

Disentangling brain representations of food stimuli

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Aree sensoriali e aree del piacere

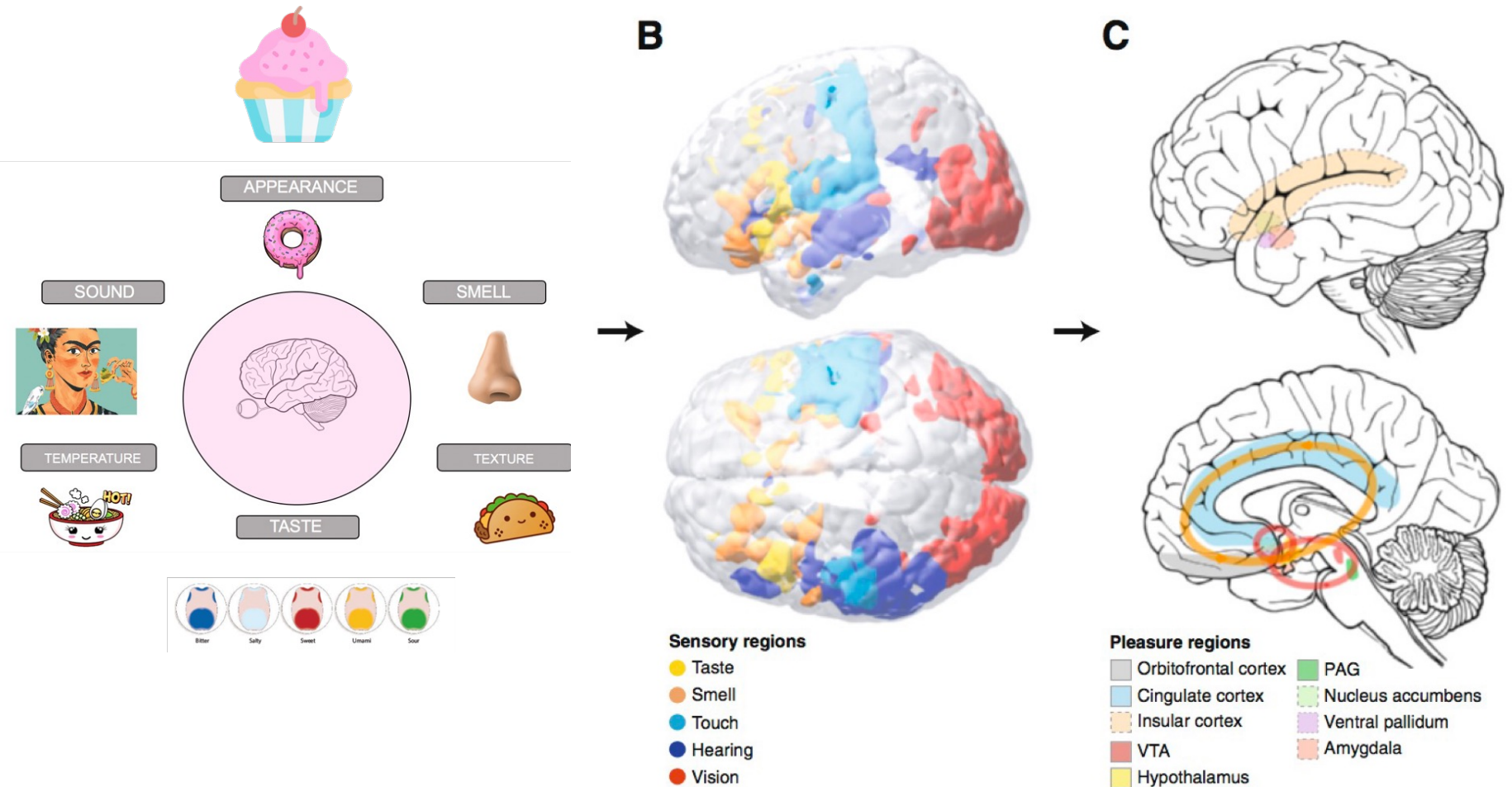
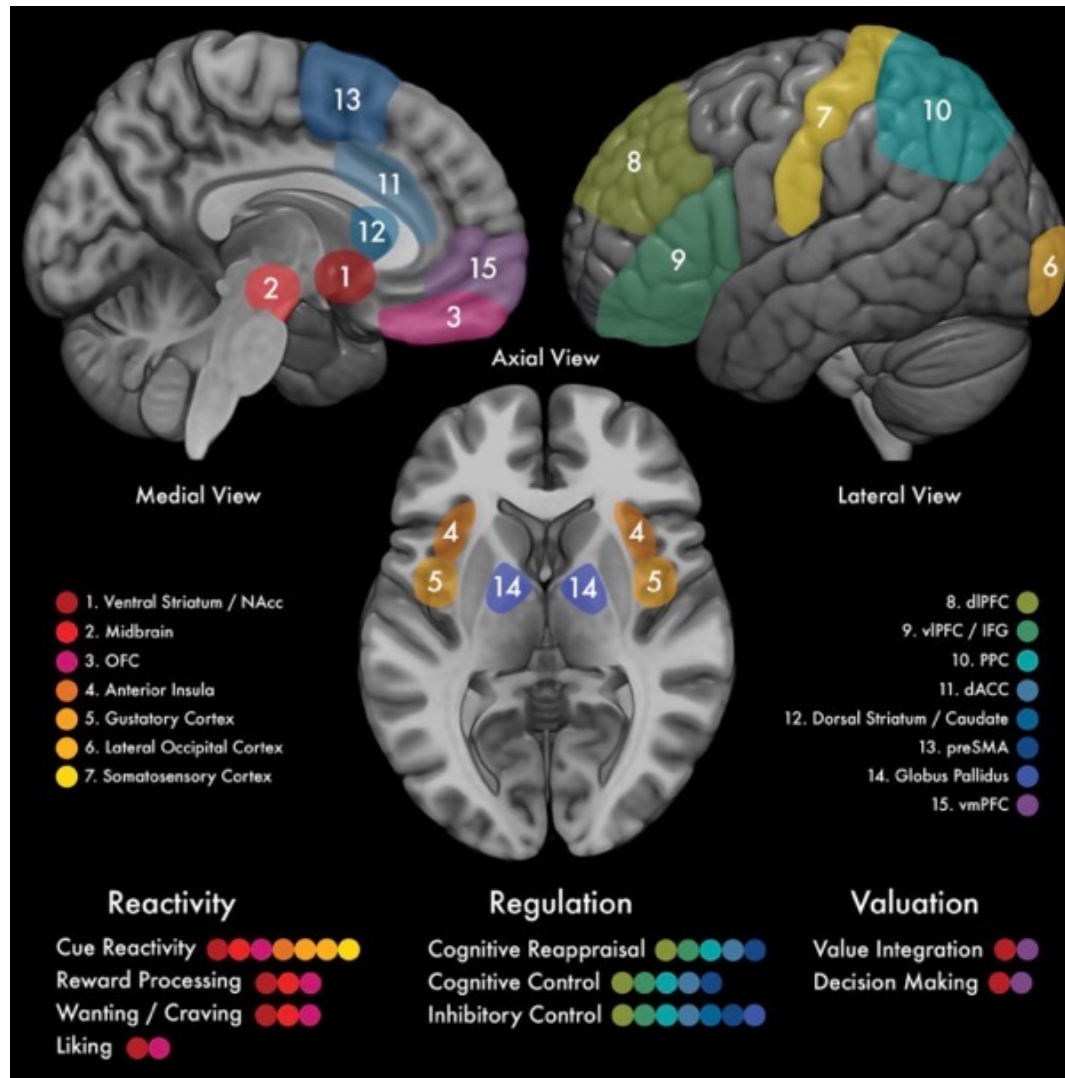
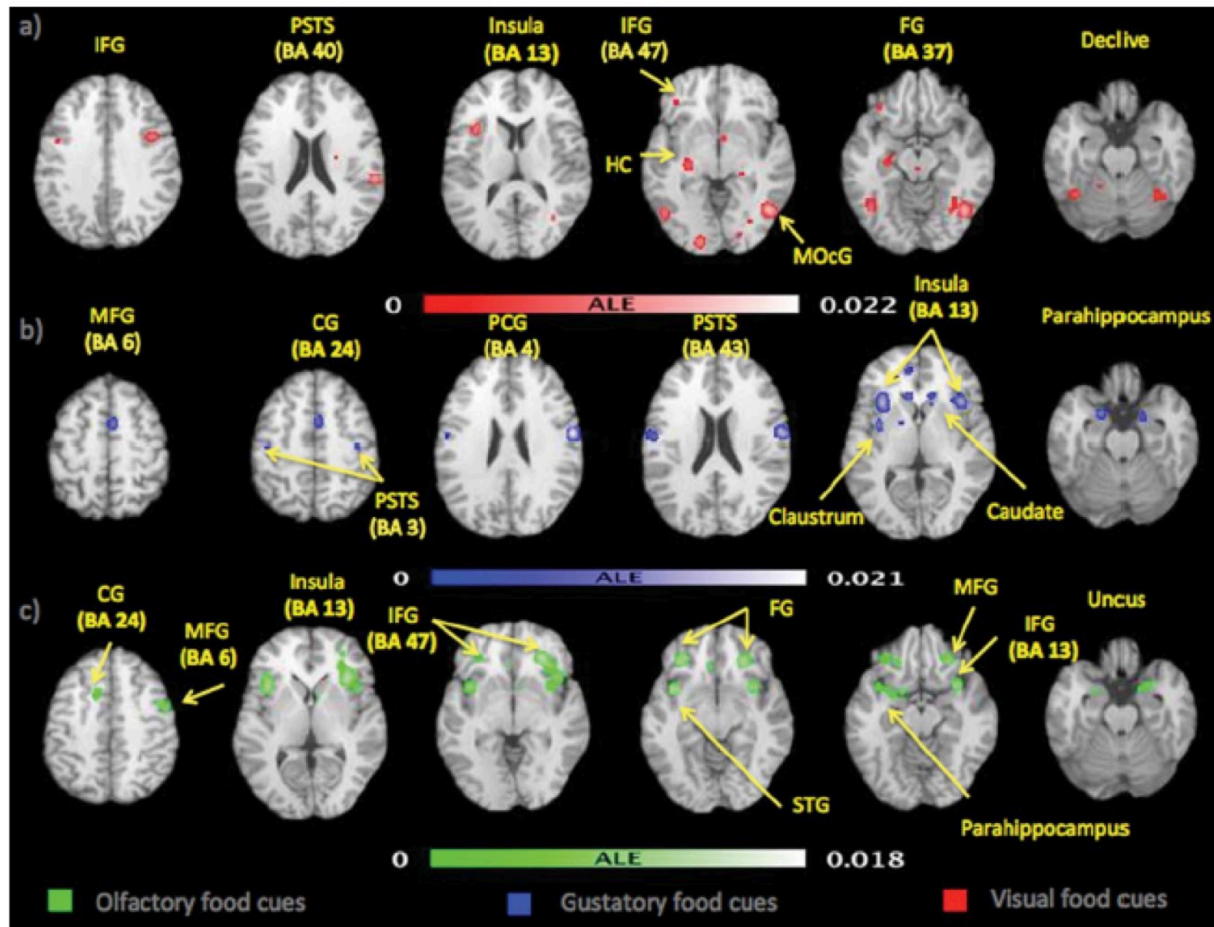


Figure readapted from Kringsbach (2015)

