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AN ANALYSIS OF EXPOSURE TO NON-NETWORK TELEVISION ADVERTISING

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QUALIFICATIONS

I am a staff Economist with the FTC. I received my Ph.D. in economics from the University of Chicago in June,1978. My dissertation, "The Distribution of Advertising Within An Industry", was written under the supervision of Lester Telser. It examined the determinants of household purchases of advertised brands in four industries. The study required the use of trade sources of advertising data to construct measures of household exposure to advertising. The study used simultaneous equation techniques to separate household demand for and firm supply of advertising messages.

Summary

This study analyzes the patterns of exposure to spot television advertising of children and adults. The study matches data on spot advertising aired over approximately 260 local stations, both independents and network affiliates, with data on the station's audience during the period when the advertisement was broadcast. Using this data, it is possible to construct a measure of exposure to advertising which takes into account both the length of the ad and the number of people who saw it. This measure is gross impressions, or minutes of advertising times the number of people in the audience.

Using the gross impressions measure, the study analyzes the distribution of children's advertising exposure across different product classes. May is analyzed as a typical month, but data for the other months studied (February, July, and November) support the same conclusions. All data are for 1977. The study focuses on advertising to all children 2 to 11, since the data indicate differences in advertising exposure of younger and older children are insignificant.

Most of the advertising seen by children is advertising for a wide variety of products grouped in "other" categories. However, certain individual products clearly stand out in the extent to which their advertising is directed to children.

In particular, advertising for toys and presweetened cereals accounts for 11.2% of children's exposure to advertising in May. Toy advertising predominates; children's exposure to spot toy advertising is roughly twice their exposure to presweetened cereals. The concentration of advertising for these products on child audiences is even more apparent when attention is restricted to times when children constitute a relatively large fraction of the audience. The share of total exposure to advertising accounted for these products rises steadily as the fraction of children in the audience increases, reaching 30.4% when children constitute at least 50% of the viewing audience.

Other highly sugared products also constitute a significant fraction of children's total exposure to advertising --10.3% in May. However, children are significantly exposed to advertising for many of these products only because they are generally heavily advertised products, and not because they are particularly heavily advertised to children. As the percentage of children in the viewing audience increases, the share of total exposure accounted for by other highly sugared products increases only slightly at best, and in several cases, declines.

The study also demonstrates that much of children's exposure to advertising occurs during times when children

constitute a relatively large fraction of the audience. When children are at least 20% of the actual viewing audience (compared with 15.5% of the potential viewing audience in the markets analyzed), they receive 57.8% of their total exposure to advertising; when they are at least 30% of the audience, they receive 47% of their total exposure; and when they are at least half the audience, they receive 23% of their total exposure to advertising. By constrast, the vast majority of adult exposure to advertising occurs during times when children are less than 20% of the audience--86.7% in May. Adult exposure to advertising when children are at least half the audience constitutes only 2.33% of total adult exposure to advertising.

The study also analyzes differences and similarities in the patterns of exposure of children and adults to advertising of different product classes. Apart from the large "other" classes, there are substantial differences. However, most of the differences is due to differences in their exposure to advertising for toys and presweetened cereals. Knowledge of the distribution of advertising exposures of adults is sufficient to explain only 54% of the variation in children's exposure to spot television advertising in the 22 individual product classes considered, but it is sufficient to explain 92% of the variation in the 20 classes other than toys and

presweetened cereals. There is weaker evidence that exposure patterns for candy and cakes, pies and pastries may also differ for children and adults.

Examining differences in advertising exposure of children and adults within a product class leads to the same conclusion. While total exposure of adults is greater than exposure of children in every product class, toys and presweetened cereals direct a distinctly larger fraction (46% and 43%, respectively) of their total advertising impressions to children than do other products. Since children are only 15.5% of the potential viewing audience, the concentration of these products on children is apparent. Bicycles and candy deliver over 30% of their total exposures to children, while sugared gum and cakes, pies, and pastries complete the list of products delivering over 20% of their total impressions to children.

