Popular discourse has long emphasized the importance and value of family meal times, and the ritual of a family sitting down together to share the evening meal in particular has become integral to an idealized vision of health family functioning. A relatively large body of academic work has affirmed the value of family meals and of shared family dinners in particular to child outcomes. For example, in the forward of the fifth edition of its report on family dinners, the National Center on Addiction and Substance Abuse at Columbia University ([CASA], 2009) wrote, "More than a decade of research at [CASA] has consistently found that the more children have dinner with their parents, the less likely they are to smoke, drink or use drugs. Simply put: Dinner makes a difference" (p.i). Similarly, the Council of Economic Advisors to President Clinton were sufficiently convinced by results from analyses using data from the National Longitudinal Survey of Adolescent Health (Add-Health) to conclude that "teens who continue to connect with their parents by eating dinner with their family…fare better" (U.S. Council of Economic Advisors, 2000, p.22).

And yet, much of the previous literature on the relationship between family meal frequency (FMF) and child outcomes has been limited. A recent review of the impact of FMF identified a reliance on cross-sectional data in a majority of studies as a major weakness of previous work (Fiese & Schwartz, 2008). Although the review identifies the studies on the Project-Eat longitudinal data as a notable exception to this trend (see, e.g. Neumark-Sztainer et al., 2008), these studies have been limited in other ways, by inconsistently operationalizing FMF for example (Fiese & Schwartz, 2008) and using only limited controls for potential confounding factors.

This study thus seeks to improve upon and compliment previous work in three ways. First, it utilizes longitudinal data from the Early Childhood Longitudinal Survey – Kindergarten Cohort (ECLS-K), a large panel dataset of American children. Second, the study examines association between the frequency of both family breakfasts and family dinners and a variety of child outcomes, allowing for a more nuanced examination of the importance of FMF than has been explored in previous work. Last, taking advantage of the longitudinal and comprehensive scope of the ECLS-K, the paper provides more robust estimates of the relationship between FMF and child outcomes by controlling for aspects of children, their parents, homes, and schools and by using panel data analysis methods to control for unobserved factors of children that might otherwise bias results.

Data

We utilize data from the spring of kindergarten, spring of 1st grade, and 3rd, 5th, and 8th grade waves of data collection from the ECLS-K. In the analyses, we examine the impact of FMF on 5 outcomes: child test scores in reading, math, and science, and internalizing and externalizing behaviors. Reading and math scores and information on internalizing behaviors were available at each time point, but data on science scores were collected beginning in the 3rd grade, and no data on externalizing behaviors was collected in the 8th grade.

At each survey point, parents reported on the number of days (0-7) in a typical week that children ate breakfast and ate dinner with most of the family. Lacking consistent direction from previous research about operationalization of FMF or a consensus about appropriate critical cut points for meal frequency, we created indicator variables to represent each response for the typical frequency of family meals and family breakfasts. Rather than creating a summary measure as in Gable et al. (2007), we elected to maintain separate measures to investigate the possible independent impacts of breakfast and dinner frequency, and because the correlation between the two measures was sufficiently low (r = .177, p<.001).For each set of dummy variables, we omitted "7" as the comparison group as this was the most common response for both dinners and breakfasts and represents a normative response.

In our analyses we first pooled all available data waves and examined the joint impact of family breakfast and family dinner frequency on each outcome, controlling for a wide variety of potentially confounding influences, including sociodemographic factors, school and teacher characteristics, and a variety of other family and child controls. Second, we specified separate models by grade to investigate whether the effect of family meal frequency differed according a child's grade in school. Last, making use of the longitudinal data in the ECLS-K, we ran child fixed effects in an attempt to control for the unobserved and static characteristics of children and their families that might otherwise bias the results from the pooled models.

Results

Results from the pooled models indicated that there were numerous significant relationships between family breakfast and dinner frequency and child outcomes. In these models (which included the various controls discussed above as well as a control for a child's grade in school), children who ate 5 or fewer breakfasts had significantly lower math, reading and science scores when compared to children eating 7 breakfasts with their families in a typical week, and children eating 2 or zero breakfasts typically had higher average internalizing and externalizing behaviors. For example, children who typically ate breakfast with their families 7 days a week were predicted to have reading scores .10 standard deviations higher than children eating only 2 breakfasts typically ($p<.001$). Interestingly, children who ate fewer than 7 dinners tended to fare better across almost all measures. Children eating 2 to 6 dinners with their families in a typical week had significantly higher math and reading scores, and children eating 5 or 6 dinners had higher science scores. Four to 6 dinners was associated with lower levels of internalizing behaviors, and children eating 0, 5, or 6 dinners together with their families in a typical week had significantly lower externalizing behaviors.

The results from the grade-specific models provided some evidence that the impact of FMF might vary by a child's age. For instance, eating fewer than 7 breakfasts together was most consistently associated with lower math, reading, and science scores in later (5^{th} and 8^{th}) grades. Dinner frequency, however, was more consistently associated with math and reading scores at every grade, with 4 to 6 dinners typically associated with higher scores than for children eating dinner together with their families every night; there were few grade-specific significant associations between dinner frequency and science scores. In addition, there were almost no significant associations between breakfast or dinner frequency and behavior problems at any time point.

Results from fixed effects models portrayed an entirely different set of results, however. With only a couple exceptions, the indicator variables for breakfast and dinner frequency had no significant effects on the outcome variables, and in most cases the magnitude of the coefficients was much reduced over the pooled results. The few significant coefficients had no discernible pattern: children eating 5 breakfasts with their families in a typical week had significantly higher (.028 SD) reading scores ($p<.05$) than those eating 7 breakfasts, children who ate 6 dinners together with their families had significantly higher (.024 SD) math scores than those eating 7 dinners ($p<.05$) and children eating 5 breakfasts with their families had slightly higher levels of externalizing behaviors ($p<.01$) than those eating 7 breakfasts together in a typical week.

Conclusion

Results from the fixed effects models, which provide the strictest test of a causal relationship, suggest that there is little or no average effect of FMF on child cognitive and behavioral outcomes during the period from kindergarten to 8^{th} grade. Findings suggest that the results of previous studies

examining the impact of FMF should be interpreted with a degree of caution as even with the inclusion of an extensive number of controls, the results from cross-sectional analyses or basic longitudinal models may not sufficiently account for unobserved factors that can bias results. Future research with available datasets might attempt to replicate previous results using additional analytic techniques. In addition, future studies should continue to explore whether the importance of eating together varies by a child's age or by other child and family characteristics.

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