

Advertising Influences on Young Children's Food Choices and Parental Influence

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Objective To evaluate whether advertising for food influences choices made by children, the strength of these influences, and whether they might be easily undone by parental influences.

Study design Children between 3 and 8 years of age ($n = 75$) were randomized to watch a series of programs with embedded commercials. Some children watched a commercial for a relatively healthy food item, the other children watched a commercial for a less healthy item, both from the same fast-food company. Children were also randomized either to receive parental encouragement to choose the healthy item or to choose whichever item they preferred.

Results Results indicated that children were more likely to choose the advertised item, despite parental input. Parental input only slightly moderated this influence.

Conclusion Although advertising impact on children's food choices is moderate in size, it appears resilient to parental efforts to intervene. Food advertisements directed at children may have a small but meaningful effect on their healthy food choices. (*J Pediatr* 2012;160:452-5).

The issue of direct advertising of food items to children has been one of considerable concern and controversy. This is particularly the case when a high number of these advertisements are for unhealthy food selections, and media consumption is considered one risk factor for childhood obesity.¹ Professional organizations such as the American Academy of Pediatrics² and the American Psychological Association³ have expressed considerable concern about the impact of advertising to children on children's healthy food choices.

Much of the attention recently has focused specifically on advertisements of fast food, which is viewed as particularly unhealthy and high in fats, cholesterols, sugars, salt, and calories in general. Children's exposure to fast food advertisements appears to be on the rise despite other positive trends in food advertisements directed at children.⁴ Such exposures appear to be related to increased consumption of advertised products⁵ having deleterious impact on children's healthy eating and weight management. Problems with weight management have been shown to extend not only to health-related problems but also psychopathology.⁶

However, researchers have noted that the effects of media on children can be quite complex.⁷ For instance, one might reasonably hypothesize that studies correlating food advertisement viewing with eating choices or obesity might reflect an underlying passive lifestyle, rather than a causal link of the two. Experimental studies do show that exposure to food advertisements influence food taste preferences⁸ and these effects can be promoted by pairings with iconic characters or toys.⁹ However, it might reasonably be argued that the influences of media advertisements might be easily offset by active parenting encouraging children toward healthy choices.

In this study, we examined both advertising and parenting influences. This allows us to test the hypothesis that advertisement influences can be easily offset by parental involvement.

Methods

Study participants consisted of 75 children recruited from the general community in a small city in south Texas. Children ranged from 3 to 8 years of age, with a mean age of 5.6 years ($SD = 1.78$); 54.7% of the sample were boys ($n = 41$), and most participants were of Hispanic decent (94.7%, $n = 71$), with two Asian-American participants and two participants whose parents did not report their ethnicity. This ethnic composition is reflective of the local city, approximately 95% of which is of Mexican-American decent. Most of the children's parents were married (62.7%), with 14.7% being separated/divorced and 21.3% never having been married (one parent did not report marital status). Parents in attendance were mostly mothers (81.7%), had a mean of 2.65 children in their families ($SD = 1.57$), and had a median family income in the range of \$30 000 to 40 000. Families were recruited via the snowball sampling approach,¹⁰ by which university students recruit their families, neighbors, etc. Although non-random, snowball samples tend to provide reasonably representative samples that reduce sampling self-selection problems.

BMI Body mass index

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Each parent was given a brief demographic form, which included the child's height and weight, television viewing habits, frequency of fast food eating, and the child's primary attraction to fast food, whether the food itself, toy products, or playgrounds provided.

Children were randomly assigned to watch one of two commercials, both promoting McDonald's food products, both 1-minute long. These commercials were embedded in cartoon programs, as described below. Approximately half the children were exposed to a commercial featuring a relatively healthy food item (Apple Dippers), whereas the other half were exposed to a food item that was comparatively less healthy (French fries). These two food items were chosen because they are relatively similar in function (ie, side item), but differ in relative healthiness.

Just as their children were randomized to watch one of two possible cartoons, parents were randomly assigned a brief script to repeat once their children were asked to make a food coupon selection. Half the parents were assigned a script in which they advised the children to select the healthier food choice. The other half of parents were given a script in which they advised the child to choose the selection they most wanted.

The dependent measure of this study was the child's selection of food coupons. Each child was allowed to select one of two food coupons, either for Apple Dippers or French fries. Similarly sized color photographs of each food item were presented to the child, and the child could pick one of the two.

