

# The status of Disinhibition and its role in predicting behaviour



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Dr Eleanor Bryant, UBVO, University of Oxford, 13<sup>th</sup>  
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# What is Disinhibition?

- Eating behaviour trait
  - Three Factor Eating Questionnaire (Stunkard & Messick, 1985)
- Measures a tendency to eat opportunistically or a readiness to eat (Bryant et al., 2008)



## **Disinhibition: its effects on appetite and weight regulation**

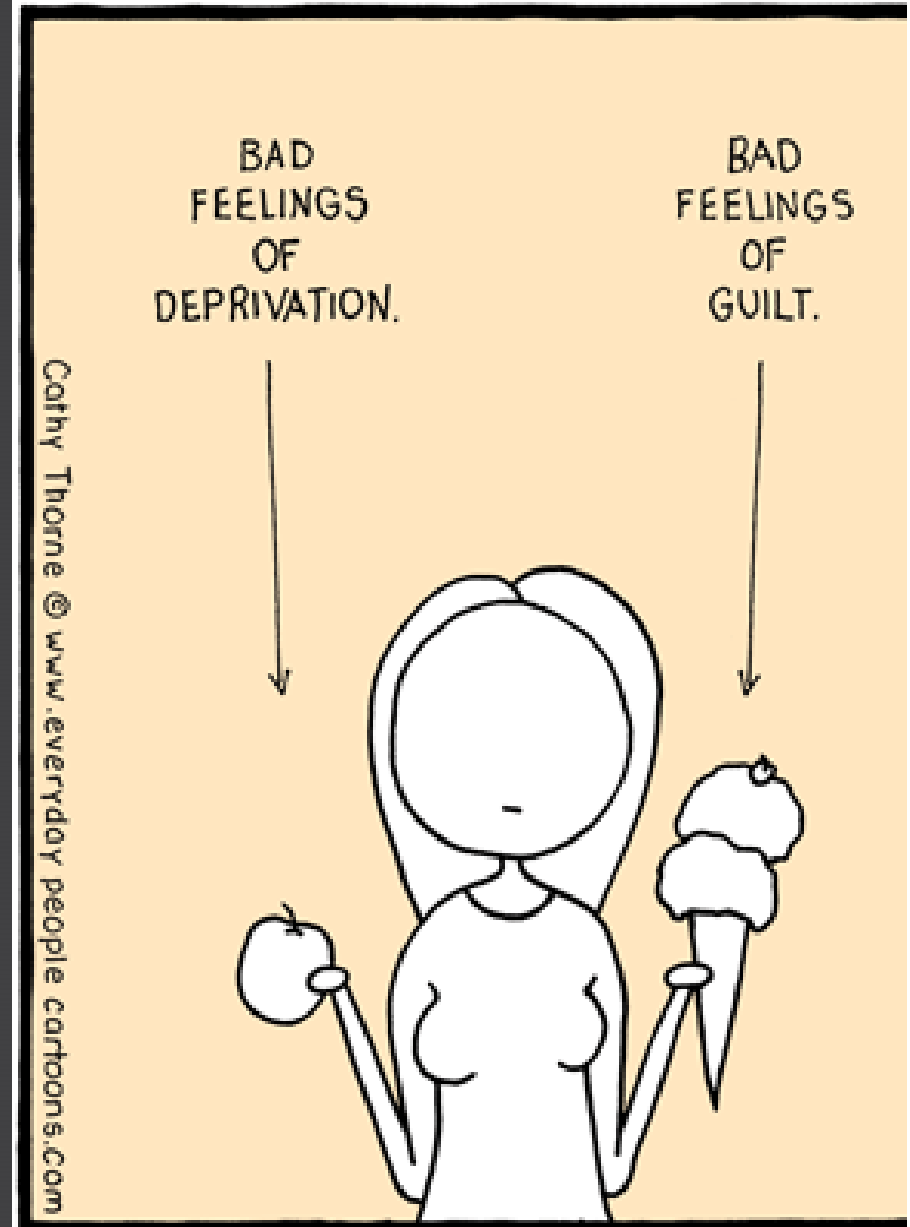
E. J. Bryant<sup>1</sup>, N. A. King<sup>2</sup> and J. E. Blundell<sup>1</sup>

### Disinhibition potent eating behaviour trait

- Higher BMI, body fat & waist circumference
- Weight gain
- Weight regain following weight loss
- Overeating
- Disturbed & disordered eating behaviour
- High liking of food, particularly HF & SW

# TFEQ

- **Restraint** – restrict food intake to control body weight
  - Associated with weight gain
  - Associated with weight regulation
- **Hunger** – perception of appetite sensations and the extent to which these elicit food intake
  - Associated with a higher body weight



CHOOSE YOUR BAD.

