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Original Research Article

Parental actions that correlate with preschoolers requesting larger portions of food when away from home

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ABSTRACT

Background: How does a parent's action at home sabotage the way their child eats when they are not at home? This two-part study explored which parental behaviors at home were most correlated with 75 preschooler's requests for larger servings of snacks when away from home and away from parental scrutiny.
Methods: Primary meal providers of three- to five-year old children completed surveys describing how they served food and snacks at home (such as whether they were always available in any amount a child wanted) and a wide range of questions about snacking habits of their children. Two weeks later, their children were met (without their parents present) and asked to indicate how much Froot Loops (a popular pre-sweetened cereal) they wanted for their morning snack. Correlations between how much they served and household snacking behaviors were then explored.
Results: Boys who were often required to clean their plates at home requested more cereal during snack time when away from home ($p<0.05$), and daughters who were able to snack at home whenever at home whether they wanted also requested more ($p<0.05$). Girls who were frequently given fruit as a snack at home requested less presweetened cereal when away from home ($p<0.01$).
Conclusions: Parent actions in the home might have an unexpected impact on how much of less healthy foods children request when they away from such parental oversight. Care must be taken so a parent does not win a food battle at home just to lose any away-from-home food war.

Keywords: Physical food environment, Home food environment, Away-from-home food, Childhood obesity, Preschool children, Clean plate club

INTRODUCTION

As children's age increases, so too does their away-from-home food consumption. Preschoolers, primary school children and adolescents obtain 18%, 26% and 30% respectively of their meals away-from-home.[1] This increase is alarming for two reasons. First, food consumed away from home tends to contain lower fiber, iron and calcium density and higher cholesterol, fat, sodium, saturated fat and caloric density.[2] Second, when children are left to make decisions about away-from-home food, physical and home food environments may lead them to request more. Considering the rise of obesity in the United States can be attributed to only 15 additional calories a day, requests for more of an away-from-home food may be a crucial contributor to childhood overweight.[3-6] This research examined the unique contribution of physical and home eating environments on children's requests for more away-from-home food.

Two key areas of research hold promise in helping mitigate children's requests for more away-from-home food. The first includes the impact of the physical environment, such as bowl size, on serving and eating

behavior.[7] The second includes the impact of home environments, such as when, how much and what to eat, on serving and eating behavior.[8] The explicit connection, however, between these environments and young children's requests for more away-from-food has yet to be examined.[7,9,10] Also, it is not clear if these connections would hold once accounting for what many suggest to be a crucial contributor to children's eating behaviors, namely the body mass of the primary meal provider and their child.[11,12] That is, greater body mass has been suggested to be responsible for both responsiveness to aspects of physical food environments and parental behaviors in home environments that are thought to be responsible for greater consumption.[13-17]

The objective of this study was to explore how a child's snacking behavior and eating routines at home influenced their snacking behavior when they were away from home and away from the influence of their parents. This research made two contributions. First, the explicit link between two environments, physical, and home and young children's requests for more away-from-home food was explored for the first time. Second, the relationship between these environments and requests for more away-from-home food was examined independent from the potential influence of BMI.

Household eating environments

Household eating environments, such as allowing children to eat meals whenever they wish or encourage children to clean their plate, may both be associated with requests for more away-from-home food, but for different reasons. Allowing children to eat meals whenever they wish may be indicative of permissive parenting styles that are characterized by their child allowing to make their own decisions with minimal consequences for wrong behavior.[27-29] This type of parenting style has been associated with deficits in children's ability to self-regulate themselves because they do not learn proper boundaries for consumption.[30,31] It is expected that when faced with the possibility of having a highly palatable away-from-home food, children coming from home environments that allow them to eat meals whenever they want will request more of it.

While permissive home environments may have parents who are too responsive to their children, controlling home environments may have parents who are not responsive enough. One indication of this type of environment is one in which parents have their children clean their plate.[32-34] Controlling home environments without appropriate responsiveness to children can backfire.[35-37] Children, for example, who come from home environments where parents pressure them to eat certain types and amounts of food are more likely to increase fat intake and have larger BMIs.[38] This is because excessive parental control may actually inhibit the development of their child's self-control.[39] Thus, it is expected that when faced with the possibility of having a highly palatable away-from-home food, children coming from home environments that are encouraged to clean their plate will request more of it.

