Reviewer’s report

Title: Emotional facial expression in women recovered from anorexia nervosa

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Reviewer: Timo Brockmeyer

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The present study sought to investigate whether not only currently-ill patients with anorexia nervosa (AN) but also those in the recovered state (i.e., women with a history of AN) are characterized by impairments in the facial expression of emotions. Therefore, the authors compared 49 currently-ill AN patients, 21 recovered AN patients (RecAN), and 53 healthy controls (HC). Participants were asked to watch three emotion-eliciting film-clips (positive, neutral, and negative) and to rate their current mood after each of these. While watching, participants were filmed and these videos were subsequently rated for the frequency of facial expressions of positive and negative emotions.

Analyses revealed that AN showed less positive expressions during positive film-clips as well as less negative expressions during negative film-clips as compared to RecAN and HC (irrespective of depressive symptoms). Thus, representing one major finding, the results suggest that currently-ill AN patients are characterized by generally attenuated facial expression of emotions, irrespective of valence. However, less frequent emotional expressions during negative film-clips may in AN be due to more “looking away” as the results also suggest. Regarding the authors’ main hypotheses, RecAN do not seem to be characterized by deficits in mood-congruent facial expression of emotions (i.e., similar frequency of positive expressions during positive film-clips and of negative expressions during negative film-clips as compared to HC). However, RecAN (like AN) were found to show altered mood-incongruent facial expression of emotions in the present study (i.e., greater frequency of negative expressions during positive film-clips). The authors present a number of interesting interpretations for this astonishing finding and offer testable hypotheses for future research.

In summary, I enjoyed reading the manuscript and believe that the research reported provides a valuable contribution to the research literature. The authors should be complemented on conducting and reporting a well-designed and interesting study. In addition, the authors are commended for conducting a power analysis in order to gain a sufficient sample size before accomplishing the study. Another strength of the study lies in the assessment of not only current but also past episodes of mental illnesses and in using a family history of an eating disorder (ED) as a further exclusion criterion for HC. Furthermore, the authors are commended for testing for differences between medicated and un-medicated subjects in order to control for this potential confounder.
All in all, they present well defined research questions, use appropriate methods to answer these questions, and present sound data. The discussion of the results is well balanced and limitations of the present study are illustrated in detail. Furthermore, the manuscript is well written and meets the relevant standards of reporting, and the authors clearly state that results are based on an extended sample who were reported in a previous study.

The following points are suggestions how the manuscript could be amended to improve presentation and readability.

Major Compulsory Revisions

None.

Minor Essential Revisions

Methods:

2) The authors may wish to explain why they have decided to exclude subjects younger than 16 and older than 55 years. Why did they use particularly these thresholds?

3) The authors may also wish to explain why they have chosen 18.5 as the upper BMI limit for currently-ill AN since typically 17.5 is used as a threshold value.

4) The authors should clarify whether any participant in the RecAN group met criteria for any current DSM-IV diagnosis, apart from ED.

5) It would be helpful for the reader if the authors let them know about the mean length of the film-clips they have used. In addition, the authors may wish to add some information regarding the selection and the content of these three film-clips, and why they have decided not to use a counterbalanced order of presentation.

6) Regarding the second last subheading in the method section: did the authors mean “Coding the Facial Expressions” instead of “Coding the Film Clips”?

7) The authors should state whether all film-clips (or rather some of them) have been coded by two raters, and whether the mean scores obtained from both raters were used in further analyses.

Results:

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8) In the method section, the authors stated that a) frequency, b) intensity, and c) duration of facial expressions were rated. However, in the results section they only refer to the frequency of expressions. The authors should state why they decided to do so and may therefore refer to previous studies that have also focused solely on frequency (Kring & Gordan, 1998; Kring & Neale, 1996). Alternatively, the authors may add a foot note indicating that using a composite
score combining frequency, intensity, and duration of expressions yields similar results.

9) In cases where no significant differences between groups have been observed (e.g., regarding positive expressions during the sad and the neutral clip), the authors may wish to add p values (“all ps > XY”).

Discussion:

10) The authors are commended for presenting very interesting ideas how to explain the rather surprising main finding of greater incongruent emotional expression during positive film-clips in RecAN and AN as compared to HC and thus for providing testable hypotheses for future research. However, the authors may wish to also discuss the discrepancy between the results in the present study and the results in their previous study (Davies et al., 2008). In their previous study, currently-ill AN patients did not show significantly more negative emotional expressions during positive film-clips than HC. However, in the present study, AN as well as RecAN did so. Maybe, this discrepancy can be explained by the larger sample size in the present study [all the more, as there seems to be a similar difference between AN and HC in the previous study (p value = .06) that has just not reached statistical significance]. Furthermore, the authors may wish to also discuss the possibility that less frequent negative expressions during negative clips in AN may be due to more frequent “looking away” in this group.

11) The authors should state in the limitations section that data regarding illness duration was only available for half of the AN sample.

Discretionary Revisions:

Introduction:

12) In the introduction, the authors refer to “recent maintenance models” of AN which highlight socio-emotional deficits. Along these lines, they state that altered facial expression of emotions may impact effective emotion regulation and social interaction in patients with AN. It may be helpful for those readers who are not very familiar with these models (note that this is not a specialized eating disorder journal) to explain and exemplify how and through which mechanisms altered facial expression of emotions may influence emotion regulation and social interaction and how this may contribute to the maintenance of the disorder. Similarly, it would be interesting to read about possible functions of reduced facial expression of emotions in currently-ill AN patients (e.g., reducing aversive intra- or interpersonal consequences of emotional disclosure such as being overwhelmed by unpleasant feelings or rejection and humiliation by others).

Discussion:

13) As a further suggestion, the authors may wish to also consider interpreting the observed lack of mood-congruent emotional expression in AN but not RecAN as a function of food restriction and weight loss (cf. Arkell & Robinson, 2008; Brockmeyer et al., 2012; Haynos & Fruzzetti, 2011; Kaye, 2005, 2008; Serpell et
It may be that food restriction and weight loss serve to avoid aversive affective experiences (and thus also expressions of them) in AN. Maybe, self-starvation dampens not only the experience of negative emotions but of any emotion. However, in the recovered state (i.e., in normal weight) the assumed affect-attenuating effects of starvation may disappear and thus, RecAN may not longer differ from HC in expressing stimuli-congruent emotions.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests.