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Berge JM, Miller J, Watts A, Larson N, Loth KA, Neumark-Sztainer D. Intergenerational transmission of family meal patterns from adolescence to parenthood: longitudinal associations with parents' dietary intake, weight-related behaviours and psychosocial well-being. *Public Health Nutrition*. 2018;21(2):299-308.

What We Know, Think We Know, or Are Starting to Know

As we are in the field and/or practice of nutrition, it is natural that our focus is on exactly that: *nutrition*. And by 'nutrition', we mean the categories of nutrients required for optimal human function – macronutrients and micronutrients – and the related impacts on health and disease processes the balance of these nutrients in the diet have.

But it is important to remind ourselves that there is a difference between *nutrition* and *diet*. Nutrition is objective: it is defined as the process by which a living organism takes in food and utilizes the nutrients provided for growth and repair. But *diet* is subjective: it refers to the sum types of foods consumed by a person or community, and is influenced by cultural, regional, environmental, and religious factors. It is influenced by food availability, socio-economic factors, and personal preferences.

Of course, diet influences nutrition: the sum of foods included in a diet provide the nutrients which influence health status. But nutrition, in its purest definition, is simple; diet is complicated. And over the past 50-years, there has been a seismic shift in the complex interrelationship of socioeconomic, cultural, and environmental changes influencing diet at a societal and individual level ^(1,2).

Determinants of diet in the population have included increased energy in the food supply, social disparity in health-promoting dietary behaviours, increased consumption of energy-dense foods, increased proportion of energy from snacks, saturation of lower SES areas with fast-food outlets, increased consumption of energy outside the home, changes in the living environment, and bio-psycho-social determinants of energy intake ⁽³⁻⁸⁾.

Within this complex interrelationship of determinants of diet, within-home factors, including parental activity, may be relevant in influencing dietary intake in dependant children ⁽⁹⁾. This may be relevant to factors like family meals. For example, a recent systematic review of the literature by Fulkerson *et al.* examining the frequency of family meals and dietary or weight outcomes concluded that there were overall positive associations between family meal frequency and diet quality amongst children and adolescents ⁽¹⁰⁾. But are positive associations sustained when kids grow up? The present study looked at this question.

The Study

The Eating and Activity in Adolescents and Young Adults Project [Project EAT] is a longitudinal study of factors associated with dietary intake, physical activity, weight control behaviours, and weight status, in young people. The study encompasses the initial EAT-I in 1998-99, and three follow-up periods at 5yr intervals: EAT-II in 2003-04, EAT-III in 2008-09, and EAT-IV in 2015-16.

At baseline in EAT-I, 4,746 participants completed surveys on diet and anthropometric measures. At the EAT-IV, 726 participants who had become parents and 618 participants who were cohabiting with a partner but not parents, completed a further follow-up survey.

The primary hypothesis was that children who had regular family meals at EAT-I would carry forward [i.e., intergenerational transition] the behaviour as parents with their own children, and which would be associated with better diet quality and weight-related behaviours compared to young adults who did not regularly have family meals as adolescents.

“Regular family meals” was defined as all or most of the household eating meals together >5 times per week. To compare the baseline to follow-up, participants were divided into four categories based on the meal frequency responses:

- “Maintainers”: Those who reported >5/week family meals at both baseline and 15yrs later;
- “Stoppers”: Those who reported >5/week family meals at baseline but not 15yrs later;
- “Starters”: Those who did not report >5/week family meals at baseline but did 15yrs later;
- “Nevers”: Those who did not report >5/week family meals either at baseline or 15yrs later.

Results: Among young adult parents, sex, ethnicity, socio-economic status, and number of children living in the household were not correlated with changes in family meal frequency between baseline and follow-up. However, both Starters and Maintainers correlated with having younger children, a younger age of the parents, and were more likely to have had parents who themselves were married.

- **Dietary Associations:** There were no significant associations between family meal patterns and either fruit and vegetable intake or sugar-sweetened beverage intakes in young adult parents. However, compared to the Never category, adult parents in the Starter category, i.e., who started having regular family meals after becoming parents, had significantly less likelihood of fast-food meal intake. Similarly, adult parents in the Maintainers category, i.e., those who had regular meals as adolescents and continued regular family meals after becoming parents, were also significantly less likely to consume fast-food meals.