ORIGINAL  
RESEARCH  
PAPER

# Interaction between disinhibition and restraint: Implications for body weight and eating disturbance

E.J. Bryant<sup>1</sup>, K. Klezebrink<sup>2</sup>, N.A. King<sup>3</sup>, and J.E. Blundell<sup>4</sup>

## High Disinhibition, High Restraint =

- More likely to diet
- Higher vulnerability to disturbed eating (EAT-26)
- More likely to smoke
- Consume more alcohol
- Lower self-esteem
- Higher neuroticism

## High Disinhibition, Low Restraint =

- Higher weight
- Lower physical activity
- Low self-esteem
- High neuroticism

Research report

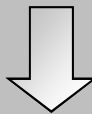
Psycho-markers of weight loss. The roles of TFEQ Disinhibition and Restraint in exercise-induced weight management<sup>☆</sup>

E.J. Bryant<sup>a,\*</sup>, P. Caudwell<sup>b</sup>, M.E. Hopkins<sup>c</sup>, N.A. King<sup>d</sup>, J.E. Blundell<sup>b</sup>

## 12 WEEKS OF AEROBIC EXERCISE



Baseline



Week 4



Week 8



Week 12

- Body weight & composition
  - Waist circumference
    - TFEQ
  - Energy intake

## Changes in Disinhibition and Restraint

- Decrease in BW ( $3.26 \pm 3.63$  kg)
- Increase in Restraint
- Decrease in Disinhibition
- No change in Hunger

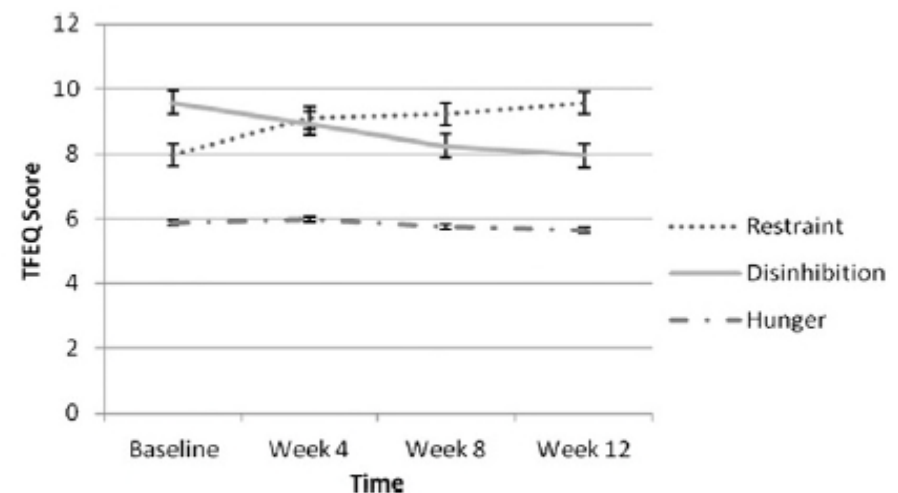


Fig. 1. Mean pooled changes in TFEQ factors during the 12 week exercise intervention.



# Changes in Disinhibition and Restraint: prediction of weight loss

- Higher baseline Disinhibition sig. predicted greater weight reduction
- ↓ Disinhibition ↑ Restraint, sig. associated with reduction in waist circumference
- Responders (-14.7kg) and non-responders (+1.7kg)

**Table 4**

Stepwise regression model predicting change in weight loss parameters (residualized) with change in TFEQ traits (residualized) and sub-factors (residualized).