Overall, combining the four months, 15.4% of total spot advertising impressions are impressions to children. Thus, children are not, on the average, more heavily exposed to spot advertising than are adults. However, certain products do direct relatively more of their advertising to children than adults.

I. GENERAL DESCRIPTION 1/

A. The data base.

To analyze non-network advertising seen by children, I obtained 1977 data on advertising aired on different stations and the audience of those stations. Advertising data were obtained from Broadcast Advertiser's Reports, Inc. From this data, estimated expenditures and length of advertisements were calculated for each of approximately 267 television stations located in 75 of the largest U.S. television markets. According to Arbitron Television estimates, there are 159,928,100 persons 2+ in television households in these markets, and 24,798,200 children 2-11. Thus, children are 15.51% of the potential audience in these cities.2/

Advertising data were accumulated separately for each of 17 dayparts (specified periods of time on specified days). For each daypart on each station we, therefore, have estimates of total advertising expenditures, and total minutes of advertising for each of 26 different product classes. Product class definitions were provided by the Federal Trade Commission, Bureau of Consumer Protection. The data include only spot advertising--advertising sold by and aired only on a local station (either a network affiliate or an independent), as distinct fron advertising sold by the network and aired on all stations carrying the network program. Calculations

were made separately for four months--February, May, July, and November. The data are based on monitoring of each station for one week out of the month. All of the tables in this report will, therefore, report the total for one week out of each month, for 1977.

For eleven of the dayparts for each station, advertising data could be matched with data on the average quarter hour audience of the station. It is assumed that the average quarter hour audience actually saw each ad, regardless of when the ad ran within a daypart. On the average, this assumption is of course true, but there may be considerable variation within a daypart. In each of the months, audience estimates were unavailable for some of the dayparts; advertising in these dayparts accounts for approximately 16% of total advertising minutes, and 15% of total advertising expenditures. In omitting these dayparts from the analysis of viewing advertising, we implicitly assume that the distribution of exposure to advertising is the same as in all other dayparts combined.3/

It is important to emhasize the special meaning of a daypart in this study. A daypart is a specified period of time, on a specified day of the week, on a specified station. Thus, in a city in which five stations are monitored from 8:30 a.m. to 1:00 p.m. on Saturday, there would be five

dayparts (one for each station). Dayparts are thus close to a concept of programs, except that a daypart on a station will typically include several different programs (since more than one program may be shown in the specified time period). Appendix A shows the standard time periods which are used by Arbitron; for example, 8:30 a.m. to 1:00 p.m. is the daypart for Saturday morning.

Where we discuss certain audience characteristics-- e.g., an audience composed on 50% or more children--it may be that one station's daypart may qualify, while another station daypart for the same time period may not. Thus, in selecting samples based on audience composition, each station's audience data for each daypart was treated separately.

B. Gross impressions as a measure of exposure to advertising.

To examine children's exposure to advertising, we need a measure which takes into account both the amount of advertising time and the size of the audience at the time the ad was broadcast. One such measure is gross impressions, defined as minutes of advertising times the number of people in the audience. Thus, two thirty seconds ads seen by 1,000 children produce 1,000 gross impressions of children. Note that gross impressions take no account of the difference between reach (the number of people who see an ad at least once) and frequency (the number of times an ad is seen by the average person). Thus, one thousand gross impressions could be one

minute of advertising seen by one thousand people, or it could be 500 minutes of advertising seen only by two people. However, the question of reach and frequency is not central to our present concerns. Gross impressions do allow comparison across product classes of the relative emphasis on different population groups and on the intensity of advertising campaigns. This is the manner in which gross impressions will be used throughout this analysis. Gross impressions were computed separately for persons aged twelve and older, children 2 to 11, children 2 to 5, and children 6 to 11.