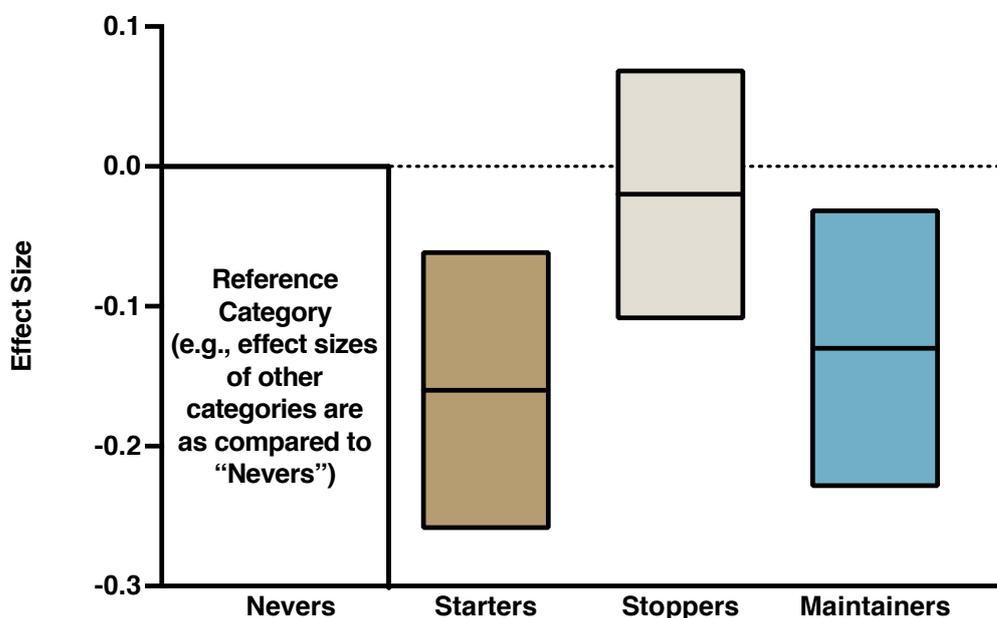


Figure illustrating the fast-food associations between the “Starters”, “Stoppers”, and “Maintainers” categories. For this analysis, the “Nevers” category was the reference category. A reference group or category in an analysis like this, which was a linear regression, is the category against which the other categories in the analysis are compared. Therefore, the differences here should be read as, for example, “Maintainers” vs. “Nevers”, and so on. The 0.0 line represents “Nevers”, and no difference between groups. In each box, the horizontal line is the effect estimate, and the top and bottom of the box are the 95% confidence intervals.

- Unhealthy Weight-Control Behaviours:** Compared to the Never category, adult Maintainers who continued to have regular family meals as parents engaged in significantly less unhealthy weight-control behaviours. Similarly, adult “Starters” who began having regular family meals as parents were also significantly less likely to engage in unhealthy weight-control behaviours.

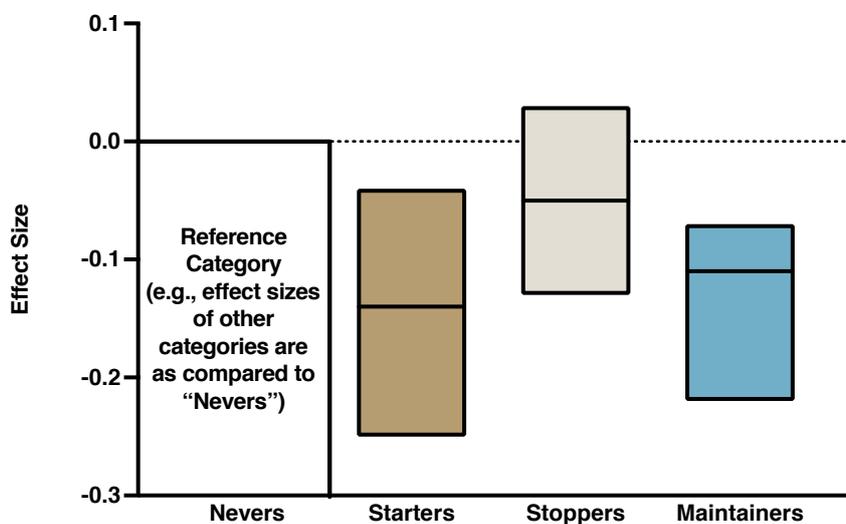


Figure illustrating the associations for unhealthy weight-control behaviours between the “Starters”, “Stoppers”, and “Maintainers” categories compared to the “Nevers” category as the reference category. In each box, the horizontal line is the effect estimate, and the top and bottom of the box are the 95% confidence intervals.