In contrast to home environments that promote children's requests for more away-from-home food, some home environments may mitigate these requests. Foods children prefer and perceive to be appropriate to eat may be determined by both on the frequency parents eat and serve a particular food.[40-42] At young ages, children may not completely understand what exactly healthy or unhealthy means, but they do know what foods they have consumed or to which they have been exposed. The mix of foods to which children have been exposed are usually skewed in a particular health dimension. Parents for example, who frequently give fruits and vegetables to their children may also be more likely to avoid serving foods that are less healthy. As a consequence, children prefer foods to which they consume and have been exposed to frequently.[43] Thus, when faced with the possibility of having a highly palatable away-from-home food, children coming from home environments that expose them to fruits and vegetables may request less of it.

Obscuring the relationship between home environments and children's requests for away-from-home food is the potential influence of a primary meal giver's and their child's BMI.[10] Parents, for example, who have weight problems and/or perceive their children to have weight problems are more controlling of and less responsive to their children's food behavior.[8] As a result, children who come from this type of home environment, may have more problems with self-control leading them to request and eat more of a highly palatable away-from-home food. This is an important contribution to understanding the influence of adiposity status of parent and child on food behavior.

METHODS

This IRB-approved study (Cornell University) involved three and four-year old preschool children (59% female; age=4.3±0.91) and their primary meal providers at three preschools in Ithaca, New York in 2006. These preschools agreed to let us send questionnaires and consent forms to their mothers and to then conduct food behavior-based studies with the children whose mothers provided consent. 75 children's were involved in this study. The analyses used to analyze the data involved correlations, regression and ANOVAs.

Phase I: parental survey

To understand if children would request more away-from-home food as a function of home environments four target (when, how much and what to eat) and nine profile questions were asked, some of which were adapted from the child feeding questionnaire. To assess when, mothers were asked if they allowed their children to eat meals whenever they wanted. To assess how much, mothers

were asked if they told their children to clean their plate. When asking mothers about what children ate, two questions were asked. Mothers were asked how many days they gave fruit as a snack to their child and the extent to which they agreed or disagreed that when their child was presented with vegetables, they usually ate them (an example of some of these questions can be shown in Table 1). Last, mothers were asked to report their height and weight so to compute their BMI.

Additional questions were asked that profiled parental and child behaviors that were likely to co-occur with target questions. These questions were asked to better help profile home environments that suggested when, how much and what to eat. For example, to better assess what other home environments were likely to co-occur with "*I allow my child to eat meals whenever they want"*, three additional questions were asked. First, mothers were asked the extent to which they agreed or disagreed that they were responsive to their child. This question was asked because of research that suggested that permissive parenting, characterized by excessive responsiveness may lead to impulsive behaviors related to food.[30,31] Additional questions such as mother's frequency of eating while the TV was on and allowing their child to get snacks whenever they wanted were asked to assess home environments that were excessively permissive in the eating behavior modeled by parents and the eating behavior allowed of their children.[12]

Table 1: Questionnaire instrument.

Questionnaires	Related profile item #	Response scale
Target items		
My children have the option of eating meals whenever they want[a]	1,2,3	(1=disagree; 9=agree)
I tell my child to clean their plate[a]	1,4,5,6	(1=seldom; 9=frequently)
How many days do you give fruit as a snack to your child	7,8,9	(0=zero days a week; 7=everyday)
Profile items		
I am responsive to my child	1,2	(1=disagree; 9=agree)
How many days a week do you eat with the TV on?	1	(0=zero days a week; 7=everyday)
Can your kids get snacks by themselves whenever they want?	1	(1=no; 2=yes)
Do you give your kids seconds when they ask for them?	2	(1=seldom; 9=frequently)
Does your child eat between meals?	2	(1=seldom; 9=frequently)
I tell my child what to eat[a]	2	(1=disagree; 9=agree)
Do you eat your 5 fruits or vegetables a day?	3	(1=seldom; 9=frequently)
How many days do you serve salad as part of a meal	3	(0=zero days a week; 7=everyday)
Do you have foods in the house that children are not allowed to eat at any time?[a]	3	(1=yes; 2=no)

[a]These items modified from child feeding questionnaire.

