Executive functioning in anorexia nervosa: Exploration of the role of obsessionality, depression and starvation

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Abstract

Cognitive deficits related to executive functioning have been previously identified in anorexia nervosa (AN). Currently, there is limited knowledge about the degree to which other variables related to AN or executive function may influence the observed relationships. The present study examined three groups of participants, women with AN (n = 22), and two control groups: women who were high in obsessionality (n = 20) and women who were low in obsessionality (n = 21). Women reporting disordered eating over the previous 4 weeks were screened out of the control groups. Executive function was measured using the Wisconsin card sorting test (WCST) and the uses of common objects test (UCOT). In addition, depression, obsessionality and body mass index were measured. Initial analyses showed no significant differences between the groups on executive function, but moderate effect sizes were obtained for performance on UCOT total perseverations and WCST total trials. When controlling for either depression or obsessionality, the group differences on the UCOT total perseverations became significant and in the case of depression attained a large effect size. Both the AN and high obsessionality groups showed significantly more perseverations than the low obsessionality group. Depression appeared to suppress variance that was irrelevant to the prediction of perseverance thus enhancing the importance of group membership. It is recommended that variables strongly associated with AN be investigated in future research as this may clarify the relationship between AN and executive function.

Keywords: Executive function; Perseverance; Anorexia nervosa; Obsessionality; Depression

1. Introduction

People with anorexia nervosa (AN) typically display reduced cognitive functioning across a range of domains, including executive functioning, visual–spatial ability, attention, learning and memory (Lena et al., 2004). Whilst it has often been suggested that the deficits associated with AN are caused by starvation or the effects of malnutrition (e.g., Lauer et al., 1999), it has been recently suggested that such deficits may be present from early childhood and constitute risk factors for the development of disordered eating (Lena et al., 2004). Consistent with such a suggestion is a finding that executive functioning continued to be impaired in people who had recovered from AN, indicating that the deficits were at least partially independent of nutritional status (Tchanturia et al., 2004b).

Arguably the most clinically relevant deficits associated with AN are related to executive function or mental flexibility (Cooper and Fairburn, 1992; Fassino et al., 2002; Green et al., 1996; Tchanturia et al., 2004a; Tchanturia et al., 2004b). Rigidity and lack of flexibility are core characteristics of the behaviour of people with AN (Vitousek et al., 1998). This characteristic lack of flexibility reduces the ability to fully engage in therapy, which impinges on the recovery of the patient.
One recent study (Tchanturia et al., 2004a) examined the relationship between some of the clinical features of AN, including obsessionality and depression, and performance on neuropsychological tests. Their primary aim was to examine differences in cognitive flexibility between groups with AN, bulimia nervosa and a non-disordered eating control group. They found that AN group showed significantly more difficulty with tests of cognitive flexibility that related to simple alternation and perceptual shift than the control group but that there was no difference with respect to tests of perseveration or mental flexibility. The AN group also had a significantly lower body mass index (BMI) than the controls, and scored significantly higher on the Maudsley Obsessional Compulsive Inventory (MOCI: Hodgson and Rachman, 1977) and the depression measure than the control condition. When obsessionality, depression and BMI were entered separately as covariates, the contribution of group membership to performance on the tests of cognitive flexibility remained significant. This suggests that group differences observed with respect to executive functioning were independent of both obsessionality and depression.

The central aim of the present study was to further investigate the existence of any differences in executive functioning between women with AN and two control groups, people low in obsessionality and people high in obsessionality. Further, variables that can be expected to confound or obscure the relationship between cognitive flexibility and AN (i.e., obsessionality, depression and starvation) will also be investigated.

2. Materials and methods

2.1. Participants

There were three groups of participants in the present study. The first two groups were obtained by screening 110 female undergraduate students using the Vancouver Obsessive Compulsive Inventory (VOCI; Thordarson et al., 2004) that assesses levels of obsessionality, and the Eating Disorder Examination Questionnaire (EDE-Q: Fairburn and Beglin, 1994) that assesses disordered eating over the previous four weeks. Participants \( n = 24 \), 22% were excluded if they reported either, or both, of the following: (a) binge eating at least once a week accompanied by loss of control and clinical levels of weight and shape concerns (scoring 4–6 on a 0–6 Likert scale) and/or (b) purging or fasting (e.g., not eating for at least eight waking hours for the purpose of influencing weight or shape) at least once a week.

Of the remaining participants, those scoring in the top 25% and bottom 25% on the VOCI were selected, respectively, as the high obsessionality group \( n = 20 \) and the low obsessionality group \( n = 21 \). The mean...
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