- Binge Eating:** Compared to the Never category, adult Maintainers and Starters who continued to have regular family meals or began to have regular family meals as parents, respectively, had an ~50% lower relative risk of binge eating in significantly less binge eating.

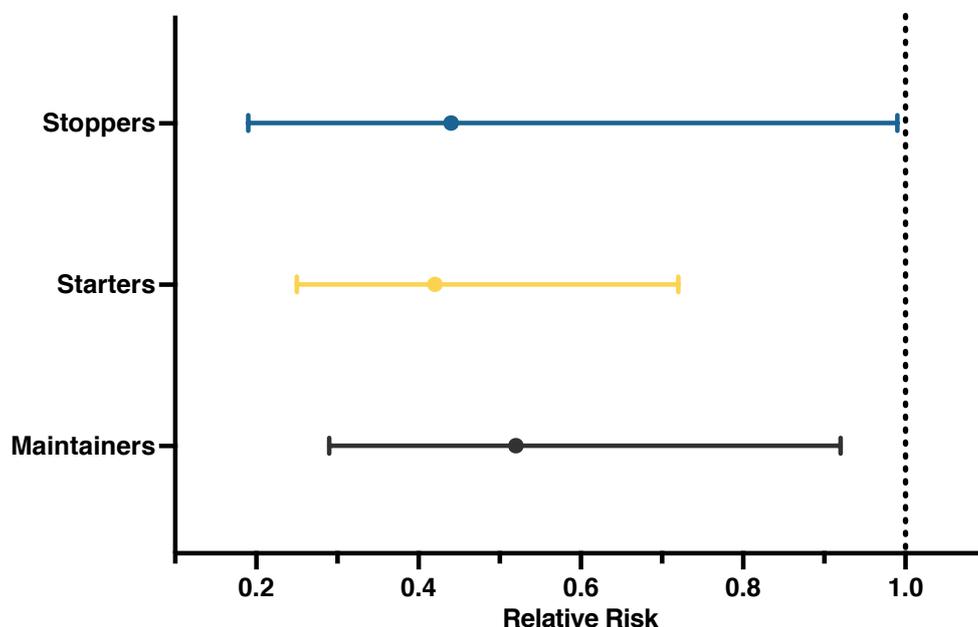
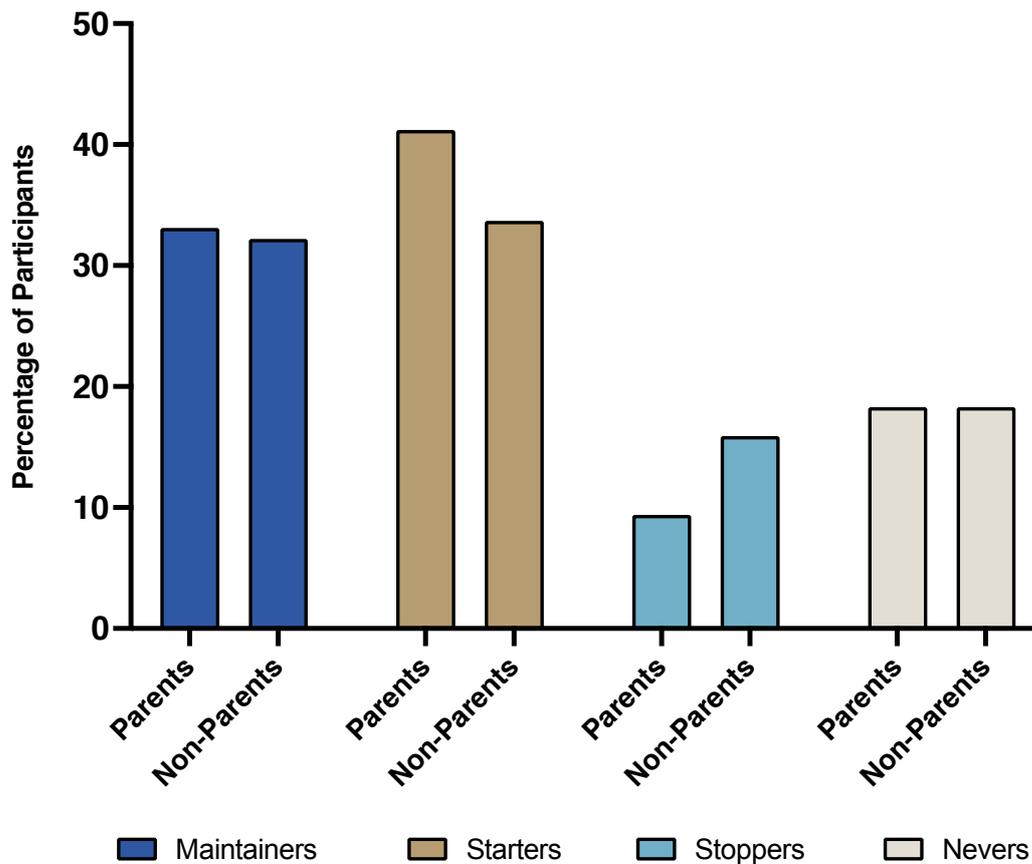


