

I eat when I'm sad, I eat when I'm glad : on the role of cue reactivity and classical conditioning in emotional eating

Citation for published version (APA):

Bongers, P. M. H. (2015). I eat when I'm sad, I eat when I'm glad : on the role of cue reactivity and classical conditioning in emotional eating. [Doctoral Thesis, Maastricht University]. Maastricht University. <https://doi.org/10.26481/dis.20151215pb>

Document status and date:

Published: 01/01/2015

DOI:

[10.26481/dis.20151215pb](https://doi.org/10.26481/dis.20151215pb)

Document Version:

Publisher's PDF, also known as Version of record

Please check the document version of this publication:

- A submitted manuscript is the version of the article upon submission and before peer-review. There can be important differences between the submitted version and the official published version of record. People interested in the research are advised to contact the author for the final version of the publication, or visit the DOI to the publisher's website.
- The final author version and the galley proof are versions of the publication after peer review.
- The final published version features the final layout of the paper including the volume, issue and page numbers.

[Link to publication](#)

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal.

If the publication is distributed under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license above, please follow below link for the End User Agreement:

www.umlib.nl/taverne-license

Take down policy

If you believe that this document breaches copyright please contact us at:

repository@maastrichtuniversity.nl

providing details and we will investigate your claim.

Valorization Addendum

This valorization addendum highlights the significance of the studies presented in this dissertation. This is done by outlining the way in which our studies are relevant for society, by explaining which target groups will benefit from the results, and by providing future possibilities in terms of activities and products resulting from the findings. In addition, the innovative aspects of the current studies are discussed. Finally, manners in which knowledge resulting from the studies has been disseminated are given, and ideas and plans for future knowledge dissemination are made.

Relevance of the studies

It is no secret that obesity is one of the biggest health issues of our time. In the last decades, the prevalence of obesity and overweight has risen steadily, and the turning point has yet to come. As we speak, approximately 70% of the adult population in the US is overweight or obese (Ogden, Carroll, Kit, & Flegal, 2014). In the Netherlands, this number is close to 50% (Health Monitor, 2012). Obesity is related to serious physical and psychosocial health concerns, and has a significant societal and economical impact. Clearly, measures need to be taken not only to stop the obesity-epidemic from rising any further, but also to knock down the current figures. To mitigate current obesity levels, research into all factors that contribute to excessive weight gain is of utmost importance. One of the most obvious factors leading to overweight and obesity is overeating, of which emotional eating is considered a specific case. To be able to address and treat emotional eating correctly, it is crucial that the phenomenon is correctly understood. Questions that therefore need to be answered include which emotions elicit overeating, whether certain individual characteristics can make one more susceptible to emotional eating, and how emotional eating develops and is maintained. The studies described in this thesis address these questions.

Chapters 2, 3 and 4 shed light on the exact cues that elicit overeating in emotional eating. Chapter 5, although not focused on emotional eating per se, investigates the influence of weight status, impulsivity and trait craving on how individuals respond to food cues. Chapters 6 and 7 focus on classical conditioning as a developmental or maintenance factor in emotional eating.

Who benefits from the findings?

The findings as discussed in this dissertation are relevant to three distinct target groups: researchers, health care professionals, and individuals looking for assistance in controlling their (emotional) eating behaviour. Researchers with an interest in emotional eating benefit from the current studies in that these studies add new information to the existing knowledge regarding emotional eating, for example in terms of the importance of positive emotions and the role of classical conditioning. Although this dissertation does not lead to a full and complete understanding of emotional eating, the studies do contribute to the field, and fellow researchers could build on the used paradigms and obtained findings when designing new studies on this topic. Health care professionals could use the results from the studies when treating (overweight) individuals who engage in emotional eating. The results from the first three chapters stress that treatment should likely not only focus on negative emotions, but also on positive emotions and perhaps even other cues that lead to overeating. The final two chapters introduce classical conditioning as a mechanism in emotional eating. Knowledge about factors that lead to or maintain emotional eating will enable therapists to adjust treatment to be more effective. The final target group, individuals who engage in emotional eating, can benefit from the findings in the sense that a full understanding of the concept of emotional eating can, in the end, lead to purposeful and effective treatment of this type of overeating. A reduction of overeating would in turn lead to weight loss and a decrease in both the physical and mental health problems associated with overweight and obesity.

Activities and products

In general, only a small part of scientific research can be immediately translated into tangible activities, products, processes or services. Mostly, however, this is a much slower process, with many studies making small but essential contributions to a larger whole. The same is true for the studies in this dissertation: they all contribute to a better understanding of emotional eating. Importantly, the better emotional eating is understood, the better preventions or interventions aimed at this phenomenon can be. Although the current

studies might not lend themselves for direct translation to activities and products, they are essential to the optimal design of activities, products, processes and services in the future.

One type of activity or product that could eventually be derived from the present results relates to therapeutic strategies. Based on the classical conditioning principle of extinction, cue exposure with response prevention (CERP; see chapter 8 of this dissertation for a more detailed description) has been developed as a treatment strategy aimed at reducing food intake. In CERP, the association between a cue that signals food on the one hand and actual food intake on the other hand is overruled by a stronger cue – no food intake association. This is accomplished through repeated presentation of the food-cue without it being followed by eating. CERP has been shown to be effective in reducing overeating in various populations, such as overweight adults, overweight children, and patients suffering from Bulimia Nervosa (Boutelle, et al., 2011; Jansen, Broekmate, & Heymans, 1992; Martinez-Mallén, et al., 2007; Schyns, Roefs, Mulkens, & Jansen, 2015; Toro, et al., 2003). The cues commonly used in these studies are the sight and smell of palatable food. Although CERP has not yet been tested specifically with regard to emotional cues, it is likely to have potential for reducing emotion-induced overeating. Upon positive evaluation of CERP with emotional cues in studies involving clinical samples, this strategy could be implemented by therapists in the treatment of emotional eating.

