



Alexithymia, empathy, emotion identification and social inference in anorexia nervosa: A case-control study



Carla Gramaglia^a, Francesca Ressico^a, Eleonora Gambaro^a, Anna Palazzolo^a, Massimiliano Mazzarino^d, Fabrizio Bert^c, Roberta Siliquini^c, Patrizia Zeppegno^{a,b,*}

^a Institute of Psychiatry, Department of Translational Medicine, Università del Piemonte Orientale, Via Solaroli n° 17, 28100 Novara, Italy

^b AOU Maggiore della Carità, Corso Mazzini n° 18, 28100, Novara, Italy

^c Department of Public Health and Paediatric Sciences, Università degli Studi di Torino, via Santena 5/bis, 10126 Torino, Italy

^d Casa di Cura San Giorgio, Viverone, Italy

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ABSTRACT

Alexithymia, difficulties in facial emotion recognition, poor socio-relational skills are typical of anorexia nervosa (AN). We assessed patients with AN and healthy controls (HCs) with mixed stimuli: questionnaires (Toronto Alexithymia Scale-TAS, Interpersonal Reactivity Index-IRI), photographs (Facial Emotion Identification Test-FEIT) and dynamic images (The Awareness of Social Inference Test-TASIT). TAS and IRI Personal Distress (PD) were higher in AN than HCs. Few or no differences emerged at the FEIT and TASIT, respectively. Larger effect sizes were found for the TAS results. Despite higher levels of alexithymia, patients with AN seem to properly acknowledge others' emotions while being inhibited in the expression of their own.

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1. Introduction

Impaired emotional functioning and alexithymic traits are core elements of anorexia nervosa (AN). (Courty, Godart, Lalanne, & Berthoz, 2015; Torres et al., 2015). Patients with AN, compared to healthy controls, show a concrete, reality-based cognitive style and a poor inner emotional and fantasy life. Jenkins and O'Connor (2012) suggested the phrase “cognitive–affective division” to describe the difficulty shown by patients with Eating Disorders (EDs) when trying to translate what they “think” cognitively into what they “feel” emotionally. Poor skills in emotion regulation (ER), especially when facing negative moods, may lead patients to eating disordered behaviors, which seem to offer a short term comfort or distraction, to the detriment of more adaptive strategies (Skårderud, 2007; Smyth et al., 2007; Svaldi, Griepenstroh, Tuschen-Caffiera, & Ehring, 2012). Identification of facial information and emotional expression is a core component of social life and interpersonal communication, and impaired skills in this cognitive processing ability are likely to play a role as regards patients' social functioning deficits, social phobia, social isolation, avoidance and persistent social impairments, even after recovery from AN (Kaye, Bulik, Thornton, Barbarich, & Masters, 2004; Nilsson, Gillberg, Gillberg, & Rastam, 1999).

* Corresponding author at: Institute of Psychiatry, Università degli Studi del Piemonte Orientale, Corso Mazzini n°18, 28100 Novara, Italy.

E-mail address: patrizia.zeppegno@med.uniupo.it (P. Zeppegno).

The current literature suggests that, compared to healthy individuals, people with AN have deficits in emotion regulation across a variety of domains. Difficulties in recognizing facially displayed emotions have been described, although it is not clear whether these are independent from alexithymia (Kessler, Schwarze, Filipic, Traue, & von Wietersheim, 2006), and whether they are influenced by comorbid psychopathological conditions, such as depression (Manuel & Wade, 2013; Mendlewicz, Linkowski, Bazelmans, & Philippot, 2005; Parling, Mortazavi, & Ghaderi, 2010). Apart from difficulties in the recognition of facial emotions, especially negative ones (i.e., sadness and fear), people with AN may show impairments in the recognition of emotions in voices, both positive and negative (particularly happiness and sadness) (Kucharska-Pietura, Nikolau, Masiak, & Treasure, 2004).

