Title: University at Buffalo Study of Nutrition and Activity in Kids (UB-SNAK)
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Hypotheses:

1) We hypothesized that sensitization to HED food is positively associated with zBMI gain over time
2) Sensitization to LED food is negatively associated with zBMI gain over time
3) Sensitization of HED and LED would interact with one another to impact zBMI change
4) The relationship between sensitization to HED food and zBMI gain is moderated by DD.

Sample Size Determination and Analytic Plan:

The sample size for this study was based on our prior studies in adults (Temple et al., 2014; Clark et al., 2010) that examined the relationship between sensitization, BMI, and weight change (effect size 0.19). We determined that, with an alpha of 0.05 and a power of 0.80, statistical significance could be achieved with a total of 180 participants.

In order to assess changes in zBMI over time and to account for missing values, we used multilevel modeling. To assess whether covariates are related to missingness, we examined baseline difference between those with complete versus incomplete data. There were no significant differences between these groups for child and parent BMI, race, sensitization, pubertal development, and food insecurity (all $p > 0.05$). We examined the scatterplots of zBMI data with each independent variable and observed that the data are linear.

To test our primary hypotheses related to zBMI change over time, appointments (level 1) were nested within individuals (level 2) and models included month of visit, sex, DEBQ score, pubertal development score and baseline zBMI as fixed effects. Our dependent measure was zBMI at baseline and 6, 15, and 24 months. We used number of months between visits as our marker of time (i.e. 6, 15, and 24). To test hypotheses related to sensitization, we categorized people as "sensitizers" (> 1) or "satiators" ($\leq$ 1) depending on their change in RRV of food from baseline to post. This threshold was chosen to account for participants who increased responding from baseline to post, even by a small amount, while allowing participants who did not change responding or who decreased responding to be considered together as satiators. To test hypothesis 1, we included HED sensitization in the model and examined interactions with time. To test hypothesis 2, we included LED sensitization in the model and examined interactions with time. To test hypothesis 3, we included both HED and LED sensitization in the model, we interacted each one individually with time, and we interacted them with each other and with time. Finally, to test hypothesis 4, we added DD as a fixed effect and interacted it with HED sensitization and visit to examine moderation.

1) Temple, J. L. Factors that influence the reinforcing value of foods and beverages. *Physiol. Behav.* **136**, 97-103, doi:10.1016/j.physbeh.2014.04.037 (2014).
2) Clark, E. N., Dewey, A. M. & Temple, J. L. Effects of daily snack food intake on food reinforcement depend on body mass index and energy density. *Am. J. Clin. Nutr.* **91**, 300-308, doi:10.3945/ajcn.2009.28632 (2010).