Outcome	Model	Predictor	B	SE B	$\beta$	Partial $R^2$	Cumulative $R^2$	ANOVA
$\Delta$ Weight	1	$\Delta$ Restraint	-0.37	0.13	-0.36	–	0.13	$p = 0.005$
$\Delta$ Waist circumference	2	$\Delta$ Restraint	-0.42	0.12	-0.42	0.18	–	$p = 0.001$
		$\Delta$ Disinhibition	0.25	0.12	0.26	0.07	0.25	$p < 0.001$
$\Delta$ Weight	3	$\Delta$ Flexible Restraint	-0.35	0.12	-0.35	–	0.15	$p = 0.003$
		$\Delta$ External Disinhibition	0.33	0.12	0.33	0.10	0.25	$p < 0.001$
$\Delta\%$ Body fat	4	$\Delta$ Rigid Restraint	-0.29	0.14	-0.29	–	0.08	$p = 0.036$
$\Delta$ Waist circumference (cm)	5	$\Delta$ Rigid Restraint	-0.40	0.13	-0.40	–	0.16	$p = 0.002$

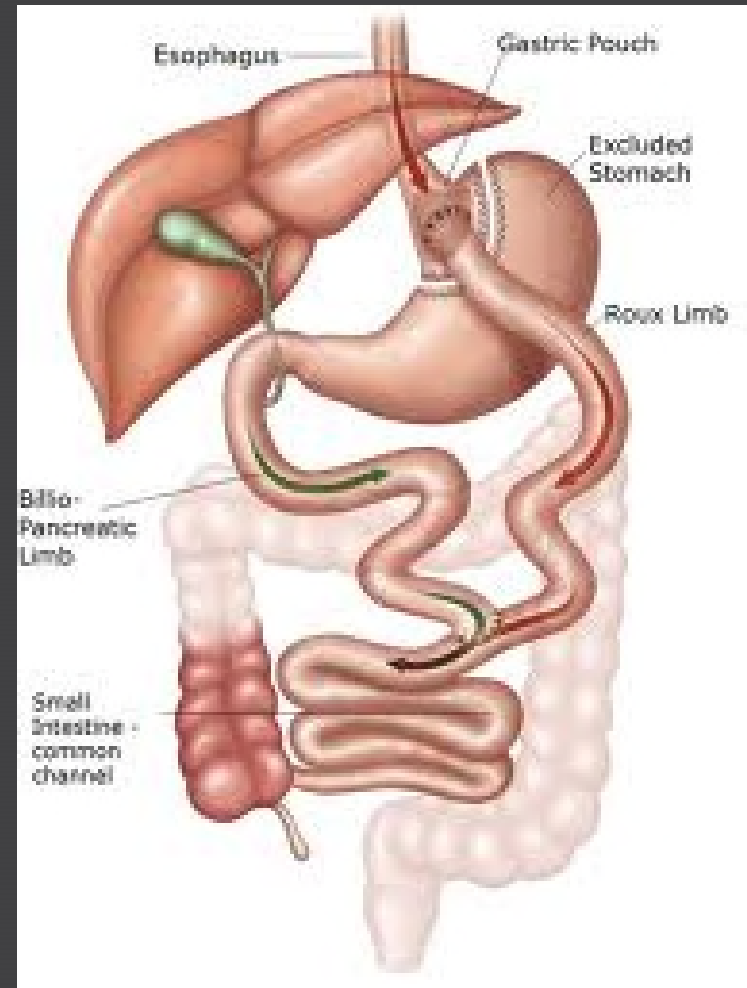
Variables included in the Models 1 and 2: baseline BMI, residualized change in energy intake, Disinhibition, Restraint and Hunger.

Models 3, 4 and 5: baseline BMI, residualized change in energy intake, Internal Disinhibition, External Disinhibition, Rigid Restraint and Flexible Restraint.