To assess what other home environments were likely to co-occur with *"I tell my child to clean their plate"*, three additional questions were asked. Mothers were asked how frequently they gave their child seconds when they asked for them and how frequently their child ate between meals. Last, mothers were asked the extent to which they agreed that they told their child what to eat. All of these questions relate to home environments which without appropriate responsiveness to children can lead to inhibition of self control.[32-38]

To assess what home environments were likely to co-occur with "*I give fruit as a snack to my child"*, three additional questions were asked. Mothers were asked how frequently they ate their 5 fruits and vegetables a day and if they frequently served salad as part of a meal. Last, mothers were also asked if they had food in the home that their child was not allowed to eat. All of these questions relate to home environments that include the frequency parents eat and serve particular foods.[40-45]

Phase 2: Serving an out-of-home snack

Approximately two weeks after mothers completed the questionnaire, each child was met at their respective daycare center and told that they would be asked questions about food. Using the alphabetized preschool roster, children's height and weight were first measured to be able to compute their age and sex specific body mass index. Next, a cereal pouring activity was conducted where each child was given a large 16-ounce bowl and asked to indicate how much cereal they would like to have for a hypothetical morning snack. A large bowl was used in this study to allow for maximum potential variability in requests. Because mothers in a pre-study claimed to generally pour the cereal and milk for their child's breakfast, children were served how much they said they wanted instead of risking accidental pours and spills. To be as precise as possible, a scoop was used to pour a small amount of cereal (3-4 grams) into their bowl at which point the child was either asked *"Is that enough or do you want more?"* or they were asked "*Do*

you want more or is that enough?" Both versions of this statement were again rotated each time the child was questioned. If children indicated that they wanted more, a researcher would add another 3-4 grams to the bowl and again asked if that was enough or if they wanted more. This procedure would continue as long as children indicated that they wanted more. If children indicated that they had been given enough, their bowl was removed and its weight was recorded.

Approval for the study was conditional on the children not consuming the cereal. Instead of being given the cereal, children were allowed to select a small toy. After selecting their toy, they returned to their play area. None of the children responded as being disappointed in not being able to eat the cereal, but were happy to have received a toy.

RESULTS

Boys and girls requested equal amounts of Froot Loops than girls (35.6±18.2 g versus 36.9±32.7 g, p=0.85). Because interest was in the unique contribution of home food environments on children's desired servings of food, each analysis controls for mother and child BMI. When mothers allowed their child to eat at home had an effect independent of their and their child's BMI on how much Froot Loops their child requested away-from-home. Mothers, for example, who allowed their children to eat meals whenever they wanted also had children who requested more Froot Loops ($ß_{daughter}$=0.24, p<0.10), but this effect was stronger for daughters ($ß_{daughter}$=0.44, p<0.05) (Table 2). Also, mothers who allowed their children to eat meals whenever they wanted independent of their or their child's BMI more strongly agreed that they were more responsive to their child (partial r (50)=0.31, p<0.05), more frequently ate with the TV on (partial r (44)=0.31, p<0.05) and had children who were allowed to get snacks by themselves whenever they wanted (partial r (50)=0.33, p<0.05).

How much food mothers told their children to eat at home had an effect independent of their and their child's BMI on how much Froot Loops their child requested away-from-home. Mothers, for example, who more strongly agreed that they told their child to clean their plate had children who requested greater amounts of Froot Loops ($ß_{all}$=0.26, p<0.10), but this effect was stronger for sons ($ß_{sons}$=0.43, p<0.05). Also, mothers who more strongly agreed that they tell their child to clean their plate independent of their or their child's BMI did not agree that they were more responsive to their child (partial r (51)=0.09, p=ns), less frequently gave their child seconds when they asked for them (partial r (50)=-0.31, p<0.05), less frequently had children eat between meals (partial r (51)=-0.39, p<0.01) and more strongly agreed that they tell their child what to eat (partial r (51)=0.36, p<0.01).

Table 2: Household eating environments that correlate with requests for more away from home food.

Questionnaire target items	Boys (n=31)	Girls (n=44)	All (n=75)
My children have the option of eating meals whenever they want	0.07	0.44**	0.24*
I tell my child to clean their plate	0.43**	0.21	0.26*
I frequently give fruit as a snack to my child	0.13	-0.50***	-0.29**

Note: all coefficients are standardized betas controlling for mother and child BMI; p<0.10; **p≤0.05; ***p<0.01.

What mothers gave their child to eat at home had an effect independent of their and their child's BMI on how much Froot Loops their child requested away-from-home.

Mothers, for example, who frequently served fruit to their children as a snack also had children who requested less Froot Loops ($ß_{all}$=-0.29, p<0.05), but this effect was largely driven by daughters ($ß_{girls}$=-0.50, p<0.01) (Table 2). Also, mothers giving fruit to their child as a snack independent of their or their child's BMI more frequently ate 5 fruits or vegetables a day (partial r (52)=0.35, p<0.01), served salad as part of a meal (partial r (53)=0.39, p<0.01) and were less likely to have foods in the home that their children were not allowed to eat (partial r (53)=0.24, p=0.07).

