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MINDSET MATTERS:

Attentional focus – not body-weight – determines the level of food-related brain activity

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BACKGROUND

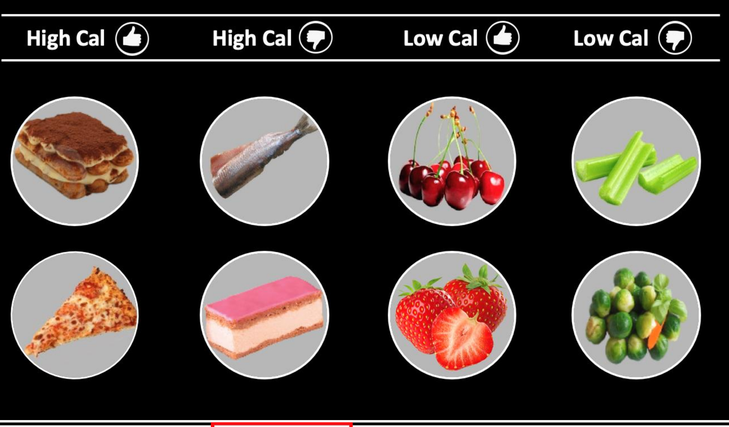
A dominant theory claims that viewing (high caloric) palatable foods leads to increased activity in the reward circuitry of the brain, especially for people with obesity [a,b]. However, the empirical literature is highly inconsistent [c]. One reason could be the double-sided nature of (high caloric palatable) foods: these foods are concurrently high in hedonic and low in health value. Therefore, viewing food pictures, people's attention may abruptly and frequently shift from hedonic to health or vice versa, complicating the interpretation of results.

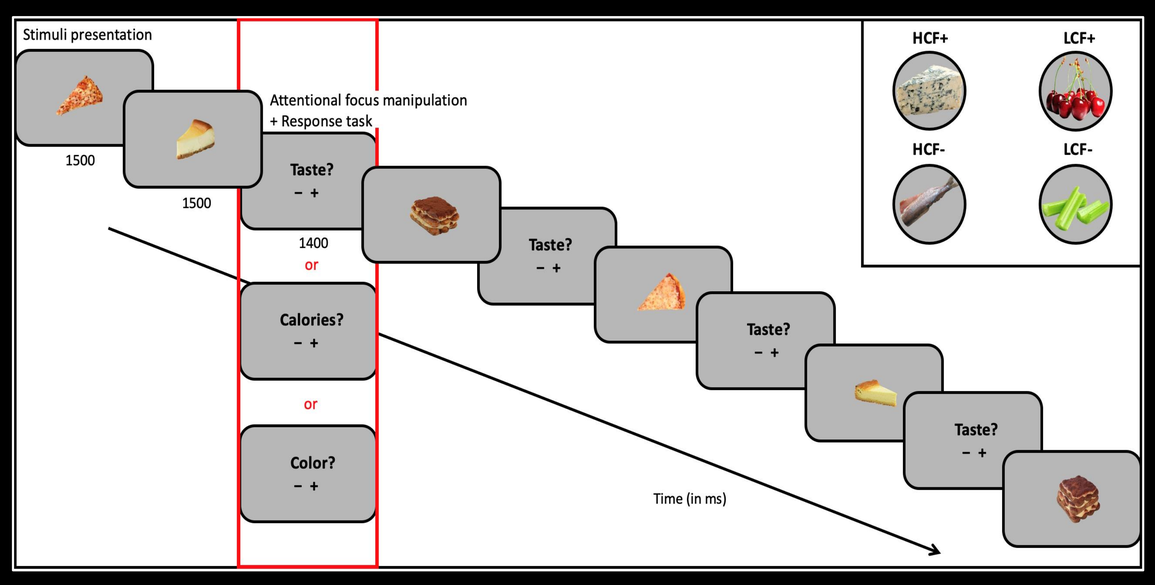
H: Attentional focus in interaction with BMI determines brain responses to visual food stimuli

Attentional focus	BMI-group
Hedonic (taste) ↑ mesocorticolimbic brain regions (e.g. OFC)	OB > HW
Health (calories) ↑ self-control brain activity (e.g. DL-PFC)	OB < HW