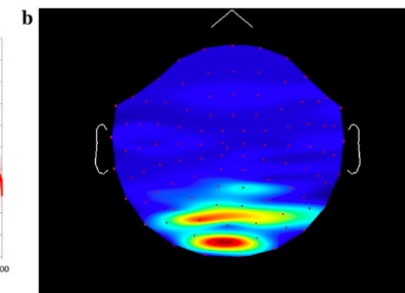
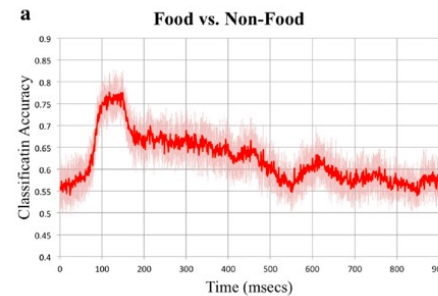
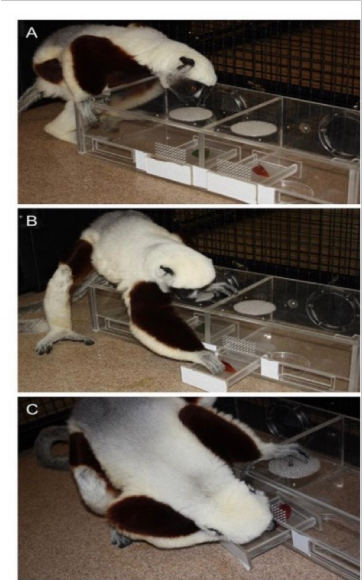


“Mangiare con gli occhi”

Meta-Analisi di studi di risonanza magnetica funzionale (fMRI) con stimoli presentati in **tre** modalità sensoriali (visione, gusto e olfatto)

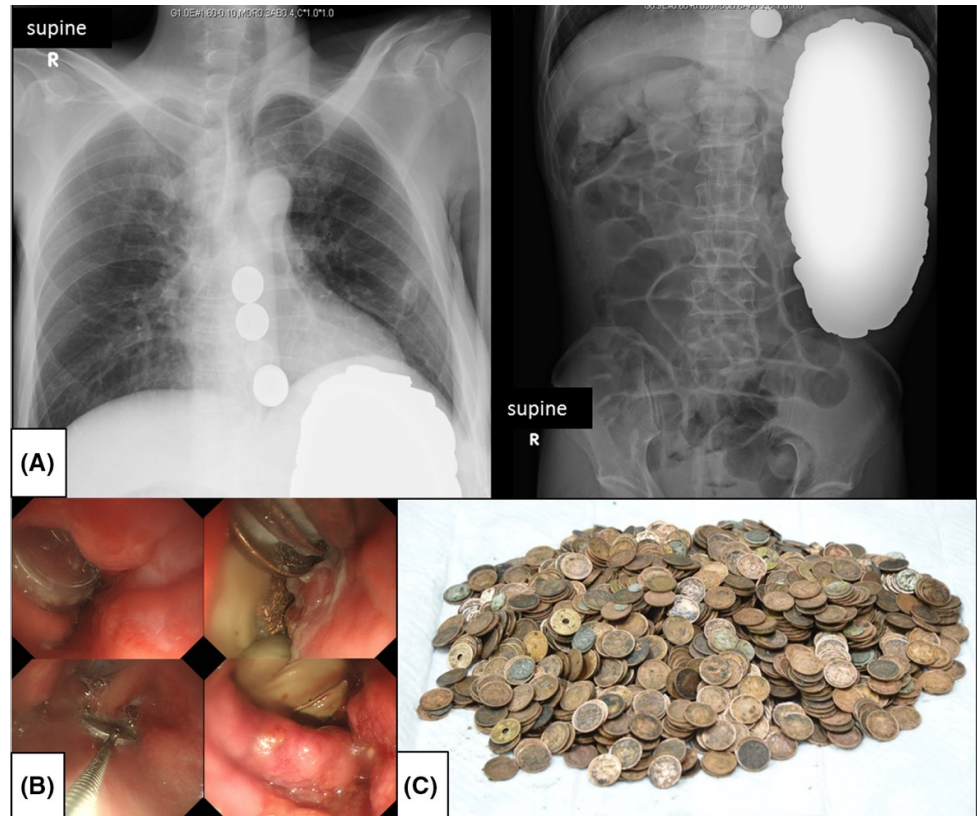


Evoluzione, cibo e cervello



Foroni et al. (2016) *Sc. Reports*; Tsourides et al., (2016) *NeuroImage*

Pica è la condizione clinica in cui individui ingeriscono sostanze **non commestibili** in varie quantità (e.g., **argilla, carta, metallo**).





Nostri antenati:













Dovevano **trovare** (*Find*) e **valutare** (*Evaluate*) i cibi nell'ambiente circostante (scarso di cibo), **escludendo** (*Excluding*) di ingerire qualcosa di velenoso ed infine **decidere** (*Decide*) quali cibi mangiare e includere nella propria dieta.