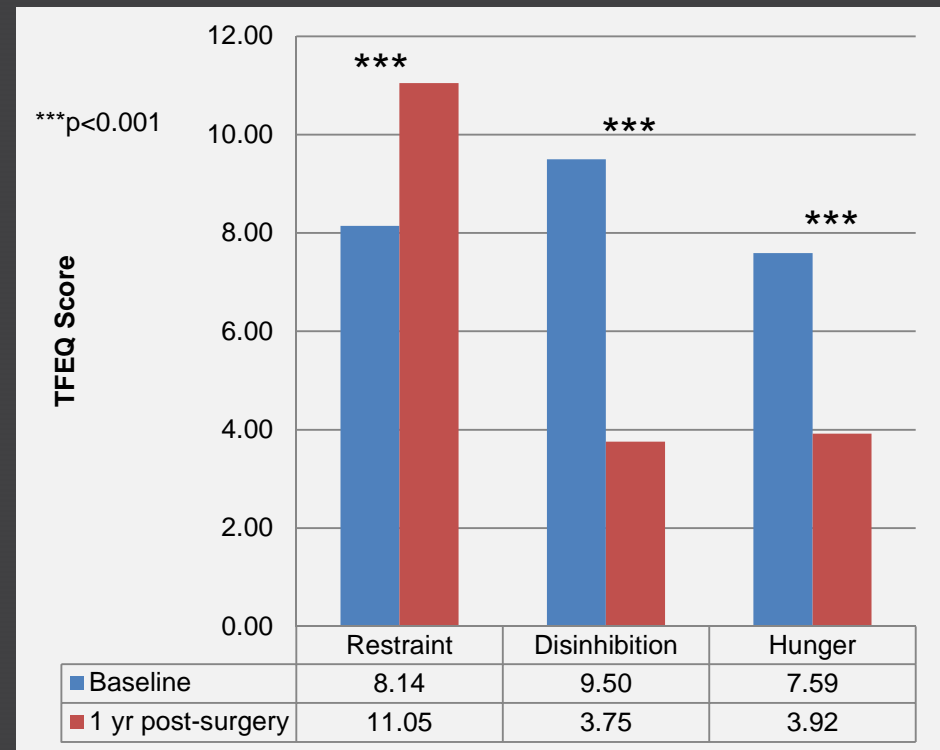
## **Bariatric surgery** (gastric by-pass): Changes in TFEQ (under review)

- 766 morbidly obese participants (605 females, 159 males)
- 117 post-surgical participants completed the TFEQ
- Ongoing data collection



## Bariatric surgery (gastric by-pass): Changes in TFEQ (under review)


- Weight loss 1yr: -37.5kg females, -45.8kg males
- ↑Restraint, ↓ Disinhibition, ↓Hunger
- Baseline TFEQ could not predict weight loss
- ↓ Disinhibition strongest predictor of weight loss
- Associations between BW and TFEQ strongest in females



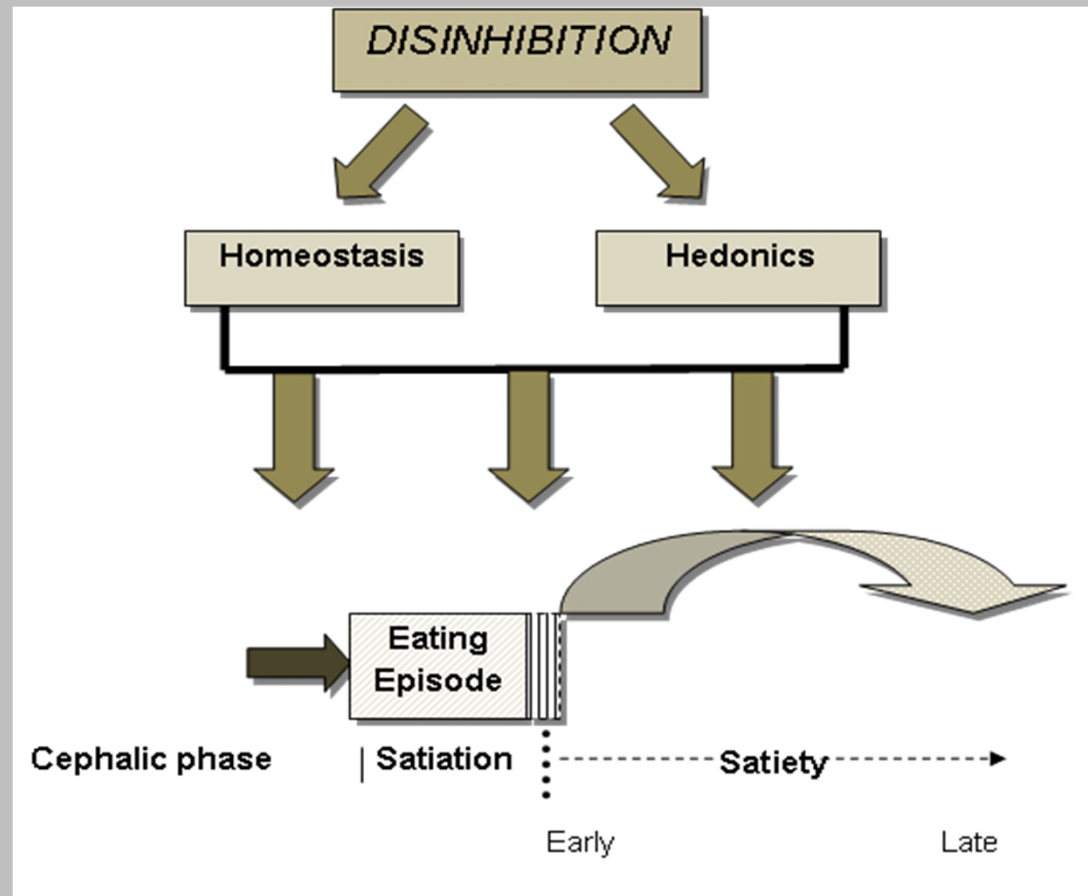
# What we know so far:

