive-compulsive symptoms (without meeting criteria for OCD or OCPD) and tics during the course of the eating disorder, but was completely recovered at age 21 years. Males with AN should receive more attention in future studies of AN. Perhaps one way forward in this area would be to conduct multicenter studies with pooling of (similarly derived) data from several different groups.

Our findings only demonstrate the clear difference between AN subjects and a normal sample from the community. It does not address the issue of possible AN specificity. To be able to draw conclusions in this respect, one would have to include a community-based COMP group with a non-eating-disorder psychiatric disorder. It is of some interest to compare our findings with those from a recent study of personality disorders (and axis I disorders) in 16- to 17-year-olds with attention deficit disorders and motor perceptual problems—a group with a very high rate of associated severe psychiatric comorbidity.26 In that study, only 9% of the index group (and 0% of the normal COMP group at age 16 to 17 years) had OCPD. This suggests that in AN we may be dealing with an underlying personality problem that may be more specific to the eating disorder than to psychiatric disorder generally. However, axis II diagnoses in the follow-up study of attention deficits and motor perceptual problems were based on information obtained at interview with the PDE, which possibly tends to underdiag-

nose personality disorder as compared with the SCID.14

Our findings pertaining to personality disorders in the longitudinal perspective in AN follow-up evaluation suggest that despite tendencies for AN to exacerbate certain concurrent symptoms (notably other abnormal eating-behavior and affective symptoms, see part II), axis II diagnoses remain important indicators of both comorbidity and outcome. This conclusion accords well with that of Steiger et al.37 in a recent study of comorbid features in bulimia nervosa before and after therapy. It seems that in some cases, AN may be just one of the several different axis I diagnoses presenting in the lives of individuals affected with a particular variant of a chronic personality disorder.

As has been pointed out by Gartner et al.,4 one of the ultimate goals of personality disorder studies in eating disorders is to assist in the identification of subgroups of individuals who might differentially benefit from various kinds of treatment. The realization that a considerable subgroup of individuals with AN have personality problems and empathy disorders with early-childhood onset should inspire new approaches in treatment. For instance, the presence of intrinsic personality factors, including difficulty in empathizing with the perspectives of other people, in AN individuals suggests that clinicians may again have to pay more attention to the needs of the individual patient, including educational measures and individual psychotherapy and pharmacotherapy.

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