How healthy is a food product? Neural bases of the use of nutritional information

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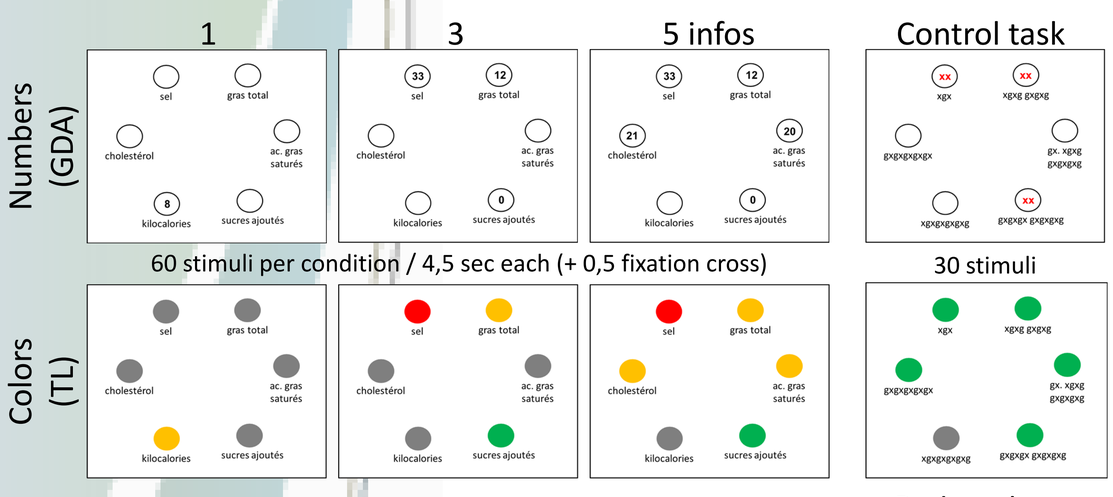
INTRODUCTION

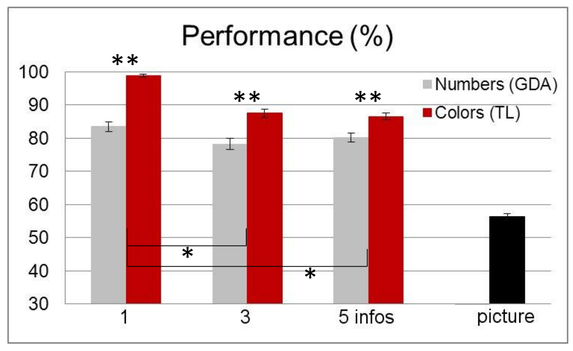
One way to improve food choice is to label food efficiently so that we understand quickly and clearly how good or bad a product is for our health. A traffic light (TL) system has been recently adopted in some countries to indicate the range of nutrients through colors, which is thought to be easier to process and to understand than numerical values, as used with the Guideline Daily Amount (GDA) system.[1,2]

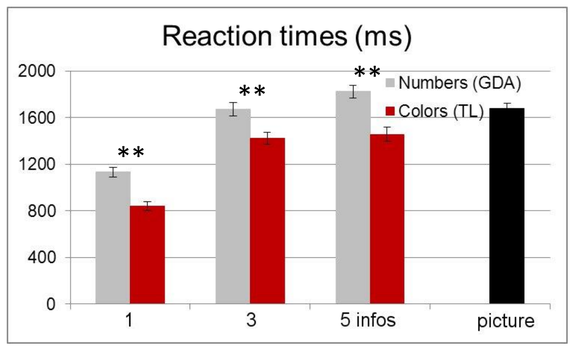
However, little is known about the cognitive processes behind the evaluation of food product from nutritional information, and their neural correlates. This experiment tested the hypothesis that TL (colors) recruit more emotional brain region than GDA (numbers).

METHODS and RESULTS



Behavioural analyses: Repeated measures ANOVA with labels (numbers vs colors) and complexity (1, 3 or 5 pieces of information) as within subject factors. Posthoc were run using paired t-test.

