Introduction
The prevalence of childhood obesity has increased dramatically all over the world. Understanding children's neural responses to food will provide insight into how to develop interventions effectively changing their eating behavior. Since brain regions involved in reward processing and decision-making are still developing throughout childhood (1), food-related brain activation in children is hypothesized to differ from that in adults. We aimed to determine the most concurrent brain regions activated in response to viewing food pictures in children, and to determine how these relate to adult findings.

Methods
fMRI studies examining the response to food images were identified using online databases. Studies were eligible if they used standardized stereotactic coordinates to report whole-brain responses for a food vs. nonfood viewing contrast and were published in a peer-reviewed journal.

Results
In children, the most concurrent clusters were in the left lateral orbitofrontal cortex (OFC; 75% of studies contributed), the bilateral fusiform gyrus, insula and amygdala and the right superior parietal lobule (37.5% of studies contributed; Figure 1A). In adults, clusters in similar areas were found (Figure 1B). In adults additional clusters were found, for example in the left ventrolateral prefrontal cortex (vPFC; 2 clusters, 13% of studies contributed). In children, the number of studies contributing to the clusters ranged between 25-75% (2-6 studies), in adults between 13-44% (2-7 studies).

Discussion
The brain areas most consistently activated by food viewing in children are part of the appetitive brain network (4) and overlap with those found in adults. Our meta-analysis in adults also yielded areas not found in children, such as the vPFC which is involved in cognitive control over appetitive regions and is among the last brain regions to mature.

Conclusion
• In response to food cues children activate areas similar to those found in adults.
• Children may not consistently activate areas important for cognitive control. However there are not enough studies in children to confirm this, therefore additional research is needed.

References
1 Casey 2000, Biological psychology.
3 http://www.brainmap.org/ale/
4 Dagher 2012, Trends in Endocrinology & Metabolism.
5 Van der Laan 2011, Neuroimage.

This work was financially supported by the European Union Seventh Framework Program (FP7/2007-2013) under grant agreement n° 266044, as part of the I.Family project (http://www.ifamilystudy.eu).

Contact: floor@isi.uu.nl