

# The Clean Plate Club

## Multi-Generational Impact on Child and Adult BMI

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### Background

Finishing everything on one's plate is strongly and positively correlated with Body Mass Index (BMI). This study explores the extent to which adults' clean plate tendencies are inherited from their parents and passed onto their children and their relation to BMI of adults and children.

### Methods

136 parents completed a written survey about current and past eating habits and self-reported height and weight. Heights and weights of children were measured by researchers. Correlation using SPSS 24 and mediation analyses using PROCESS model 6 were performed with children's BMI as dependent variable and grandparents who asked their children to clean plates as independent variable. Parents' BMI and parents asking their children to clean plates were used as the mediator variable (M1, M2, respectively).

### Hypothesis

H1: Cleaning plates tendencies are a multigenerational transmission process (grandparents-parents-children) that has a positive effect on children's BMI

H2: Cleaning plates tendencies' of the parents have a positive effect on children's BMI through parents' BMI

H3: Children's gender (being female) positively moderates the relationship between a parents asking their children to clean their plates and the children doing it

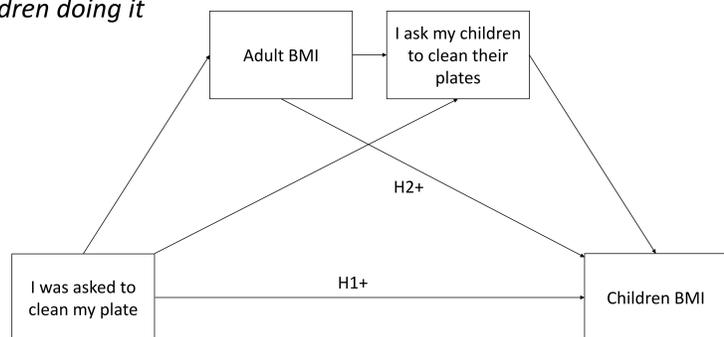


Figure 1. Conceptual mediation model and hypothesis of multi-generational clean plate behavior

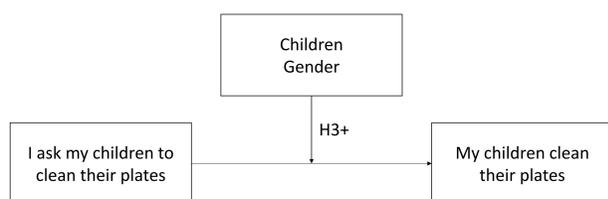


Figure 1. Conceptual model and hypothesis of gender as moderator of the clean plate club behavior

### Results

Positive correlation was found between parents who were told to clean their plates as children and their current BMI. Parents who recall their own parents insisting on clean plates did the same to their children. Mediation analysis results show a process, in which parents who were asked as children to clean their plates impacts their BMI as adults, which in turn has a positive relation with their own children's BMI. In addition, a positive relationship was found between a parent being asked to clean their plate and a parent asking their children to clean their plates. However, there is no significant relationship detected between a child asked to clean their plate and a child's BMI

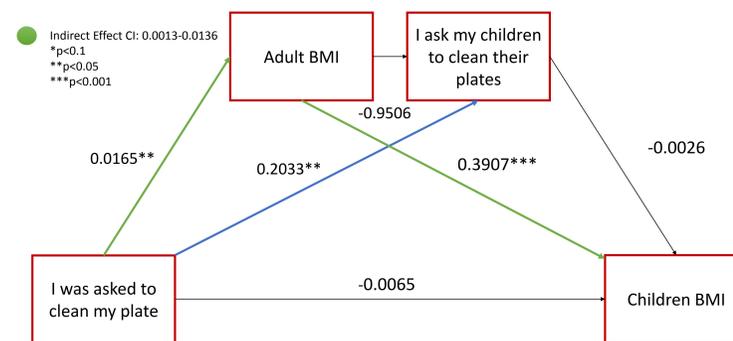


Figure 3. Moderation result for green model 1: R<sup>2</sup>.1971, p<0.001\*\*\*. Sobel p<0.05\*\*  
Note: Children BMI and Adult BMI were transformed (Ln) to better fit the assumptions