II. THE DISTRIBUTION OF ADVERTISING SEEN BY CHILDREN ACROSS PRODUCT CLASSES.

A. Children's exposure to advertising in all dayparts

Every advertisement will produce at least some gross impressions to children, because nearly any audience includes at least a few children. In order to determine what product advertising is disproportionately directed to children, it is necessary to consider the distribution of gross impressions to children across product classes. Estimates of this distribution for children 2 to 11 during May, 1977 are presented in Table 1. Table entries give the gross impressions to children for each product class as a percentage of all gross impressions of children. The data for May are fairly typical of the data for other months. I shall discuss only May in detail, noting how the other months differ where it is

Table 1

Percent Distribution of Gross Impressions of Children 2-11: May, 1977

PRODUCT CLASS	ALL DAYPARTS	DAYPARTS WITH CHILD (2-11) AUDIENCE EQUAL TO OR MORE THAN		
		20%	30%	50%
Regular and Casual Footwear	.32%	.41%	.46%	.53%
Desserts and Dessert Ingredients	.12	.06	.04	.02
Ice Cream and Sherberts	.27	.18	.14	.09
Cakes, Pies and Pastries	2.03	2.86	3.10	3.78
Fruit Juices	.14	.04	.03	.02
Appetizers, Snacks and Nuts	.29	.22	.19	.14
Highly Sugared Cereals	3.74	6.28	7.29	10.25
Other Cereals	1.06	1.34	1.51	2.22
Fresh Fruits	.26	.25	.28	.24
Raisins	--	--	--	--
Canned Fruits	.01	.00	.00	--
Cookies	.04	.02	.01	.01
Crackers	.08	.03	.00	.00
Candy	2.23	3.33	3.55	3.92
Regular Gum	1.66	2.09	2.03	1.59
Sugarless Gum	.72	.94	.94	.38
Regular Carbonated Soft Drinks	2.51	2.24	1.96	.92
Diet Carbonated Soft Drinks	.07	.06	.04	.01
Non-Carbonated Soft Drinks	1.46	1.56	1.62	1.91
Other Food and Beverages	8.05	4.77	4.10	2.96
Toothpaste and Toothbrushes	.58	.57	.47	.23
Games, Toys and Hobbycrafts	7.42	12.50	14.73	20.14
Bicycles	.84	1.38	1.57	1.60
Restaurants and Drive-Ins	6.48	6.62	6.73	7.70
Other "Local" Advertising	26.31	22.64	21.22	18.32
All Other Non-Food Advertising	33.33	29.60	27.99	23.00
TOTAL	100.00% *(2,167,980)	100.00% *(1,253,945)	100.00% *(1,026,317)	100.00% *(504,372)

Note: Gross impressions are defined as the number of minutes of advertising times the number of children of the indicated age in the audience, measured in thousand. Table entries give the percentage of gross impressions of children of the indicated age produced by each product class. Columns may not add to 100% due to rounding errors.

*Total Gross Impressions in thousands

relevant. Similar tables for February, July, and November are presented in Appendix B.

The first column of the table presents the results of the analysis when all stations and all dayparts (for which audience data is available) are included in the sample. It is immediately apparent that no one or two products dominate spot advertising. The 23 specific product classes listed in table 1 account for only 32% of children's exposure to advertising. Nearly 68% of gross impressions to children are for other foods, other local advertising, and all other products.4/ We do not know the detailed product class distribution of the ads in these broad classes. A brief inspection of Broadcast Advertiser's Reports listing of the brands included in these categories5/ for a few different markets suggests that the products emcompass many of the thousands of brands in hundreds of different product classes which are advertised on television.

B. Exposure when children are a large fraction of the audience.

To focus more clearly on advertising during those periods when children constitute a large fraction of the audience, the analysis was repeated for three different groups of dayparts and stations, defined by the percentage of children in the audience exceeding a specified value. The analysis was repeated for percentages of children in the audience of at

least 20 percent, thirty percent and 50 percent. The results of these separate analyses are reported in the remaining columns of Table 1.

By considering only subsets of the total number of stations and dayparts available, we of course lose some of the the gross impressions to children which are due to their exposure to advertising in the omitted dayparts. However, this reduction is not proportional to the reduction in the size of the sample.