There is a debate as whether there are different patterns of emotional processing deficiencies in different subtypes of EDs, whether emotional regulation and emotional processing difficulties are a unique hallmark of EDs, and whether these are state- or trait-dependent conditions. Although ER difficulties and social problem solving skills may be impaired in the acute phase of AN, due to the direct effects of starvation on the brain (Anderluh, Tchanturia, Rabe-Hesketh, & Treasure, 2003; Craig et al., 2008), there is evidence that women with AN experience premorbid social difficulties, and that such difficulties persist after recovery (Jacobi, Hayward, De Zwaan, Kraemer, & Agras, 2004). Beadle, Paradiso, Salerno, and McCormick (2013) found no improvement after weight restoration and suggested that alexithymia and personal distress

may be trait features of AN. On the contrary, a better performance in emotional inference in the self and the others has been found in recovered patients than in currently ill ones by [Oldershaw, Hambrook, Tchanturia, Treasure, and Schmidt \(2010\)](#). Nonetheless, recovered patients compared to healthy controls still showed some slight impairment, particularly in recognizing positive emotions; moreover, patients with AN, both currently ill and recovered, seemed to be actually making greater efforts than healthy controls despite their poorer performance in recognizing emotions. A correlation between ED symptoms and severity and measures of ER impairment has been suggested as well ([Svaldi et al., 2012](#)).

The importance of all these issues depends also on the fact that difficulties identifying feelings may play the role of maintaining factors for AN, and impact on prognosis. These factors are likely not disorder-specific for AN (for instance, a possible overlapping between AN and autism spectrum disorders has been suggested), nonetheless in people with AN they may interfere with the healing process ([Oldershaw et al., 2010](#)). For instance, a 3-year longitudinal study ([Speranza, Loas, Wallier, & Corcos, 2007](#)), found the Difficulty Identifying Feeling factor of the Toronto Alexithymia Scale significantly predicted treatment outcome, independent of depressive symptoms and ED severity.

The aim of our study was to add to the existing literature about these issues, comparing alexithymia, empathy, facial emotion identification and social inference abilities in people with AN and healthy controls (HCs). Considering the instruments we used, we also wanted to discriminate whether AN patients were more impaired than controls when assessed about alexithymia, ER skills and social inference via a pencil-and-paper questionnaire, photographs, or dynamic images depicting emotions and social interactions (see [Methods](#)).

2. Method

2.1. Participants

We recruited all the patients with a current diagnosis of AN referred to the outpatient and inpatient service for Eating Disorders of the Institute of Psychiatry, Maggiore della Carità Hospital, Novara (Italy), and to a collaborating Psychiatric Clinic (Casa di Cura San Giorgio, Viverone), in a 2-year period (from June 2013 to June 2015). Inclusion criteria for the patients' sample were: 1) current diagnosis of AN according to DSM-IV-TR ([American Psychiatric Association, 2000](#)); 2) age > 18 years; 3) no comorbid psychosis or drug abuse; 4) availability to give informed written consent to participate in the study. HCs similar for age were recruited among female University students and trainees, their friends and relatives, aged > 18 years, with no comorbid psychosis or drug abuse and no current or past Axis I diagnosis. Assessment and diagnosis of patients and HCs were performed by experienced psychiatrists with the aid of the Structured Clinical Interview for DSM-IV-TR (SCID-I) ([First, Spitzer, Gibbon, & Williams, 2002](#)). The project was approved by the Institutional Review Board of our Institution. Informed consent was obtained.

2.2. Materials

HCs were given an appointment and tested in a single session. Patients' assessment with the aid of the SCID-I was performed during the first psychiatric interview; their Body Mass Index (BMI, Kg/m²) was measured. Patients were then given a second appointment the following week; they were asked to fill the self-administered questionnaires and were assessed with the tests described hereby.