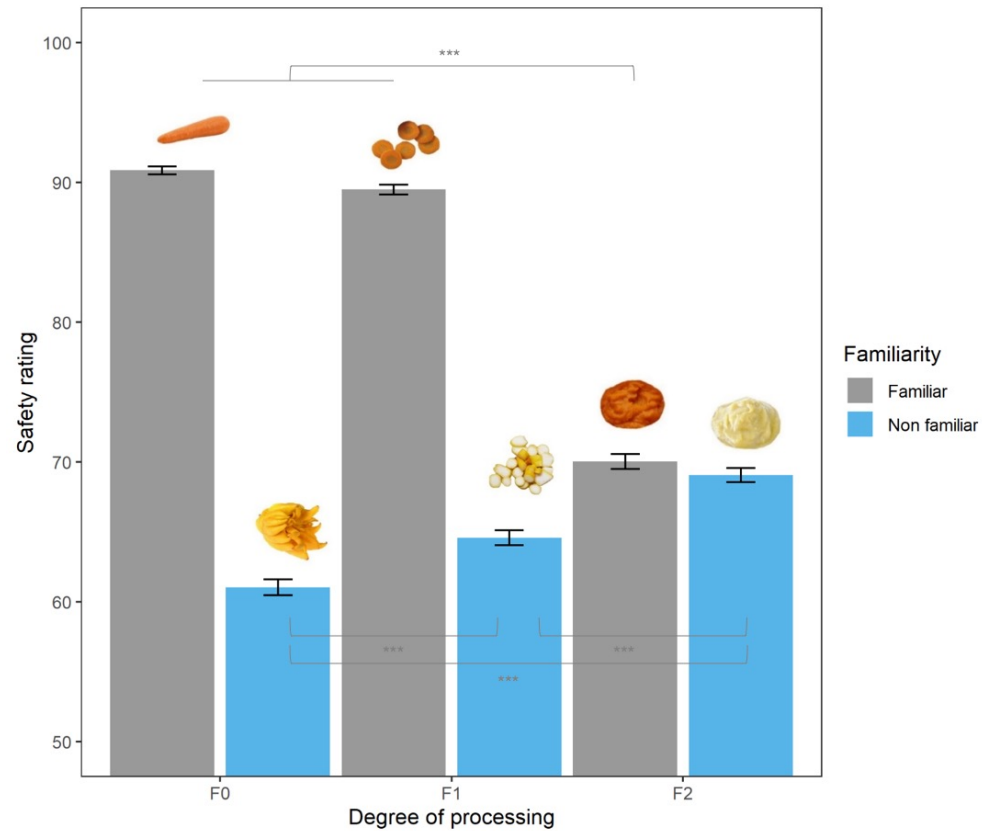
Quale impatto hanno i meccanismi del FEED framework nel nostro attuale ambiente obesogenico?





N = 123 (age M= 24.96, BMI M= 23.7)

	Familiar	Unfamiliar
Raw whole foods (Condition P0)	 	 
Raw cut foods (Condition P1)	 	 
Cooked pureed foods (Condition P2)	 	 

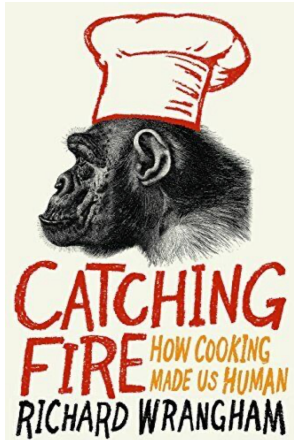


Una dieta a base di **cibi cotti**:



Prof. Richard Wrangham

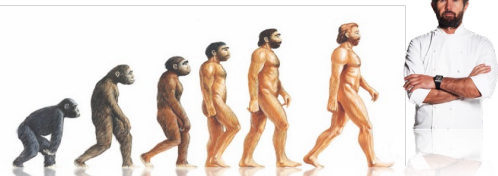
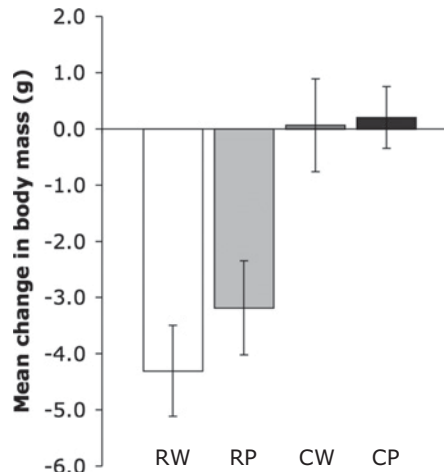
- Cambiamenti **morfologici** corpo
- Maggior guadagno netto di **energia** degli alimenti ingeriti
- Maggior tempo per altre **attività** (primati non umani: media 6-8 ore al giorno masticando cibo)
- Aumento della **palatabilità** degli alimenti e riduzione del **rischio di infezioni**