- Baseline D has a limited ability to predict subsequent weight loss
- Reduction in D v good predictor of subsequent weight loss
- D interacts with R to produce distinct weight and behaviour outcomes
- Mechanisms?

Cathy Thorne © www.everyday people cartoons.com



HOW CAN I BE EATING  
UNCONSCIOUSLY WHEN  
ALL I THINK ABOUT IS FOOD?



Bryant (2010). Disinhibition, appetite and weight in adults. In (Eds) Preedy, VR, Martin, C & Ross-Watson, R. *International Handbook of Behavior, Diet and Nutrition*. Springer: New York.

Integrated health article

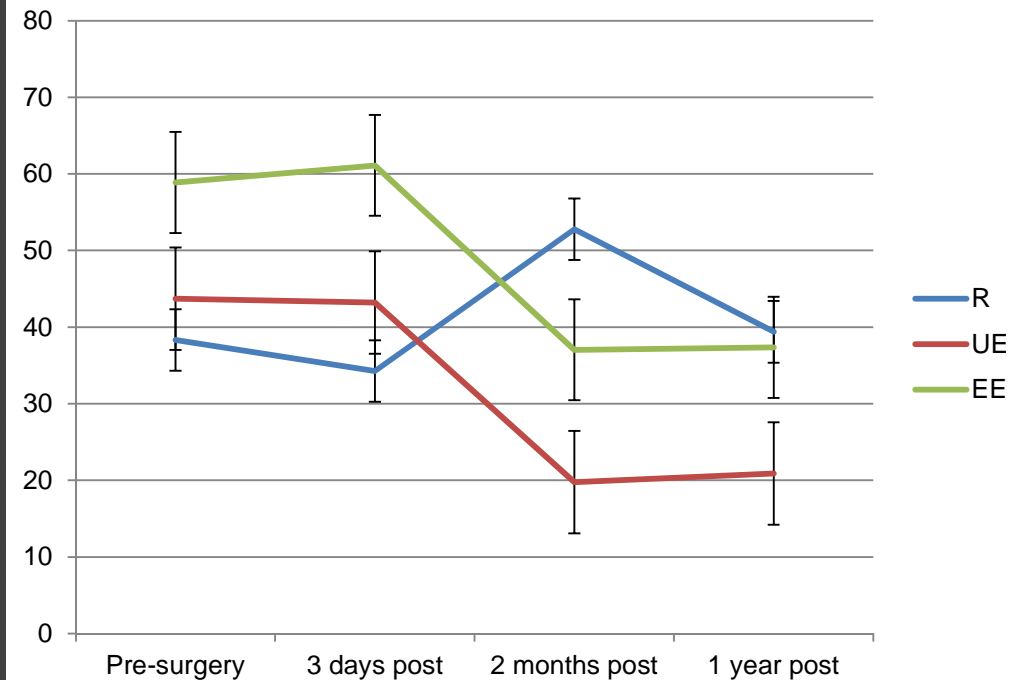
Relationships among tonic and episodic aspects of motivation to eat,  
gut peptides, and weight before and after bariatric surgery

