Olfactory conditioning reinforced by saccharin in humans: Influence of prop taster and sweet liker status

M.R. YEOMANS[1,*], N. GOULD[1], J. PRESCOTT[2]. [1] *Department of Psychology, University of Sussex, Brighton, United Kingdom* [2] *School of Psychology, University of Newcastle, Callaghan, Australia*

Repeated retronasal exposure to novel food odours with sweet and bitter tastes can lead to subsequent changes in orthonasal liking and sensory experience of the taste-paired odours. PROP tasters have been reported to rate low concentrations of saccharin as more bitter and less sweet than do PROP non-tasters. We therefore predicted that acquired liking for, and sweetness and bitterness of, odours conditioned by association with saccharin would vary depending on PROP taster status. 87 volunteers evaluated two novel odours before and after co-experience of one odour with 4 mM/l saccharin and the second with water. PROP taster status was assessed from the intensity of 3.2 mM PROP relative to 1.0 M NaCl, and sweet-liker status from liking ratings for 0.21 and 0.83 M/l sucrose and 0.0004 M/l and 0.0010 M/l saccharin. Liking for the saccharin-paired odour increased in sweet likers but decreased in sweet-dislikers. Overall liking change also varied with PROP taster status, with both odours rated less pleasant post-training in the super-taster and taster but not non-taster groups. The saccharin-paired odour was rated sweeter post-training, regardless of PROP taster or sweet-liker status. PROP super-tasters rated the saccharin-paired odour as more bitter post-training, in-line with enhanced bitterness of saccharin in this group. These data confirm that sensory and hedonic changes operate independently olfactory conditioning, and are influenced by individual differences in sensitivity to bitter and sweet stimuli.

doi:10.1016/j.appet.2008.04.265

Heightened responses to the hedonic qualities of sucrose in olfactory conditioning for women scoring high on the three-factor eating questionnaire disinhibition scale

M.R. YEOMANS*, N.J. GOULD, S. MOBINI, L.C. CHAMBERS. *Department of Psychology, University of Sussex, Brighton, United Kingdom*

In flavour–flavour learning (FFL), repeated co-experience of a novel flavour and a hedonically valanced flavour can lead to changes in liking for the novel flavour. Some studies suggest that restrained eaters are insensitive to FFL, while disinhibited eaters may over respond to hedonic stimuli. Here we assessed FFL through associations between food-related odours and sweet and bitter tastes to explore further how eating attitudes influence FFL. 52 women, pre-selected to be high or low on the restraint and disinhibition factors from the Three-Factor Eating Questionnaire (TFEQ), evaluated two novel odours orthonasally before experiencing retronasal pairings of one odour with sucrose and the second with quinine before orthonasal re-evaluation of the odours. At post-training, overall liking increased for the sucrose-paired odour but this effect was greater in women with high scores on the TFEQ disinhibition factor. Liking for the quinine-paired odour decreased equally in all groups. The sucrose-paired odour was rated as sweeter, and quinine-paired odour more bitter at post-training and these acquired sensory qualities were unaffected by restraint or disinhibition factors from the TFEQ. Overall, these data found no evidence of impaired FFL in restrained women, but instead found greater responsiveness to hedonic qualities of sucrose in women scoring high on the disinhibition factor, consistent with suggestions that this factor identifies individuals with heightened hedonic sensitivity to food.

doi:10.1016/j.appet.2008.04.266

Palatability and the stimulation of appetite: A role for learning

M.R. YEOMANS . *Department of Psychology, University of Sussex, Brighton, United Kingdom*

It is well established that the hedonic quality of the flavour of food (i.e. palatability) is an important determinant of short-term food intake. Detailed analysis of changes in appetite within meals suggested that palatability effects are generated through orosensory reward mechanisms which translate the hedonic evaluation of orosensory stimulation by food into enhanced motivation to eat, indicated by increased hunger in the early stages of meals with palatable foods. However, the hedonic quality of food is in a large part a learned response. Two distinct but interacting types of association may partly underlie the acquisition of palatability. The first, flavour–flavour learning, is based on associations between new flavour elements and existing liked or disliked components such as sweet tastes, while the second, flavour-consequence learning, is based on associations between flavours and post-ingestive effects of nutrients. While many studies have demonstrated that both these associations can increase liking, only recently have we been able to assess whether these acquired likes also stimulate intake. Our recent finding that flavour–nutrient associations can stimulate intake suggest that energy-dense foods may promote active as well as passive over-consumption, while new data also suggest enhanced appetite through flavour-flavour associations. The implications of these observations for understanding overeating in the context of the current obesity crisis is explored.

doi:10.1016/j.appet.2008.04.267

Fluoxetine-induced anorexia is exaggerated in adolescent female rats that experienced neonatal maternal separation

S.B. YOO[1,*], V. RYU[1], Y.W. MOON[2], J.H. LEE[1], J.W. JAHNG[1]. [1] *Dental Research Institute, Seoul National University School of Dentistry, Seoul, South Korea* [2] *Department of Biology, The Catholic University of Korea College of Medicine, Seoul, South Korea*

We have previously reported that repeated pre-weaning maternal separation (MS) leads to behavioral depression with alterations in brain 5-HT neurotransmission in rats. In this study, the effects of chronic fluoxetine, a selective 5-HT reuptake inhibitor, on feeding and brain 5-HT system were examined in adolescent female rats that experienced neonatal MS. Sprague–Dawley pups were separated from dam daily for 3 h during PND 1–14 (MS) or left undisturbed (NH). NH and MS females received either IP fluoxetine (5 mg/ 2 ml of saline/kg) or the same volume of saline daily from PND 35, and food intake and body weight were recorded daily. Between PND 42 and 45, rats were sacrificed for 5-HTT in situ hybridization in the raphe nucleus or for HPLC analysis of the brain 5-HT. Daily fluoxetine significantly suppressed body weight gains in both NH and MS females with a greater effect in MS group. Daily food intake was significantly reduced by a single injection of fluoxetine on PND 35 in both groups, and the reduction became bigger in MS group than in NH with repeated fluoxetine. Basal level of 5-HTT mRNA in the raphe nucleus was lower in the MS group. Chronic fluoxetine increased the raphe expression of 5-HTT mRNA in MS female, but not in NH. The results suggest that the increased anorectic property of fluoxetine in MS females may reveal a hyperresponsiveness of the brain 5-HT system by experience of neonatal maternal separation.

Acknowledgments: Supported by KMOST and MOEHRD (JWJ).

doi:10.1016/j.appet.2008.04.268