Patata dolce ad libitum per 4 giorni in diverse condizioni



Food preference task in chimpanzees

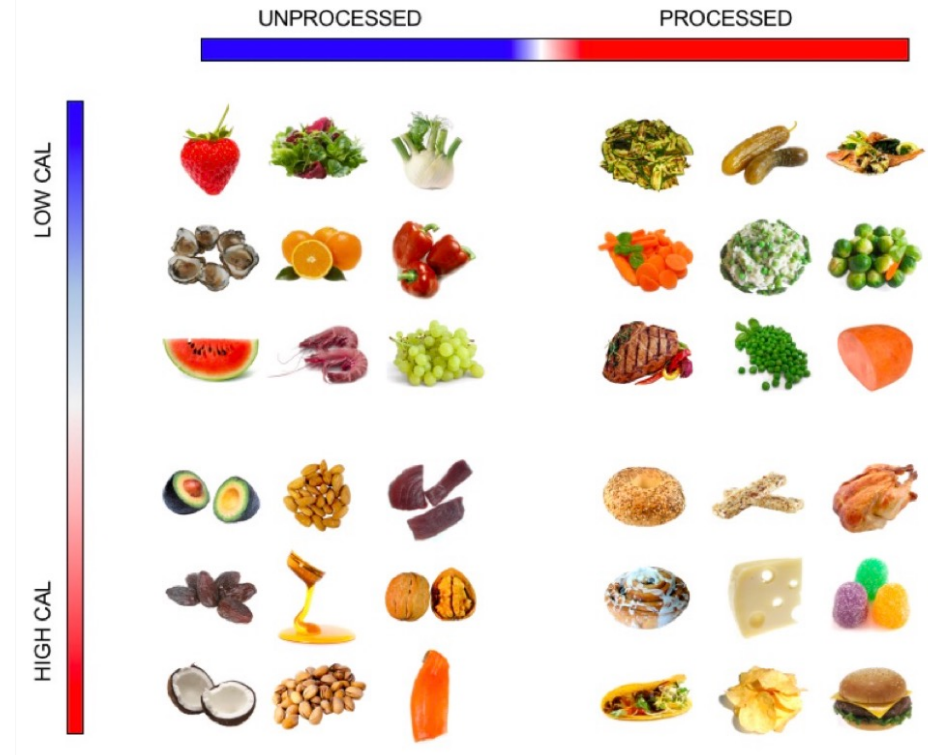
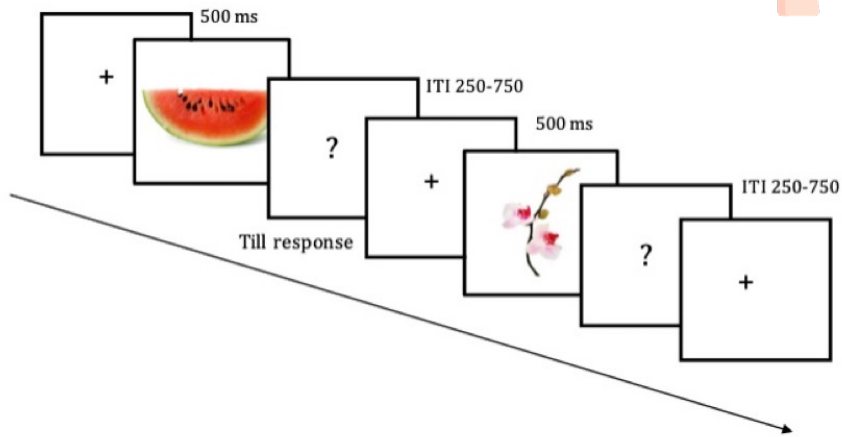
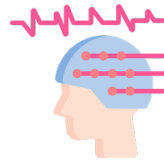


Wrangham et al., (1999; 2003);
Carmody et al. (2011); Wobber et al., (2008)

Il cervello risponde in modo distinto a cibi naturali e cibi processati?



Food/non-food categorization task

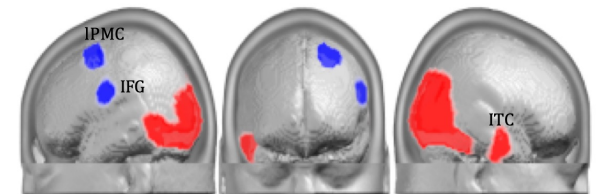


Il cervello discrimina i cibi in base al livello di processamento a partire da **130ms** dopo la presentazione dello stimolo

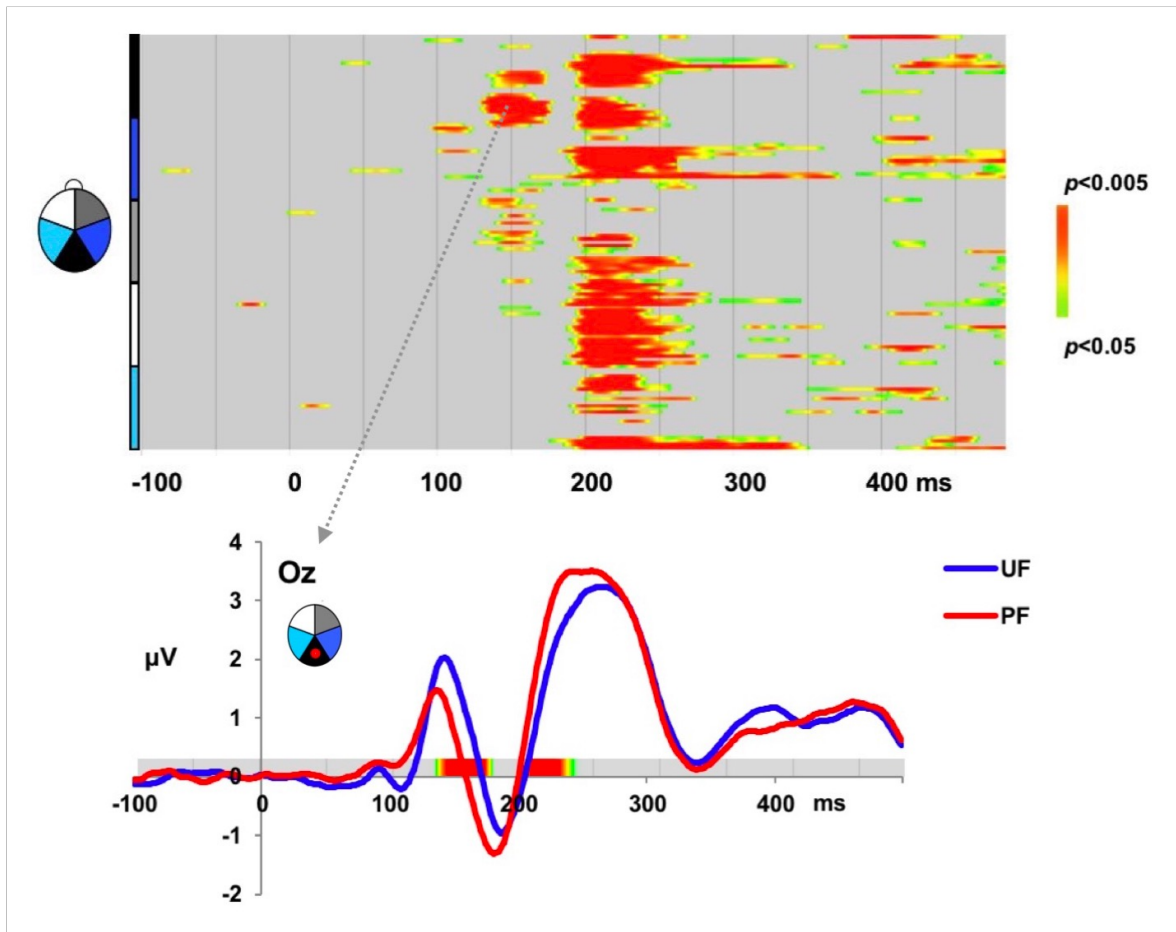
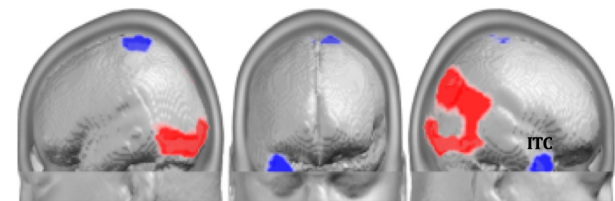


