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### **Proceedings of the Annual Meeting of the Cognitive Science Society**

#### **Title**

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#### **Permalink**

<https://escholarship.org/uc/item/2f01t7bg>

#### **Journal**

Proceedings of the Annual Meeting of the Cognitive Science Society, 28(28)

#### **ISSN**

1069-7977

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#### **Publication Date**

2006

Peer reviewed

# How Do Cognitive Processes Support Over-eating?

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## Background

We examine the contribution of attentional processes to overeating. Attentional processes appear to contribute to substance abuse in many cases (alcohol, smoking). Correlations between substance abuse and attentional biases can be motivated in a straightforward way. According to Tiffany (1990), every time a person drinks, a link is established between the context in which the drinking takes place (e.g., the person's living room), the act of drinking, and positive emotions. Frequent links, eventually, become automatic (Logan, 1998), a process enhanced by the inherently reinforcing properties of the substances abused. Thus, in seeing the chair where the person usually drinks, she would be compelled to think of drinking.

Research into alcohol-related attentional biases has been very prominent, because there is a simple correlation between quantity of drinking and corresponding attentional biases (Cox et al., in press). With overeating things are not simple, and the literature suggests that factors other than quantity of consumed food lead to attentional biases for food-related stimuli. Possible factors are restrained eating (Francis et al., 1997) and external eating, that is eating in response to the appetitive qualities of food. In the present research, external and restrained eating are examined with the Dutch Eating Behavior Questionnaire (DEBQ; Van Strien et al., 1986).

## Experimental investigation

Participants in Greece and Iran were recruited from University campuses/ local communities. Average age, weight, and height for the 98 Iranian participants were 20.7 years, 58.1 Kg, and 1.66 m and for the 60 Greek ones 20 years, 66.9 Kg, and 1.75 m. Males formed 39% of the Iranian sample and 50% of the Greek sample.

Participants completed a food-version of the emotional Stroop test, and then the DEBQ questionnaire. For the Stroop task, we constructed a card with 20 neutral, travel-related words presented four times. The words were printed in four colors. A second card with food-related words was created in the same way. The food words were selected to be a combination of 'forbidden' foods (foods that are generally excluded from a weight-loss diet), 'allowed' foods, and foods that are more in between with respect to their diet relevance (e.g., potato).

We highlight the main findings. Stroop interference for food-related words was computed for each participant as the *total* time taken to go through the food words minus the total time required for the neutral ones. Participants were slower with the food card than with the control card by about 2.5 seconds ( $t(1,157)=3.6$ ,  $p<.0005$ ). The external and restrained eating scales of the DEBQ were dichotomized (rank-ordered within the Greek and Iranian sample separately). We then constructed an ANOVA, with food Stroop interference as the dependent variable, and country, gender, external eating, restrained eating as between participant factors. Our main result is an interaction between external and restrained eating ( $F(1,142)=736.4$ ,  $p=.002$ ). Participants trying to restrain their eating and sensitive to the appetitive qualities of food were most sensitive to food cues. Interestingly, participants low on restraint and not sensitive to food appetitive qualities also displayed high levels of attentional bias—these are possibly participants who are pre-occupied with body shape and keeping fit. No significant results involving country were identified.

In sum, our results presently highlight a complex interaction between restrained eating and sensitivity to the appetitive qualities of food in determining attentional biases towards food cues.

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