Eleanor J. Bryant, Ph.D.<sup>a,\*</sup>, Neil A. King, Ph.D.<sup>b</sup>, Ylva Falkén, M.D.<sup>c</sup>, Per M. Hellström, M.D.<sup>d</sup>,  
Jens Juul Holst, M.D.<sup>e</sup>, John E. Blundell, Ph.D.<sup>f</sup>, Erik Näslund, M.D.<sup>c</sup>

- 12 obese individuals (BMI  $45 \pm 1.9$  kg/m<sup>2</sup>)
- Before, 3days, 2months & 1 year post-surgery
- Subjective appetite
- Ghrelin, leptin, insulin & GLP-1 measured for a 3-hour postprandial period.
- TFEQR18

# Changes in TFEQ

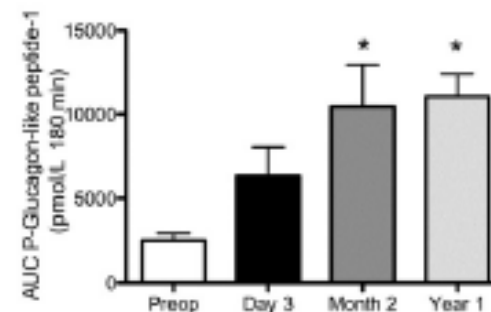
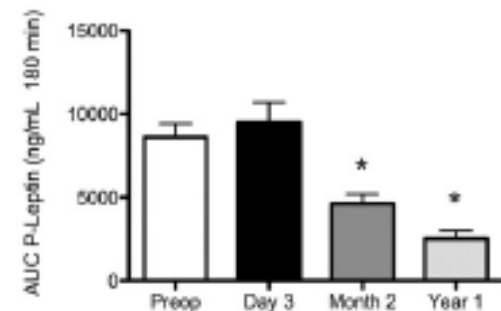
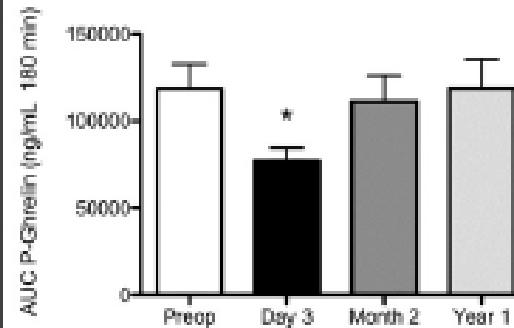
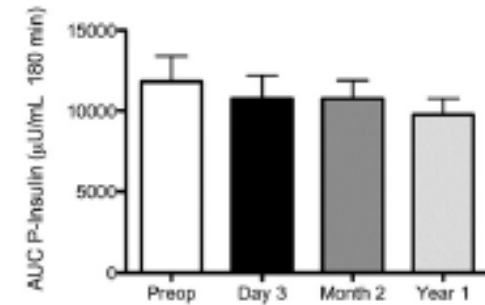
- One-year weight loss: -45.16kg
- Sig. ↓ Uncontrolled Eating, ↓ Emotional Eating
- No sig. change in Restraint





# Associations with TFEQ

- Baseline
- + EE fasting & AUC ghrelin
- + UE fasting insulin
- 1 year
- +  $\Delta$  CR &  $\Delta$  fasting & AUC ghrelin
- +  $\Delta$  EE &  $\Delta$  GLP-1