Innovation

The studies presented in this dissertation are innovative in several ways. Chapters 2-4 challenge the prevailing assumption that emotional eating reflects overeating in response to specifically negative emotions. In addition, chapters 3 and 4 go beyond the traditional identification of emotional eaters based on questionnaire scores (whose validity is debatable) by also classifying individuals as emotional eaters depending on their performance on an IAT and on their actual food intake when feeling negative. Although these classification measures are in need of more research, they do hold high face validity. Chapter 5 was the first study to investigate the combined effects of weight status and impulsivity on attention bias. Chapters 6 and 7 are highly innovative because they are among the few studies that do not merely describe food consumption of emotional eaters (i.e., changes in intake in response to the experience of specific emotions), but are instead aimed at the mechanisms underlying emotional eating. More specifically, these chapters experimentally test two different pathways through which classical conditioning could serve as an aetiological and/or maintaining factor in emotional eating. Although classical conditioning has been previ-

ously suggested to be involved in emotional eating (Jansen, 1998; Jansen, Havermans, & Nederkoorn, 2011; Wardle, 1990), these studies are the first to put this hypothesis to the test.

Planning and implementation

Concerning activities, products, processes or services, we intend to conduct studies on extinction and CERP for emotional cues in both student and clinical samples. These studies are the next step in testing the suitability of CERP as a treatment technique for individuals who engage in emotional eating.

With regard to knowledge dissemination, we have undertaken various efforts to ensure that the knowledge obtained from our studies reached the three target groups. To spread the findings of the studies to the international research community, we have published papers in several international journals. In addition, we have presented all the findings at international conferences, which are frequented by researchers from all over the world. Findings have also been published in Dutch journals and presented at Dutch conferences. Through these Dutch channels results have not only reached Dutch scientists, but also a broader audience of mental health care professionals. Some of the studies, particularly chapter 2 and chapter 3, have been picked up by the international media. This ensured dissemination of the research findings to the general public. The studies were for example featured on medicaldaily.com (a US-based medical news website), artikalmagazin.de (a German online magazine), spirehealthcare.com (the second largest provider of private health-care in the UK), and menshealth.com (the US website of the popular and well-known Men's Health magazine). Furthermore, the studies were given more national attention through an interview for a youth version of the Dutch magazine *GezondNU*.

In the future, we plan to continue disseminating our research by means of national and international journal publications, national and international conference visits, and bringing the findings to the attention of the general public by using traditional and social media. The latter will be achieved through for example press releases, media interviews, and blog posts. I have followed a course on 'scientific writing for a broad audience', which was aimed at helping scientists to translate their scientific findings into interesting and easy-to-understand articles intended for the lay public.

References

- Boutelle, K. N., Zucker, N. L., Peterson, C. B., Rydell, S. A., Cafri, G., & Harnack, L. (2011). Two novel treatments to reduce overeating in overweight children: a randomized controlled trial. *Journal of consulting and clinical psychology, 79*(6), 759.
- Health Monitor 2012 [Gezondheidsmonitor GGD'en, CBS en RIVM, 2012. In Dutch]. WWW Document (2013, September 12). Statistics Netherlands. Retrieved from <http://www.cbs.nl/nl-NL/menu/themas/gezondheid-welzijn/cijfers/incidenteel/maatwerk/2013-gezondheidsmonitor2012-mw.htm>. Accessed March 2015.
- Jansen, A. (1998). A learning model of binge eating: cue reactivity and cue exposure. *Behaviour research and therapy, 36*(3), 257-272.
- Jansen, A., Broekmate, J., & Heymans, M. (1992). Cue-exposure vs self-control in the treatment of binge eating: a pilot study. *Behaviour Research and Therapy, 30*(3), 235-241.
- Jansen, A., Havermans, R. C., & Nederkoorn, C. (2011). Cued overeating *Handbook of Behavior, Food and Nutrition* (pp. 1431-1443): Springer.
- Martinez-Mallén, E., Castro-Fornieles, J., Lázaro, L., Moreno, E., Morer, A., Font, E., et al. (2007). Cue exposure in the treatment of resistant adolescent bulimia nervosa. *International Journal of Eating Disorders, 40*(7), 596-601.
- Ogden, C. L., Carroll, M. D., Kit, B. K., & Flegal, K. M. (2014). Prevalence of childhood and adult obesity in the united states, 2011-2012. *JAMA, 311*(8), 806-814.
- Schyns, G., Roefs, A., Mulkens, S., & Jansen, A. (2015). Expectancy violation, reduction of food cue reactivity and less eating in the absence of hunger after one food cue exposure session for overweight and obese women. Manuscript submitted for publication.
- Toro, J., Cervera, M., Feliu, M., Garriga, N., Jou, M., Martinez, E., et al. (2003). Cue exposure in the treatment of resistant bulimia nervosa. *International Journal of Eating Disorders, 34*(2), 227-234.
- Wardle, J. (1990). Conditioning processes and cue exposure in the modification of excessive eating. *Addictive Behaviors, 15*(4), 387-393.