A large fraction of the gross impressions to children are produced during those times when children constiture a sizable percentage of the audience, a fact which is demonstrated in Table 2. 57.8% of gross impressions to children occur during dayparts when children constiture at least 20% of the audience. When children are at least 30% of the audience, 47.3% of total gross impressions to children are produced, and when children are at least half the audience, gross impressions are still 23.3% of total gross impressions to children. By constrast, very few adult gross impressions are produced during these dayparts. When children are at least 20% of the audience, adult gross impressions are only 13.3% of total adult gross impressions in all dayparts, and when children are half the audience or more, adult gross impressions amount to only 2.3% of adult gross impressions

EFFECTS OF RESTRICTING THE SAMPLE

May, 1977

	ALL DAYPARTS *	DAYPARTS WITH CHILD AUDIENCE EQUAL TO OR MORE THAN (2-11)		
		20%	30%	50%
Percent of total Dayparts Total: 2914	100.00%	23.51%	17.78%	10.78%
Percent of Total Advertising Expenditures Total: $66,921,569	100.00	13.12	8.71	3.41
Percent of Total Advertising Minutes Total: 153,000	100.00	21.35	14.79	5.98
Percent of Total Gross Impressions to Children 2-11 Total: 2,167,980,000	100.00	57.84	47.34	23.26
Percent of Total Gross Impressions to Persons 12+ Total: 13,857,807	100.00	13.28	8.24	2.33

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*/ 1215 dayparts have no audience data, and are therefore excluded.

in all dayparts. The percentages for other months are slightly higher than in May, but the pattern is very similar.6_/ Thus, the large majority of adult gross impressions occur during dayparts when children constitute less than 20% of the total viewing audience.

C. Other advertising when the child audience is relatively large.

As we consider dayparts with progressively larger fractions of children in the audience, the fraction of gross impressions to children accounted for by the "other" categories declines, but remains quite large. Even when children are over half the audience, slightly over 44% of total gross impressions are due to these "other" categories.

It is not clear why other advertising should be such a large fraction of the total. Part of the answer may be the use of daypart averages for the audience data. A daypart may span two hours per day for five days, or more. Within a daypart, there may be some shows with large fraction of children in the audience, and others with a small fraction. Those shows with few children may account for most of the "other" advertising, but the use of the daypart average audience attributes the same child audience to all shows, and hence all ads, within the daypart. Given that the fraction of children in the average [illegible]er hour exceeds 50%, however, it is hard to believe that this accounts for all of the difference. Evidently,

a large fraction of the spot advertising in programs with high percentage of children is advertising for a wide variety of products.

D. Trends for individual product classes as the share of children in the audience increases.

Table 1 also reveals the relative amounts of advertising for the individual products listed in the table. Toys are the most heavily advertised single product, followed closely by restaurants and drive ins. However, as the sample is restricted to dayparts with a high percentage of children in the audience, toy gross impressions account for a rapidly increasing fraction of total gross impressions. In contrast, gross impressions for restaurants are a relatively constant fraction of the total. The table thus suggests that toy advertising tends to be concentrated in dayparts with a high fraction of children, while restaurants and drive-in advertising is more uniformly distributed across the day.

The most dramatic increase in the fraction of total gross impressions accounted for by a single product class as the percentage of children in the audience increases is that for sugared cereals. Sugared cereals account for 3.74% of total gross impressions to children, but 10.25% of the total in dayparts where children comprise at least half of the audience. The fracti[illegible]ttributable to other cereals also

increases, suggesting that advertising for both types of cereal is concentrated in dayparts with a relatively large child audience. Sugared cereals ads are more concentrated, since the percentage increase is somewhat larger than for other cereals.

The other products accounting for appreciable fractions of the total gross impressions to children are regular carbonated soft drinks; candy; cakes, pies, and pastries; sugared gum; and noncarbonated soft drinks. Among these products, regular carbonated soft drinks appear to be important only because these products are heavily advertised in general. They are not particularly advertised to children, as indicated by the sharp decline in the fraction of gross impressions attributable to them as the fraction of children in the audience increases. The other products also increase slightly in those dayparts with a large fraction of children in the audience, but to much less significant extent that in the case of toys or presweetened cereals.

