Food-cue affected working memory performance, food craving, and eating behavior

Background

Executive functions, such as working memory, are tightly intertwined with self-regulation [1]. Food-cues and dealing with food cravings have been found to impair working memory performance [2,3]. Impaired working memory performance has also been found in current dieters [4]. However, recent studies highlight the importance for differentiating between successful and unsuccessful dieters, for example in the context of executive functions and self-control [5,6]. The current study investigated food-cue affected working memory performance as a function of dieting and dieting success in female participants.

Method

- Young women (N = 70, age M = 22.0 years ± 3.28, BMI M = 21.47 kg/m² ± 2.82) performed an n-back task involving pictures of food and neutral objects (Fig. 1).
- The task consisted of a block with food pictures and a block with neutral pictures (order of blocks counterbalanced across subjects).
- Each block contained 120 trials including 30 targets.
- Measures of interest were reaction times and omission errors.
- Participants completed the Food Cravings Questionnaire – State (FCQ-S) before the task, after the first block, and after the task.
- They also completed questionnaires on their dieting behavior and -success among others.

Results

- Reaction times in the food block (M = 595.4 ms ± 102.6) were slower than in the neutral block (M = 573.3 ms ± 112.1, t(69) = 2.4, p = .02).
- Omission errors did not differ between block types (t(69) = 0.7, ns).
- Self-reported current food craving was increased after performing the food block (difference score M = 5.0 ± 7.0, t(67) = 5.9, p < .001) and decreased after the neutral block (difference score M = -2.3 ± 5.3, t(67) = 3.6, p = .001).
- An interaction between current dieting × dieting success predicted reaction times and omission errors such that dieting success was associated with faster reaction times and with fewer omission errors in the food block in current dieters (Fig. 2). Those effects were independent of food deprivation, current food craving, body mass index and restrained eating.

Successful dieters had a better working memory performance than unsuccessful dieters, particularly in response to high-calorie, palatable foods. Thus, results further support associations between executive functioning and eating-related self-regulation. They also highlight the importance of considering both current dieting status and dieting success rather than restrained eating in such research. Future studies may investigate if a working memory training that specifically involves food-cues is useful for enhancing dieting success in unsuccessful dieters and for reducing over- or binge eating in individuals with eating disorders or obesity.

References


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