During the research session, parents filled out the demographic form as they accompanied their children in watching a short film, consisting of two cartoons (Tom and Jerry) with 3 commercials between the two cartoons. The three commercials were for Lego, for the randomized McDonald food item aforementioned, and a trailer for an upcoming *Cars 2* movie. This arrangement of one commercial embedded between two others, between cartoons was designed to reflect the nature of commercial exposure in real life and also to reduce demand characteristics.

After the film, a research assistant approached the children and their parents with the pictures of the two food items (Apple Dippers and French fries) and asked each child to select a coupon for one item they could theoretically get at McDonald's (all parents were informed in advance that children would be compensated with a food coupon). The parents were allowed to repeat the script phrase (either encouraging selection of the Apple Dippers specifically or whichever item the child most wanted, depending on randomization), but otherwise not allowed to influence the child's choice. Once children made their selection, they were given their coupon, thanked for their participation, and released.

The procedures aforementioned were designed to allow parents an experimentally controlled opportunity to exert influence that may undo the potential influence of exposure to commercials. All procedures were designed to adhere to federal standards for research with human participants and passed local institutional review board approval.

Results

All children in our sample, as reported by parents, visited a fast food restaurant at least once a month (33.3% once per month, 46.7% once per week, 20% more than once per week). Children's primary motives for attending fast food restaurants varied considerably, although only 32% were attracted primarily by the food, with the greatest percentage (36%) attracted by playground facilities, and 25.3% attracted by toys packaged with food items. A small number of parents (6.7%) did not report on the primary appeal of fast food restaurants.

There were no children in this sample who watched zero hours of daily television, with television viewing averaging 3.28 hours per day (SD = 2.21).

Height and weight data were provided by parents of 46 children (the remainder chose not to report this information or did not know it offhand). This is a small correlational sample with limited power. Such small samples are at very high risk for missed findings because of type II error. To avoid this possibility, these results are interpreted with effect sizes rather than statistical significance.¹¹ We used a threshold of $r = 0.2$ as a guideline for "practical significance." Correlation co-efficients less than this value are highly unreliable and prone to type I error.¹²

Body mass index (BMI) was calculated. BMI was not found to be correlated with television exposure in hours per day ($r = 0.00$). Because our measure of fast food consumption was ordinal rather than interval/ratio, the Spearman rho was used for this correlation. Children's BMI was found to be correlated with fast food consumption ($\rho = 0.32$) at a level higher than our threshold for practical significance.

The ratio of children's choices of Apple Dippers and French fries for the 4 groups are presented in the [Table](#). Condition groups varied somewhat in number of participants because of the randomization process, but did not differ significantly on demographic variables (ie, age, sex). Results were analyzed by using the generalized linear modeling approach for binary logistic outcomes (ie, coupon selection). The Pearson χ^2 method of estimation was used. Child age and sex were considered as possible co-variates, but were not found to be significant co-variates and were eliminated from the final model. Results for the omnibus test for the model were significant ($\chi^2 [2, n = 75] = 13.76, P \leq .001$) and provided a good fit to the data. Results for the parameter estimates revealed that the effects for the

Table. Distribution of children's coupon choices across study conditions

Commercial viewed	Parental influence	Selected Apple Dippers	Selected French fries
Apple Dippers	Healthy	10	5
Apple Dippers	Neutral	14	12
French fries	Healthy	9	11
French fries	Neutral	4	10

commercial (χ^2 [1, $n = 75$] = 12.84, $P \leq .001$) were significant, but results for parental influences (χ^2 [1, $n = 75$] = 2.64, $P \geq .05$) were not. The effect size for the commercial effect was equivalent to $r = 0.41$, higher than the threshold for practical significance, whereas for parental effects, the effect size was equivalent to $r = 0.20$, just at our threshold for practical significance. An alternate model with an interaction term for parental x advertising influences was a poor fit to the data, confirming the two main effects model described as the best fit to the data.

Discussion

These results suggest that advertising influences on children's healthy food choices can be considerable and extend this research by finding that parental influence has only small moderating influence on advertisements. Because television viewing in our sample was relatively frequent (at least 3 hours a day on average) as was fast food consumption, the potential impact on children's healthy eating and potential for obesity probably should not be ignored. Television viewing itself was not predictive of children's BMI, however, suggesting that mere exposure to television may not be sufficient to cause problems with weight gain. This result was based on a very small sample, however, and should be interpreted with caution.

Earlier position statements by professional organizations^{2,3} have taken the tact of "sounding the alarm" on these issues, often using language of "defenseless" children. Although these efforts no doubt reflect very genuine concerns, concerns supported in part by our results, these dramatic efforts do not appear to have had appreciable effects on the frequency of fast food advertisements, children's consumption of television media, or family attendance at fast food restaurants.