METHOD

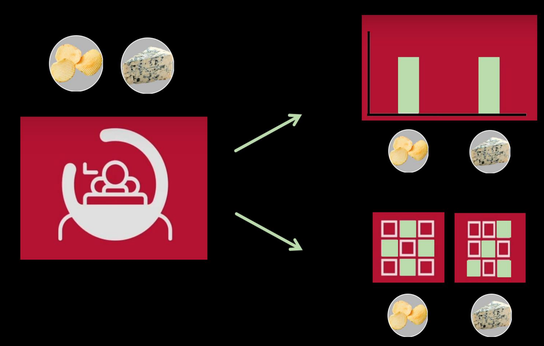
- 3T fMRI scanner (block design)
- *n* = 61 females: 32 with healthy BMI | 29 with obesity
- One-back task on individually tailored food stimuli





fMRI DATA ANALYSES

- **Mass Univariate analyses**
  (p < 0.05, *FWE* corrected)
- **Multivariate analyses (MVPA)**
  (p < 0.05, *FDR* corrected) [d,e,f]

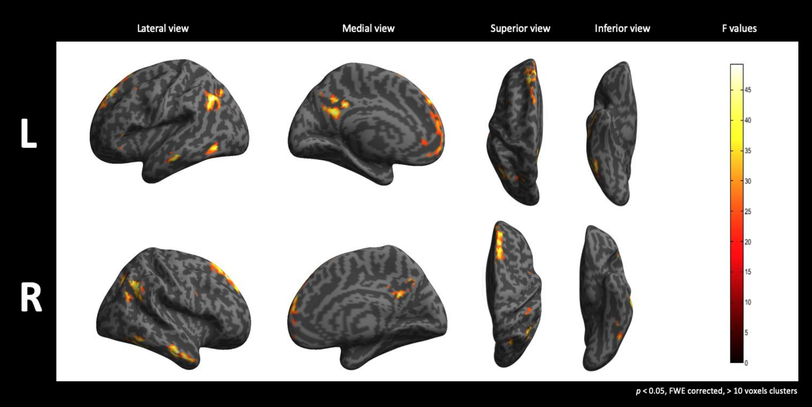


RESULTS

- **Mass Univariate analyses results:**

Main effect of attentional focus over frontal, parietal and temporal brain regions.

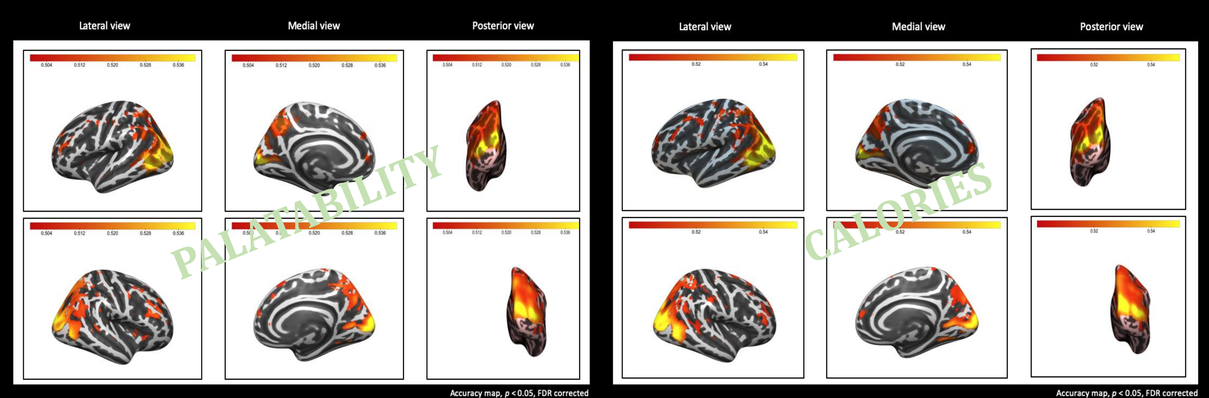
Hedonic focus (taste) **>** health focus (calories) and neutral focus (colors)



- **Multivariate analyses (MVPA) results:**

Calorie content and **palatability** could be **decoded above chance level** (frontal and occipital brain regions).

NS moderation by either mindset or BMI was found.



CONCLUSIONS

1. The level of brain activity depends on **ATTENTIONAL FOCUS** rather than BMI, calorie content, palatability
2. The level of brain activity, higher in the hedonic focus (taste), may reflect **MOTIVATIONAL SALIENCE** rather than reward
3. Food's **palatability** and **calorie content** are represented as ***patterns*** of brain activity (using MVPA)

REFERENCES: **(a)** Volkow et al., (2011). *Trends in Cognitive Sciences*, *15*(1), 37–46 | **(b)** Volkow et al., (2013). *Biological Psychiatry*, *73*(9), 811–818 | **(c)** Ziauddeen et al., (2012). *Nature Neuroscience Reviews*, *13*(4), 279–286 **(d)** Chikazoe et al., (2014). *Nature Neuroscience*, *17*(8), 1114–1122 | **(e)** Haxby et al., (2001). *Science*, *293*, 2425–2430 | **(f)** Norman et al., (2006). *Trends in Cognitive Sciences*, *10*, 424–430