Figure illustrating the relative risk for binge eating in each category of “Starters”, “Stoppers”, and “Maintainers” categories compared to the “Nevers” category as the reference category.

- **Psychosocial Factors:** Compared to the Never category, adult Maintainers and Starters who continued to have regular family meals or began to have regular family meals as parents, respectively, had a significantly lower depressive symptoms increased self-esteem.
- **Adult Parents vs. Non-Parents:** Among the Starters category, i.e., those who did not have regular family meals as adolescents, 41.2% of parents were more likely to be Starters of regular family meals compared to 33.7% of non-parent young adults. In the Stoppers category, i.e., those who had regular family meals as adolescents and stopped in young adulthood, 9.4% of parents were likely to have stopped regular family meals compared to 15.9% of non-parent young adults. The **figure** below illustrates these differences among categories.



The Critical Breakdown

Pros: The Project EAT cohort has the advantage of repeated measures of dietary assessment, dietary behavioural assessments, and anthropometrics, over time with up to 15yrs of follow-up. The major strength of this study is therefore the ability to examine family meal patterns in adolescents and again in young adulthood, to determine changes over time. The study cohort has a slightly more diverse ethnic and socio-economic demographic among participants in comparison with other U.S. cohorts. The analysis adjusted for multiple relevant potential covariates, including marital status, ages of children in the household, and baseline measurements of relevant outcomes.

Cons: As is a risk with longer-term studies, there were substantially less numbers of participants available for follow-up analysis at EAT-IV compared to the baseline assessments at EAT-I. Thus, the sample size on which repeated measures were available is small, and could potentially give rise to some selection bias [e.g., more motivated participants with a higher socio-economic profile and health behaviours]. It would have been useful if the meal label was provided, i.e., ‘breakfast’ or ‘dinner’, given these may potentially have differential associations for family meals regarding diet quality or related behavioural outcomes.

Key Characteristic

One characteristic to bear in mind in relation to the results outlined above is that depending on what the outcome was, the analyses differed in how the results were presented. For example, the analysis for fast-food intake and unhealthy weight-control behaviours were expressed as an *effect* size [with 95% CI], while the analysis for binge eating was expressed as something more familiar to you: *relative* risk [with 95% CI].

So, how might you interpret effect sizes in an analysis like this? Let’s take the effect size for fast food consumption in “Maintainers” was -0.13 , compared to the “Nevers” category. In this context, this is the average difference in weekly fast-food servings between the “Nevers” category and the “Maintainers”. While the value of -0.13 may seem small, it is important to note that results from this type of analysis [known as “standardised beta coefficients”] are expressed as *standard* deviation.