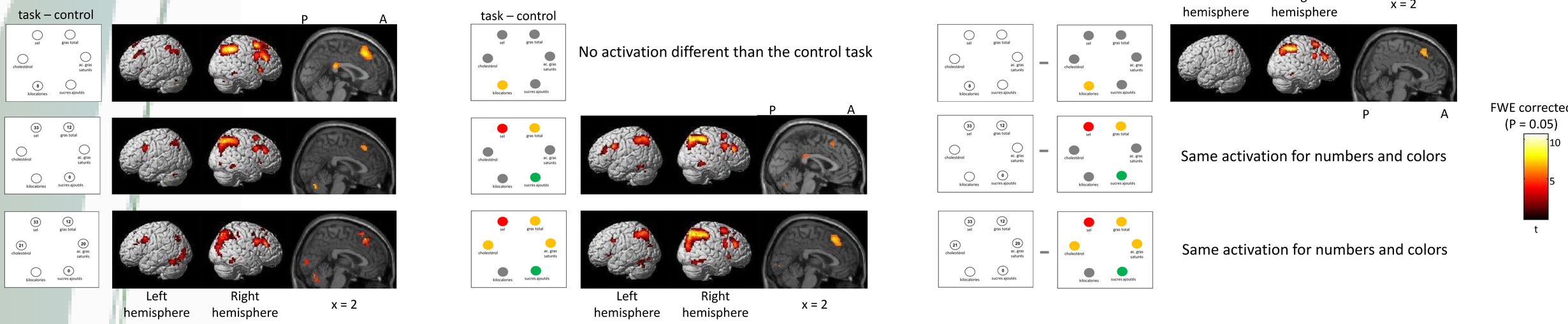


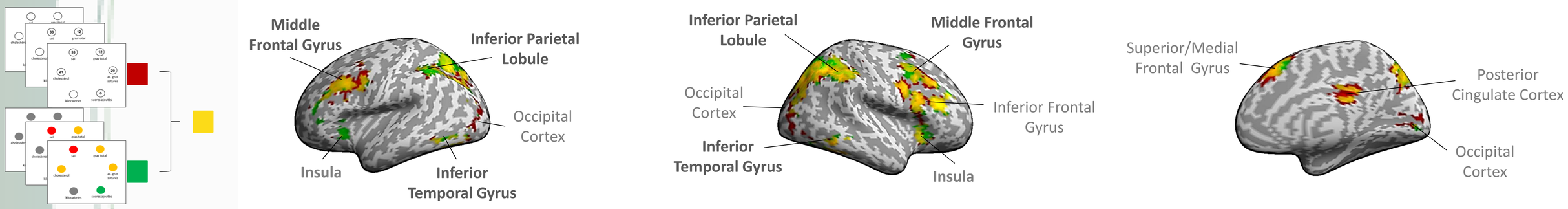


N = 48 (26 female)
Age = 26,7 (+/- 4,9)
BMI = 22,9 (+/- 3,6)

** p < 0.001
* p < 0.05

IRM 3T Phillips TR = 2,5s; TE = 30ms; voxel = 3x3x3; 44 slices; FOV = 240, 240, 132; Acquisition matrix = 80 x 79; **Imaging analyses** using SPM12





DISCUSSION

Replicating our previous study, people were better and faster when evaluating food from chromatic (TL-like) compared to numerical (GDA-like) nutritional labels, and from a single piece of information compared to 3 or more. Contrary to our hypotheses, both chromatic and numerical information activated a cerebral network underlying number processing[3] (inferior parietal lobule, middle frontal gyrus, occipito-temporal ventral cortex), suggesting that TL was as effortful to process as GDA when there was more than one piece of information, and required similar arithmetic approaches. Activation of the right inferior frontal gyrus confirmed the cognitive effort involved,[4] whereas activation of the insula confirmed that participants kept in mind the nutritional dimension of the task.[5] In conclusion, TL might not be easier to process than GDA unless there is only one piece of information.

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