N = 20 (10 females, mean age = 24.8, mean BMI = 21.61)

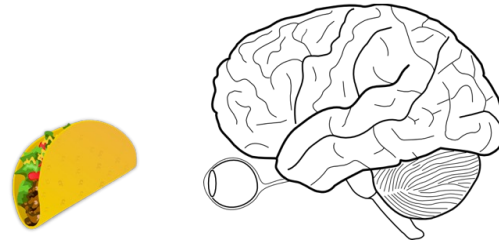
130 - 171 ms time interval



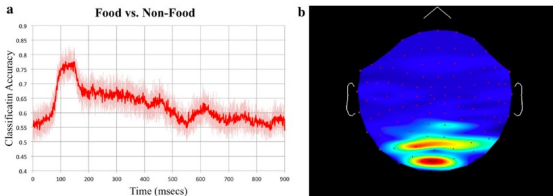
187 - 232 ms time interval



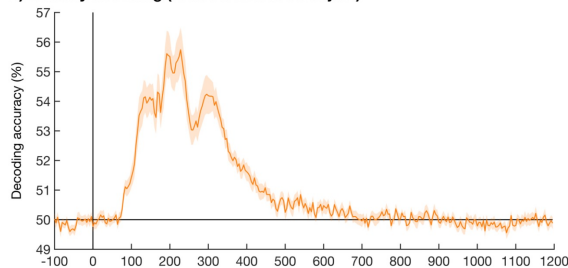
Rapida valutazione dei cibi



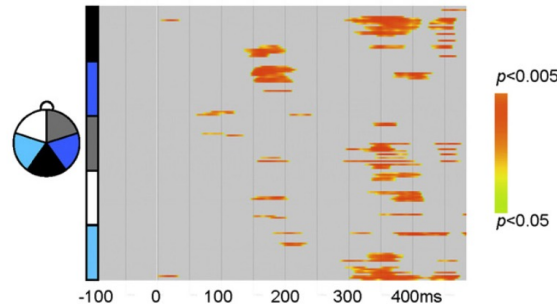
Edibility (Tsourides et al., 2016; Moerel et al., 2023)



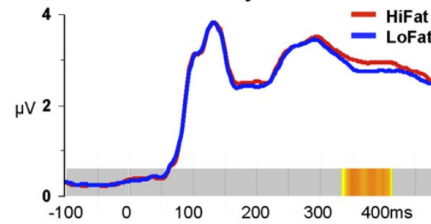
A) Edibility decoding (food vs. non-food object)



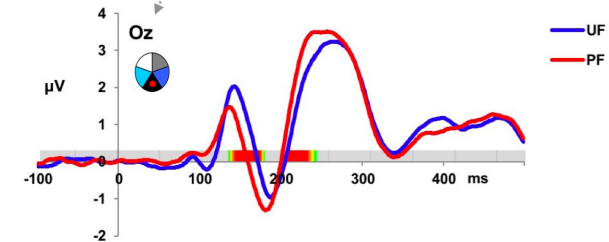
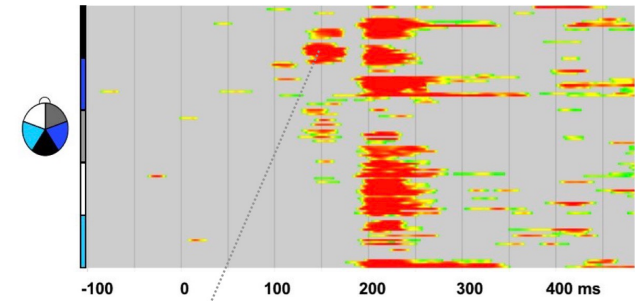
Calories/fat
(Toepel et al., 2009)

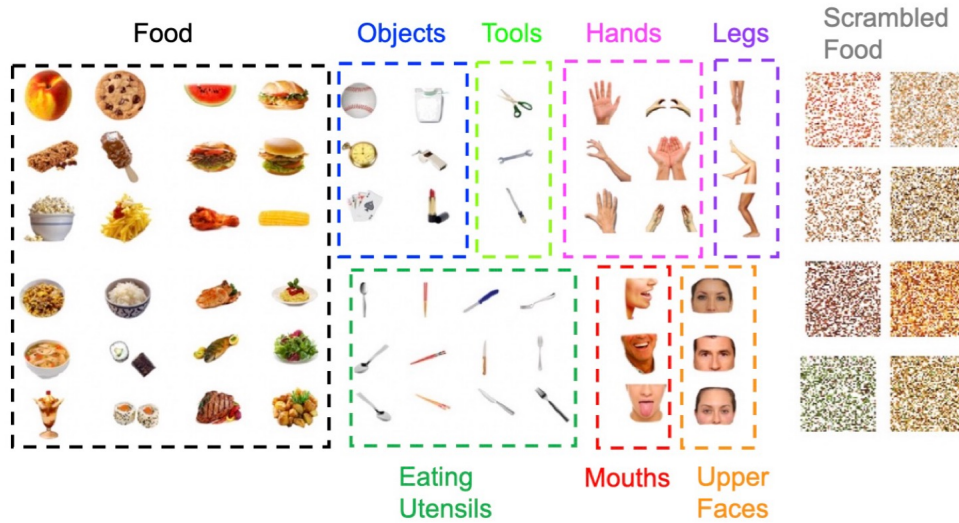


b Global Field Power Analysis



Level of processing
(Coricelli et al., 2019; Moerel et al., 2023)