2.2.1. Interpersonal Reactivity Index (IRI) ([Giamarra et al., 2015; Penn et al., 1994](#))

The IRI is a 28-item self-administered questionnaire assessing four dimensions of dispositional empathy: Perspective Taking (PT), Fantasy (F), Empathic Concern (EC), and Personal Distress (PD). PT describes

the tendency to spontaneously adopt the psychological point of view of others; F measures the tendency to imaginatively transpose oneself into the feelings and actions of fictitious characters in books, movies, and plays. The EC subscale measures other-oriented feelings of sympathy and concern for others in distress. The PD subscale assesses self-oriented anxiety when experiencing others in distress. Cronbach's alphas for the four scales were PT = .54, F = .77, EC = .69 and PD = .50, respectively. High internal consistency and good test–retest reliability and convergent validity were found for the IRI ([Davis, 1983](#)).

2.2.2. Toronto Alexithymia Scale (TAS-20) ([Bagby, Parker, & Taylor, 1994](#))

Self-administered 20-item scale assessing the three core elements of the alexithymia construct: Difficulty Identifying Feeling (DIF), Difficulty Describing Feelings (DDF), and Externally Oriented Thinking (EOT). This last factor, EOT, also indirectly assesses (reduced) fantasy and imaginal activity ([Taylor, Bagby, & Parker, 1997](#)). A score greater than 61 indicates the presence of alexithymia ([Bagby, Taylor, Parker, & Dickens, 2006](#)). The TAS has good psychometric properties (Cronbach's alpha 0.81; test–retest reliability 0.77).

2.2.3. Facial Emotion Identification Test (FEIT) ([Erol, Mete, Sonmez, & Unal, 2010; Kerr & Neale, 1993](#))

The FEIT is an interactive computer task containing facial expression stimuli (posed by actors) associated with 6 basic emotions (anger, disgust, fear, happiness, sadness, surprise), and neutral faces. The task includes 55 black and white photos presented on a computer screen for 15 s, then immediately replaced by a blank screen. Participants are asked to indicate the emotion seen by pressing a labeled key on the keyboard as soon as they identify it. The software then calculates the number of correct answers for each emotion subset, a total score and reaction times. Cronbach's alphas were as follows: nonclinical controls, alpha = .37; acute-care participants, alpha = .52; and extended-care participants, = .41.

2.2.4. The Awareness of Social Inference Test (TASIT) ([McDonald, Flanagan, & Rollins, 2002; McDonald et al., 2006](#))

The TASIT is divided into three parts. Part 1 – Emotion Evaluation Task–EET: 28 short (15–60 s) video clips of social interactions, each featuring one of the six primary emotions (happiness, sadness, anger, surprise, disgust and fear) or neutral affect. Each emotion (including neutral affect) is represented in four different video clips. The participants are required to identify the emotional state of the central protagonist by making a forced choice from seven emotional descriptors presented simultaneously in a paper chart. Part 2 and 3 – Social Inference Minimal and Enriched (SI-M and SI-E) consist of 15 and 16 short (15–60 s) video clips, respectively, including sincere, false and sarcastic dialogs, so that the subject has to infer the real meaning of the message by observing the affective state of the person talking (facial expression, tone of voice), and the environment. Cronbach's alpha for the TASIT is 0.81 ([Roberts & Penn, 2009](#)).

Both the FEIT and TASIT have already been used together for the assessment of social cognition in schizophrenic patients ([Galderisi et al., 2014](#)).

2.3. Data analyses

All the analyses were performed using the statistical software STATA 13 ([StataCorp, 2013](#)). Initial descriptive statistics included frequencies and percentages for categorical variables and the chi-squared test to evaluate the differences in proportions between groups. The continuous variables were reported using the mean and the standard deviation. Normal distribution of data was verified using Shapiro–Wilk test. Mean comparison between groups was carried out using Student's t-test.

A two-tailed p value < .05 was considered significant for all analyses. The Cohen's d was used to calculate the effect size correlation.

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