DISCUSSION

These results suggested specific home environments independent of mother and child BMI were related to requests for more of an away-from-home food. While the effect was qualified by the sex of the child, the pattern remains cleared allowing children to eat meals whenever they wanted may be an indication of too much responsiveness in the home regarding food.

Mothers who allowed their children to eat meals whenever they wanted were also likely to agree that they were more responsive to their child, ate while watching TV and allowed their child to get snacks whenever they wanted. These environments had been suggested to lead to deficits in children's self-regulation possibly indicated by requests for more of a palatable away-from-home-food.

While permissive home food environments characterized by allowing children to eat whenever they wanted may have parents who were too responsive to their children, controlling home environments may have parents who were not responsive enough. Mothers who told their child to clean their plate was not associated with them agreeing that they were responsive to their child. These mothers also less frequently gave their child seconds when they asked for them, less frequently had children eat between meals and more strongly agreed that they told their child

what to eat. Previous research had suggested that home environments such as these results in inhibition of self-control possibly indicated by requests for more of a palatable away-from-home-food as found in this research.[35-37] In contrast to home environments that promoted children's requests for more away-from-home food, home environments that promoted fruit and vegetable consumption may actually mitigate these requests. Mothers who gave fruit as a snack to their child also more frequently ate their 5 fruits and vegetables a day, frequently served salad as part of a meal and less likely to have food in the home that their child was not allowed to eat.

The relationship, however, between mothers giving fruit to their daughters and requesting less of a palatable away from home food was stronger than the same relationship for sons. While this type of result was been reported elsewhere, it remained curiously independent of mother and child's BMI, which had been thought to be somewhat responsible for this differential effect.[38,39] It may be that young girls identified with their mothers more than little boys when it came to what to eat.

Limitations

Because the focus of this research was the unique influence of food environments on requests for more away-from-home food independent of BMI, associations between these environments and BMI were not explicitly tested. A curious result, however, was found. Mothers who allowed their children to serve themselves during dinner in contrast to being served also had children who had larger BMIs (ß=0.32, $p<0.05$). Once taking mother BMI into account, this significant result disappears (ß=0.14, $p=0.26$). This emphasized the need for future studies, when attempting to test the effect of household eating environments on BMI of young children, to account for maternal BMI. Spurious correlations can occur between consumption norm variables and children's BMI simply because obese mothers may employ feeding behaviors that contributed to obesity and have children who were predisposed to obesity. Last, overt hunger was not assessed in this research prior to cereal pouring tasks. While it was possible that children's hunger could have influenced the results of this research, we believed that it would have been minimal. This was because all children participated in the research immediately after arriving at school. This meant that the children either ate breakfast just prior to arriving or were given breakfast at the school before they participated. Assuming, then, that hunger was normally distributed between children, the direction and strength of the results would not differ substantially.

CONCLUSION

This research examines two food environments, physical and home, in which improvements can be made. These improvements may be relatively less coercive, quicker and less expensive than waiting for governmental or policy change. Physical environments can be structured in away-from-home contexts such as school cafeterias that can lead to decreases in consumption by simply decreasing the size of eating utensils. Home environments can be changed so that parents provide adequate responsiveness to their child's food wishes without giving them carte blanch decision ability that could harm their food-decisions away-from-home. Parents, furthermore, may be able to non-coercively promote healthier food choices away-from-home by frequently exposing children to fruits and vegetables in the home. If a child's home food environment is littered with fruits and vegetables children need not be overly controlled in what they eat. Focusing on eating environments is not new. What is new is the connection between them and requests for more away-from-home food independent of BMI. While requests for more of an away-from-home food is not the same as children consuming it, recent evidence suggests that at these ages, food requested may be food eaten. Because permission to conduct the research was conditional on children not eating the food, we did not assess actual consumption. Further research should attempt to assess if palatable food requested is indeed palatable food consumed in naturalistic settings away-from-home.

Recommendations

This research attempted to use a realistic scenario of young children requesting foods away-from-home. By using a preschool setting instead of a laboratory and a familiar palatable food it was believed that children would respond to this naturalistic environment in a way that would provide generalizability to away-from-home eating. Because children spend increasingly greater amounts of time away-from-home and in school, we believe this to be the case. Considering away-from-home food consumption was a crucial contributor to overweight.

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