We advocate that professional organizations focus on data with the intent of providing this data freely to parents so that parents can make better decisions for their children. Efforts that involve media education for both parents and children, including teaching young children resilience to advertisements, may be helpful. It may also be wise to partner with fast food and media outlets to promote healthy food options and marketing to encourage children to make healthier food choices. The same approaches to advertising that make fast food appealing to children could be successful in promoting healthy food choices.¹³ Huang and Yaroch¹⁴ have advocated efforts to partner with the fast food industry to promote healthy eating. Fast food businesses are unlikely to sacrifice profits,¹⁵ but we remain optimistic that synergy might be reached between media and fast food education for parents and children and efforts by fast food businesses to promote healthy options while maintaining profits.

This study has certain limitations. First, the sample size is relatively small. Second, the sample is largely Hispanic. Although this is positive in extending earlier research to a growing yet underserved minority group, this limits the

generalization of our findings. Lastly, there is the possibility that parental influences in real life are far more numerous and consistent than were present in our laboratory setting. It should not be concluded from our study that advertising influences are impervious to parental moderation, only that on a "one-for-one" level advertising may have stronger short-term impact. It is possible that, even if our use of parental influences had little impact, that "real world" parental influences may have greater impact when parental recommendations are frequently and consistently repeated to children. Caution is required when generalizing short-term laboratory results to the real world. For instance, it may be that the advertisements used here were relatively novel as compared with parental admonitions for watchful eating (to which children may have already become quite accustomed). Our results may reflect relatively short-term changes in accessibility to food-related information rather than longer trends. Our correlational results found that frequency of attending fast food restaurants, an occasion over which parents exercise considerable control, was correlated with BMI, whereas television viewing was not.

We suggest that future research endeavors look toward positive efforts to promote more responsible advertising to children that promotes healthier eating habits. ■

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References

1. Crespo C, Smit E, Troiano R, Bartlett S, Macera C, Andersen R. Television watching, energy intake, and obesity in US children: results from the third National Health and Nutrition Examination Survey, 1988-1994. *Arch Pediatr Adolesc Med* 2001;155:360-5.
2. American Academy of Pediatrics. Children, adolescents, and advertising. *Pediatrics* 2006;118:2563-9.
3. American Psychological Association. Report of the task force on advertising and children. Available at <http://adage.com/images/random/childrenads022404.pdf>. Accessed Apr 10, 2011.
4. Powell L, Szczypka G, Chaloupka F. Trends in exposure to television food advertisements among children and adolescents in the United States. *Arch Pediatr Adolesc Med* 2010;164:794-802.
5. Wiecha J, Peterson K, Ludwig D, Kim J, Sobol A, Gortmaker S. When children eat what they watch: impact of television viewing on dietary intake in youth. *Arch Pediatr Adolesc Med* 2006;160:436-42.
6. Desai R, Manley M, Desai M, Potenza M. Gender differences in the association between body mass index and psychopathology. *CNS Spectrums* 2009;14:372-83.
7. Desai R, Krishnan-Sarin S, Cavallo D, Potenza M. Video-gaming among high school students: health correlates, gender differences, and problematic gaming. *Pediatrics* 2010;126:e1414-24.
8. Robinson T, Borzekowski D, Matheson D, Kraemer H. Effects of fast food branding on young children's taste preferences. *Arch Pediatr Adolesc Med* 2007;161:792-7.
9. Johnson-Askew W, Fisher R, Yaroch A. Decision making in eating behavior: state of the science and recommendations for future research. *Ann Behav Med* 2009;38(Suppl. 1):S88-92.

10. McCrae R, Costa P, Terracciano A, Parker W, Mills C, De Fruyt F, et al. Personality trait development from age 12 to age 18: longitudinal, cross-sectional and cross-cultural analyses. *J Pers Soc Psychol* 2002;83:1456-68.
11. Cohen J. A power primer. *Psychol Bull* 1992;112:155-9.
12. Ferguson C. An effect size primer: a guide for clinicians and researchers. *Professional Psychol Res Pract* 2009;40:532-8.
13. de Droog S, Valkenburg P, Buijzen M. Using brand characters to promote young children's liking of and purchase requests for fruit. *J Health Commun* 2011;16:79-89.
14. Huang TT, Yaroch AL. A public-private partnership model for obesity prevention. *Prev Chronic Dis* 2009;6:A110.
15. Ludwig DS, Nestle M. Can the food industry play a constructive role in the obesity epidemic? *JAMA* 2008;300:1808-11.