When you have very different variables – fruit and vegetable intake and unhealthy weight-control behaviours, for example, which are assessed using different scales and instruments. Expressing results as effect sizes in this way is helpful because they are *standardised*, i.e., they allow for easy comparison of the relative importance of each variable in the analysis. Which leads us to the **Interesting Finding**...

Interesting Finding

In this study, we can see that, starting to regularly consume family meals as a young adult parent had slightly more effect on reducing fast-food intake compared to those who maintained family meal regularity from adolescence to young adulthood, however, the differences between these groups were largely equivalent.

Compared to the “Stoppers” category, i.e., those that did consume regular family meals in adolescence but stopped in young adulthood, the “Starters” and “Maintainers” both had much larger effects associated with less weekly fast-food and less engaging in unhealthy weight-control behaviours.

What might the differences in these categories tell us? The first inference is that regular family meals in adolescence may not be ‘preventative’ *per se*, i.e., to cease the behaviour in young adulthood does not necessarily mean that the benefits of the adolescence exposure remain for better dietary and related behaviours.

Conversely, the fact that the “Starters” category was associated with practically equivalent effects to the “Maintainers” across all the relevant outcomes, whether dietary or behavioural, is instructive. Perhaps the consumption of regular family meals at *any* point is associated with improved diet and diet-related behaviours.

It may be that being exposed to regular family meals in adolescence is necessarily a barrier, and this appears to have been born out in the data: 41.% of parents were likely to be “Starters”, while non-parents were more likely to be “Stoppers”. Thus, perhaps the intervening act is that of becoming a parent, which may bring more impetus to parents to adopt regular family meals.

Relevance

The EAT Project is one of the first cohorts to investigate the association between diet and diet-related behaviours prospectively, and in a population that were teens at baseline, and between ~30yrs of age on average in the present study at follow-up. The prospective design provided important insight into the time-course relationship between eating behaviours in adolescence, an age group which has seen substantial socio-demographic changes in dietary intake over the past 50yrs.

For example, Barry Popkin’s research of trends in U.S. dietary intake from the late 1970’s showed that, up to 2006, energy intake away from the home in children increased from 23.4% to 33.9%, an average increase of ~250kcal per day⁽¹¹⁾. This also corresponded with an overall decrease in food preparation within the home⁽³⁾. And it is important to note that the Project EAT group, in another analysis, showed that adolescents from the lowest socio-economic group showed the greatest decline in weekly family meals⁽¹²⁾. It is also possible that lack of frequent family meals serves as a proxy for food insecurity⁽¹³⁾.

As stated at the outset, this is a complex interplay of various socio-economic-environmental factors. The question is, to what extent are regular family meals in childhood and adolescence protective over time? Wider research suggests a number of potential benefits beyond diet, including improved psychosocial wellbeing, less disordered eating, and less substance abuse^(13,14). Indeed, the improved psychosocial wellbeing was observed in the present study.

What may mediate these associations? Let's bring the human voice into this, from some qualitative data from Project EAT which characterised family meals according to four themes: early childhood experiences, influence of partner, household skills, and family priorities ⁽¹⁵⁾. In this analysis, the majority of “Maintainers” had positive memories of family meals from childhood. Here is a quote from a participant in the “Maintainers” category in relation to early childhood experiences:

“I mean, I always really enjoyed that time of like sit down and conversation, and my dad would even quiz me on like math problems, so it was kind of like an interactive time. I wouldn't say it was chaotic by any means. It was definitely like a sit-down meal, and that, to me, growing up I think was a huge — I mean, if I remember it so vividly, I would call it a pretty impactful moment, so that's kind of the same moments we're trying to carry forward to my kids as well.” (Father)

And here is a quote from a participant in the “Starters” category, in relation to the influence of their partner:

“They [husband's family] always had a really strong family base and doing — like they'd always eat together, and wash the dishes after meals. That was always their big thing. And so we (my husband and I) kind of brought that into our home and helping out afterwards and washing dishes and having the family environment is important to us.” (Mother)

“Starters” often expressed the desire to “do things differently” from their own families ⁽¹⁵⁾.

