

# Children with higher genetic risk for obesity respond more strongly to fast food ads

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This is an image of a weight scale. Credit: CDC/Debora Cartagena

Dartmouth researchers have found that children with a genetic risk for obesity had greater activity in brain reward centers when watching fast food commercials, which could help us to understand why some children are more likely to overeat. The study is the first-of-its kind to examine how a key obesity gene influences brain response to food advertisements and other cues to eat. The findings are published in the *Proceedings of*

*the National Academy of Sciences.*

"By examining the still-developing [brain](#) and its reward-related structures, our findings help explain why [children](#) who are genetically at-risk for [obesity](#) may be prone to over-eating unhealthy foods," says first author, Kristina M. Rapuano, a graduate student in the Brain Imaging Lab in the department of Psychological and Brain Sciences at Dartmouth College.

Television [food](#) advertisements were used for this study to better approximate how the brain responds to food cues in the real-world, as most studies to date have shown only still images of food. Seventy-eight children ages nine to 12 years old, watched a children's television show in an MRI scanner. To simulate the experience of watching television from home, the show included 12 minutes of commercial breaks— half were advertisements for fast food and the other half for non-food items. Children were also evaluated on their [genetic risk](#) for obesity based on the fat-mass and obesity-associated (FTO) gene, which strongly predicts obesity across the lifespan. The nucleus accumbens, a region in the brain commonly associated with reward craving, was not only physically larger in children with the obesity-risk FTO genotype compared to genetically low-risk children but also showed a stronger craving response to the food commercials.

"About one-third of commercials children see on network television are food advertisements, and each one is a prompt to eat," says senior author, Diane Gilbert-Diamond, assistant professor of Epidemiology at Dartmouth's Geisel School of Medicine and member of the Norris Cotton Cancer Center. "We know from [our prior work](#) that children with this same genetic obesity risk factor are more likely to overeat after watching [food advertisements](#) on TV, even when they are not hungry. The brain scans suggest that these children may be especially vulnerable to food cues, and that limiting food advertisement exposure could be an

effective way to combat child obesity."

**More information:** Genetic risk for obesity predicts nucleus accumbens size and responsivity to real-world food cues, *PNAS*, [www.pnas.org/cgi/doi/10.1073/pnas.1605548113](http://www.pnas.org/cgi/doi/10.1073/pnas.1605548113)

Provided by Dartmouth College

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