E. Toy and Sugared product advertising summarized.

These trends are summarized in Table 3. The fraction of children's exposure to advertising accounted for by highly sugared products 7/ rises consistently and significantly as the percentage of children in the audience increases. The table also reveals that this increase is due primarily to the

TABLE 3

PERCENT OF GROSS IMPRESSIONS OF CHILDREN 2-11 FOR SUGARED PRODUCTS AND TOYS

May, 1977

PRODUCT CLASS	ALL DAYPARTS (3,195,362*)	DAYPARTS WITH CHILD AUDIENCE EQUAL TO OR MORE THAN		
		20% (2,061,421*)	30% (1,633,808*)	50% (888,607*)
Highly Sugared Cereals	3.74%	6.28%	7.29%	10.25%
Other Sugared Products	10.33	12.34	12.45	12.24
Subtotal	14.07	18.62	19.74	22.49
Toys	7.42	12.50	14.73	20.14
of Toys and All Sugared Products	21.49	31.12	34.47	42.63

*Number of Gross Impressions to Children 2-11 in Thousands

the sharp increase in sugared cereal advertising as the fraction of children in the audience rises. There is an upward trend for other highly sugared products, but it is somewhat erratic. When dayparts with at least 30% children are compared with those having at least 50% children, the fraction of gross impressions accounted for by other highly sugared products actually declines slightly. Thus, advertising for highly sugared products taken as a whole is concentrated in those dayparts when children constitute a high fraction of the audience. Much of this concentration is due to the much higher concentration of presweetened cereal advertising in these dayparts.

Toy advertising also increases sharply as the relative size of the child audience increases. Indeed, the percentage increase in the share of gross impressions accounted for by toys is second only to the percentage increase in the share of gross impressions accounted for by presweetened cereals. Taken together, toys and highly sugared products account for 21.49% of all gross impressions of children. When we restrict our attention to dayparts with at least 50% children in the audience, these products account for 42.63% of the gross impressions delivered to children.

F. Comparisons with other months.

May is, in many respects, a fairly typical month. In each of the months studied, the share of gross impressions to

children is largest for toys, restaurants, and presweetened cereals. Toys and presweetened cereals always show sharp increases in the share of gross impressions they account for as the relative size of the child audience increases, while restaurants and drive ins do not. The share of gross impressions accounted for by highly sugared products increases appreciable as the percentage of children in the audience increases; as in May, this trend in the other months is largely due to the increase in presweetened cereal advertising.

However, there are some differences in the other months analyzed. They are summarized in tables 4, 5 and 6. The February (Table 4) and July (Table 5) data confirm the impression in the May data that most of the apparent concentration of highly sugared product ads in dayparts with a high percentage of children is due to the strong concentration of sugared cereal advertising in those dayparts. Indeed, in the July, the percentage of gross impressions accounted for by other sugared products actually declines as the percentage of children in the audience increases. However, in February and July, toys and highly sugared products account for a somewhat smaller fraction of all gross impressions directed to children in any of the samples than was the case in May. The total share of gross impressions attributable to toys plus highly sugared products is also lower in February and July: 15.5% for all stations and all dayparts,

TABLE 4

PERCENT OF GROSS IMPRESSIONS OF CHILDREN 2-11 FOR SUGARED PRODUCTS AND TOYS

February, 1977

PRODUCT CLASS	ALL DAYPARTS (3,195,362*)	DAYPARTS WITH CHILD AUDIENCE EQUAL TO OR MORE THAN		
		20% (2,061,421*)	30% (1,633,808*)	50% (888,607*)
Highly Sugared Cereals	3.35%	5.07%	6.16%	9.00%
Other Sugared Products	8.15	9.72	10.24	10.00
Subtotal	11.50	14.79	16.40	19.00
Toys	4.14	6.21	7.53	11.37
Total of Toys and All Sugared Products	15.64	21.00	23.93	30.37

*Number of Gross Impressions to Children 2-11 in Thousands