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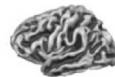
Prof. Jody Culham



SISSA

Prof. Raffaella Rumiati

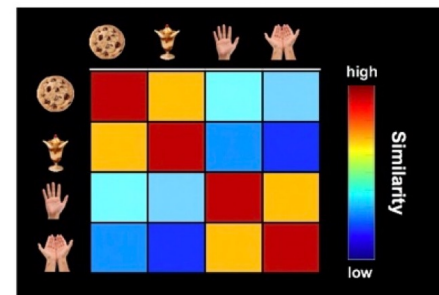
Region of Interest (ROI)



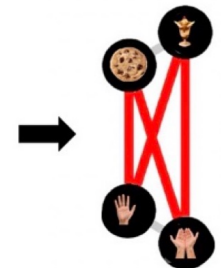
Extract activity pattern from ROI for each condition



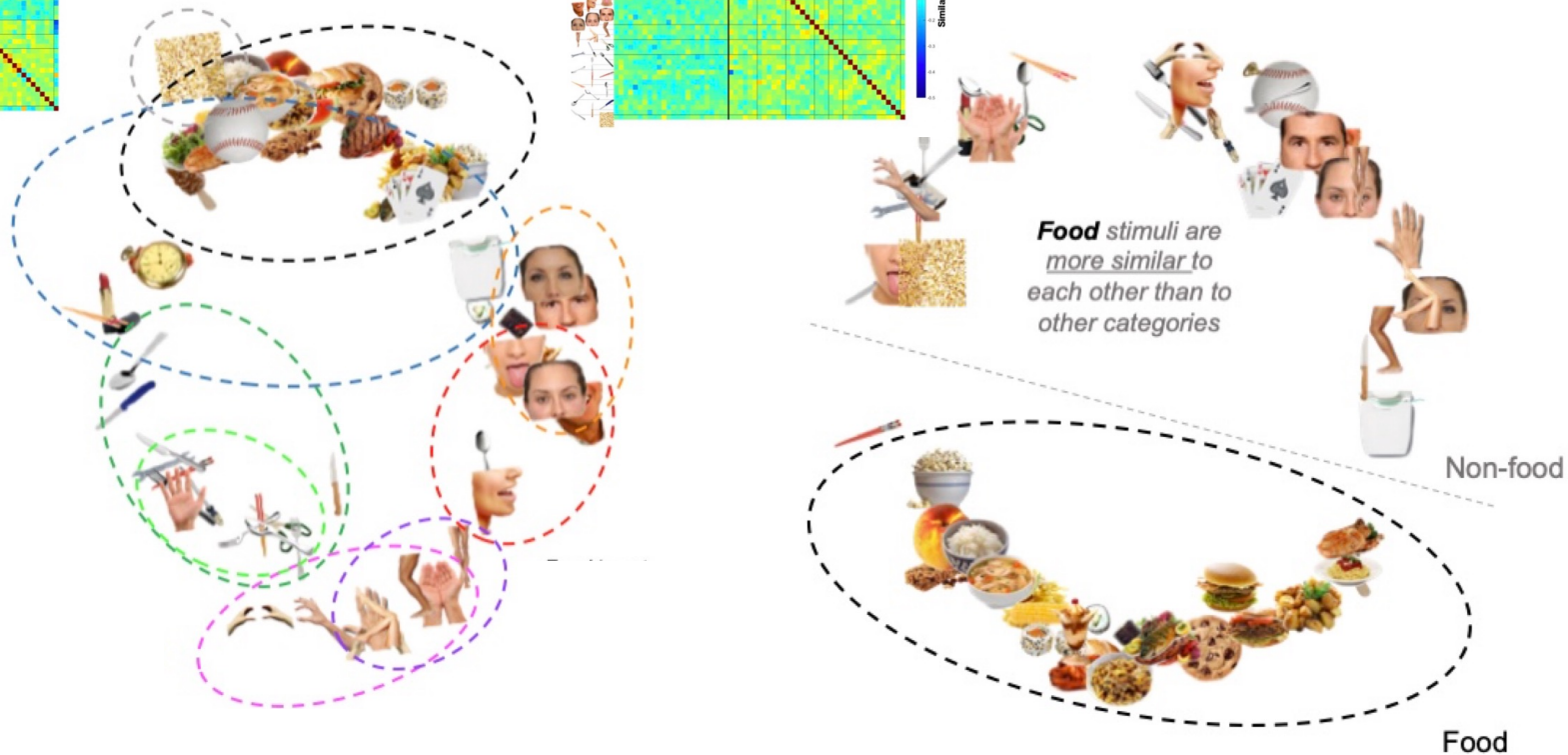
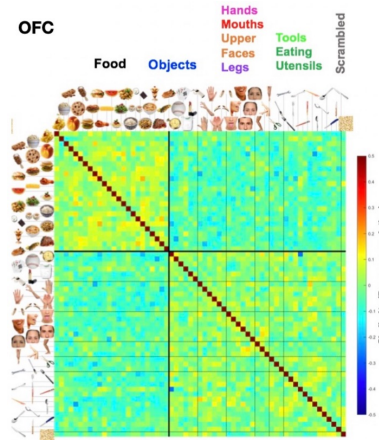
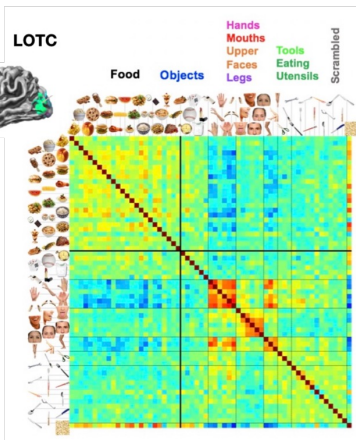
Representational Similarity Matrix (RSM)