Application to Practice

We often hear tropes about diet and nutrition being about “more than food”, but cheesy non-diet rhetoric aside, there is a kernel of truth at the core of this statement. Ultimately, diet is a behaviour, and behaviours are influenced by multiple inputs from our environment, including the environment in which we are conditioned.

The qualitative data indicates that “Maintainers” have a range of supporting behaviours in place; positive early childhood experience and desire to maintain the tradition, partners with shared childhood experiences, and one or both partners having cooking skills ⁽¹⁵⁾. Conversely, “Starters” reported having more barriers to overcome, e.g., having to acquire cooking skills ⁽¹⁵⁾. Thus, like many of the socio-economic factors leading into nutrition, it is important to meet people where they are at, and in the context of their life experiences.

This is very nascent area of research, and most of the research to date is cross-sectional studies. The Project EAT cohort continues to provide highly valuable research on the influence of various diet-related behaviours in adolescences may influence dietary intake and other behaviours later in young adulthood. To date, the majority of the research shows a net positive to family meal frequency during adolescence on future behaviours, albeit the impact on diet specifically may be small and it could be that wider behavioural correlates of eating behaviour and psychosocial factors are impacted to a more meaningful degree.

References

1. The Foresight Group. 2017 Report.
2. The Marmot Review. Fair Society, Healthy Lives. London; 2010.
3. Smith LP, Ng SW, Popkin BM. Trends in US home food preparation and consumption: analysis of national nutrition surveys and time use studies from 1965–1966 to 2007–2008. *Nutrition Journal*. 2013 Dec 11;12(1):45.
4. Piernas C, Popkin BM. Snacking Increased among U.S. Adults between 1977 and 2006. *The Journal of Nutrition*. 2010 Feb 1;140(2):325–32.
5. Hough G, Sosa M. Food choice in low income populations – A review. *Food Quality and Preference*. 2015 Mar;40:334–42.
6. Black C, Moon G, Baird J. Dietary inequalities: What is the evidence for the effect of the neighbourhood food environment? *Health & Place*. 2014 May;27:229–42.
7. Cooksey-Stowers K, Schwartz M, Brownell K. Food Swamps Predict Obesity Rates Better Than Food Deserts in the United States. *International Journal of Environmental Research and Public Health*. 2017 Nov 14;14(11):1366.
8. Swinburn B, Sacks G, Ravussin E. Increased food energy supply is more than sufficient to explain the US epidemic of obesity. *The American Journal of Clinical Nutrition*. 2009 Dec 1;90(6):1453–6.
9. Olds TS, Maher CA, Matricciani L. Sleep duration or bedtime? Exploring the relationship between sleep habits and weight status and activity patterns. *Sleep*. 2011;34(10):1299–307.
10. Fulkerson JA, Larson N, Horning M, Neumark-Sztainer D. A review of associations between family or shared meal frequency and dietary and weight status outcomes across the lifespan. *Journal of Nutrition Education and Behavior*. 2014;46(1):2–19.
11. Poti JM, Popkin BM. Trends in Energy Intake among US Children by Eating Location and Food Source, 1977-2006. *J Am Diet Assoc*. 2011 Aug;111(8):1156–64.
12. Neumark-Sztainer D, Wall M, Fulkerson JA, Larson N. Changes in the Frequency of Family Meals From 1999 to 2010 in the Homes of Adolescents: Trends by Sociodemographic Characteristics. *Journal of Adolescent Health*. 2013 Feb;52(2):201–6.
13. Fulkerson JA, Kubik MY, Story M, Lytle L, Arcan C. Are There Nutritional and Other Benefits Associated with Family Meals Among At-Risk Youth? *Journal of Adolescent Health*. 2009 Oct;45(4):389–95.
14. Eisenberg ME, Olson RE, Neumark-Sztainer D, Story M, Bearinger LH. Correlations Between Family Meals and Psychosocial Well-being Among Adolescents. *Archives of Pediatrics & Adolescent Medicine*. 2004 Aug 1;158(8):792.
15. Loth KA, Uy MJA, Winkler MR, Neumark-Sztainer D, Fisher JO, Berge JM. The intergenerational transmission of family meal practices: a mixed-methods study of parents of young children. *Public Health Nutrition*. 2019 Feb 8;1–12.