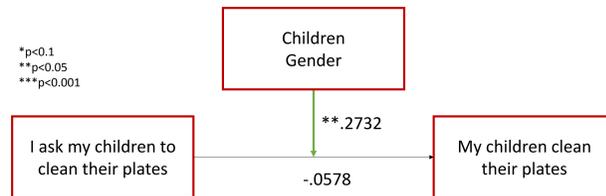


Figure 4. Moderation result for model : R<sup>2</sup>.0483, p<0.1\*.

	BMI all adults	BMI all children	BMI girls	BMI boys
<b>BMI all adults</b>		.435*** (n=136)	.365*** (n=82)	.504*** (n=54)
<b>My parents usually insisted I clean my plate</b>	.198** (n=136)	-.002 (n=136)	.288** (n=82)	.095 (n=54)
<b>I usually clean my plate at dinner</b>	-.101 (n=135)	-.170** (n=135)	-.130 (n=81)	-.055 (n=54)
<b>I often insist my child clean their plate</b>	-.045 (n=134)	-.063 (n=134)	-.114 (n=81)	0.027 (n=53)
<b>My child usually cleans their plate</b>	-.172** (n=136)	.022 (n=136)	-.251** (n=82)	-0.073 (n=54)

Note: Children BMI and Adult BMI were transformed (Ln) to better fit the assumptions

Table 1. Intergenerational Correlates of Plate Cleaning Behavior and BMI  
\* Correlation is significant at p < 0.05\*\*; p < 0.001\*\*\* (2-tailed)

### Conclusions

A vicious circle of parents having been asked as children to clean their plate can cause overweight and obesity to themselves and be transmitted to their children. Noteworthy, is the relationship of a child being asked to clean their plate and the child actually cleaning their plate, which is only significant for girls. More research is needed on plate cleaning as an adopted intergenerational trait and its relation to BMI. Nutrition education could focus on parent-child mealtime dialogue regarding eating behavior.

### Supporting Literature

Birch LL, McPhee L, Shoba B, Steinberg L, Krehbiel R. "Clean up your plate": Effects of child feeding practices on the conditioning of meal size. *Learn Motiv* 1987;18(3):301-317.  
 Birch LL, Davison KK. Family environmental factors influencing the developing behavioral controls of food intake and childhood overweight. *Pediatr Clin North Am* 2001;48(4):893-907.  
 Patrick H, Nicklas TA. A review of family and social determinants of children's eating patterns and diet quality. *J Am Coll Nutr* 2005;24(2):83-92.  
 Hill JO, Peters JC. Environmental contributions to the obesity epidemic. *Science* 1998 May 29;280(5368):1371-1374.  
 Wansink B, Payne CR. The joy of cooking too much: 70 years of calorie increases in classic recipes. *Ann Intern Med* 2009;150(4):291.  
 Wansink B, Payne CR, Chandon P. Internal and external cues of meal cessation: the French paradox redux? *Obesity* 2007;15(12):2920-2924.  
 Ferriday D, Brunstrom J. 'I just can't help myself': effects of food-cue exposure in overweight and lean individuals. *Int J Obes* 2010;35(1):142-149.  
 Herman CP, Roth DA, Polivy J. Effects of the presence of others on food intake: a normative interpretation. *Psychol Bull* 2003;129(6):873.  
 Hecker L, Martin D, Martin M. Family factors in childhood obesity. *American Journal of Family Therapy* 1986;14(3):247-253.  
 Lee Y, Mitchell DC, Smiciklas-Wright H, Birch LL. Diet quality, nutrient intake, weight status, and feeding environments of girls meeting or exceeding recommendations for total dietary fat of the American Academy of Pediatrics. *Pediatrics* 2001 Jun;107(6):E95.  
 Wansink B, Payne C, Werle C. Consequences of belonging to the "clean plate club". *Arch Pediatr Adolesc Med* 2008;162(10):994-995.



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