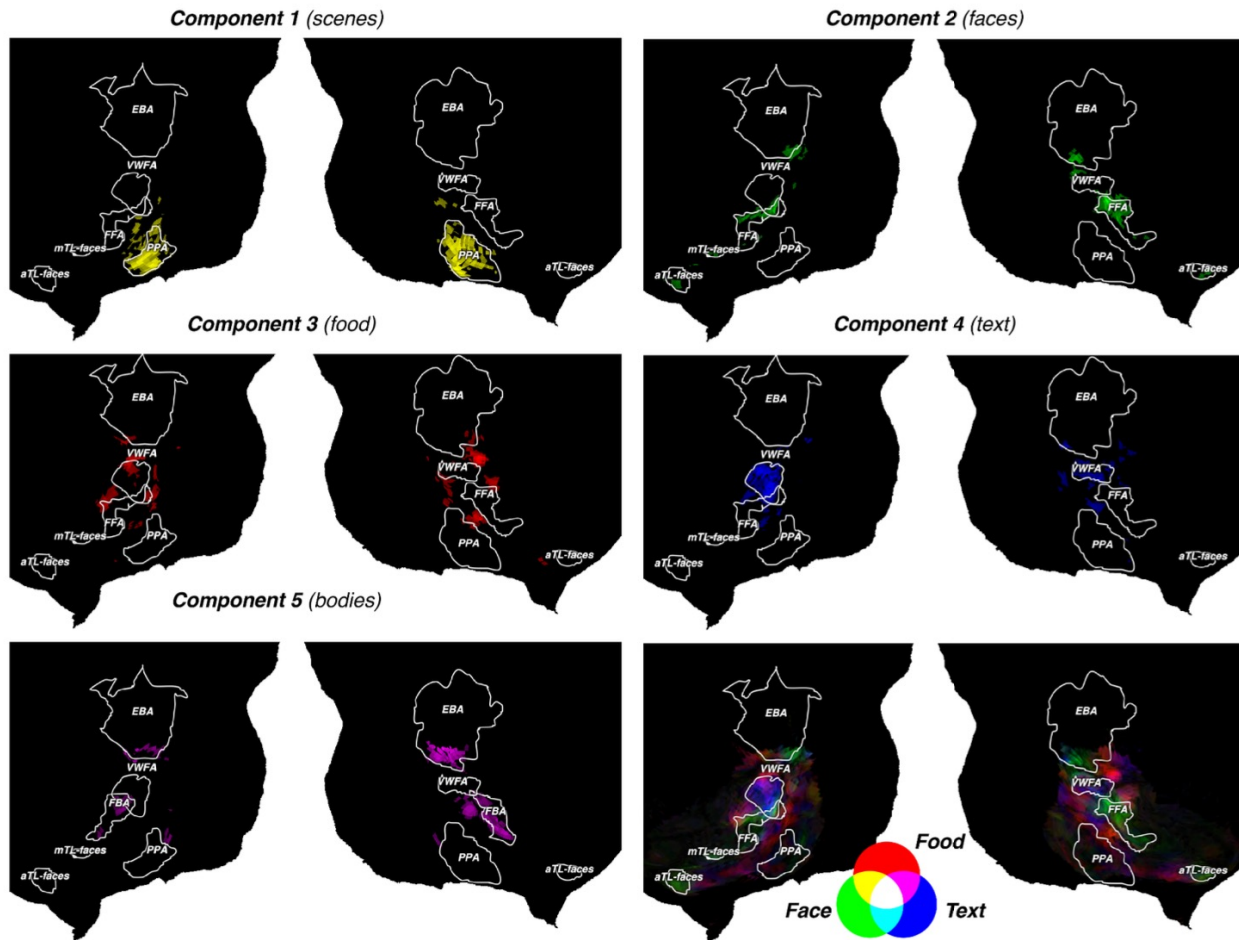


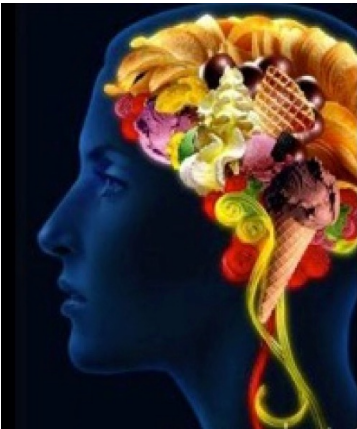
(Pearson correlation)



Multidimensional Scaling (MDS)

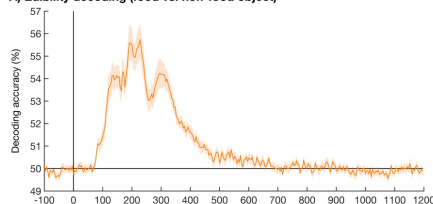






- I meccanismi cognitive alla base della nostra percezione del cibo si sono evoluti in un ambiente **scarso di cibo**
- Il cervello **rapidamente** (< 160ms) estrae informazioni riguardanti i cibi ispezionandoli visivamente
- Il cervello mostra **selettività** per il cibo nella corteccia visiva

A) Edibility decoding (food vs. non-food object)



Grazie per l'attenzione

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Libro:

Coricelli & Rossi (2021). Guida per cervelli affamati, *Il Saggiatore*