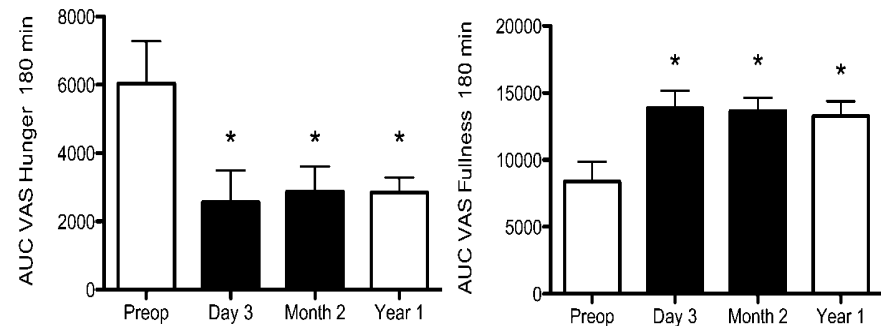
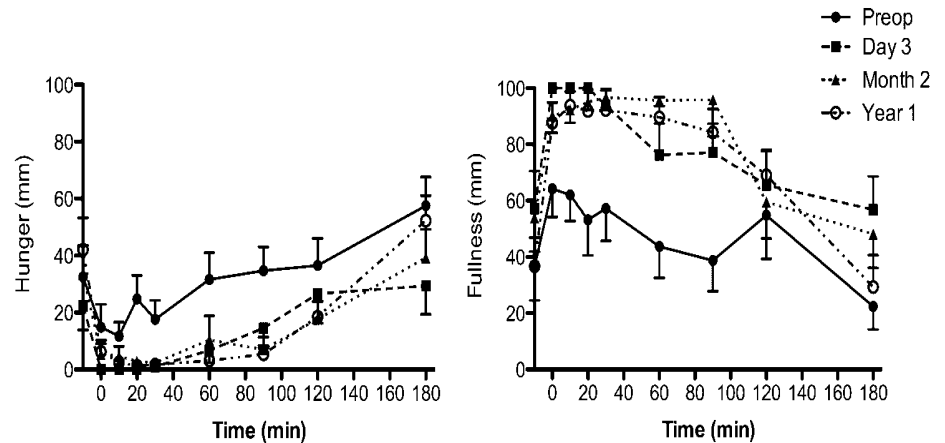
Falken et al, (2011)  
JCEM

# Associations with TFEQ

- **Baseline:**
- + association between desire to eat AUC & UE

## •1 year

- + association between hunger AUC & UE



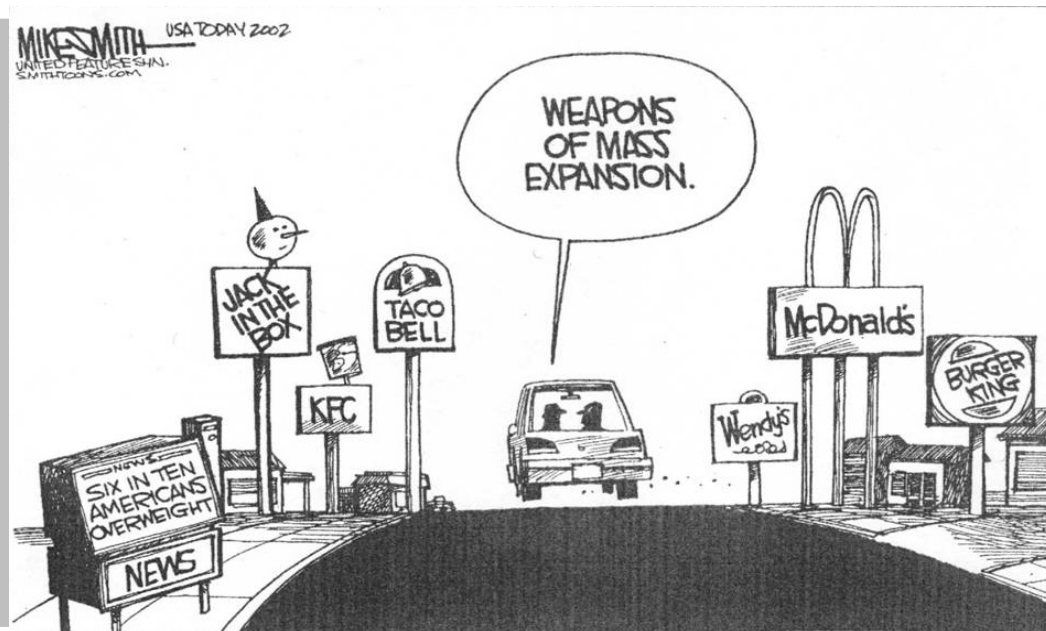
# What next?

**Intervention:** target D specifically

**Children:** what is the status of D in children?

Work underway, access to Born in Bradford.

Further work on **utility of TFEQ** in predicting weight loss outcomes.



# In conclusion

- D is a potent eating behaviour trait
- Change in D can predict weight loss outcomes well
- D has a biological underpinning
- TFEQ factors more powerful in females
- TFEQ eating behaviour traits associated with episodic appetite
- Baseline TFEQ has limited ability to predict subsequent weight loss.
- Target D specifically for improved weight regulation

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## Thank you to my collaborators:

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- 



**Thank you!**  
**Any Questions?**

