

Magazines' Secret Weapon*

**Media Selection On The Basis of Behavior,
As Opposed to Demography!**

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Summary

The most widely used sources for measuring radio and television audiences are Arbitron and Nielsen, respectively. Both these sources report data in total, and with respect to key demographically defined target groups (e.g., women 25-49). Consequently, broadcast (i.e., radio and television) vehicles are almost universally selected in terms of their relative ability to reach a single demographically defined target. In most cases, the target is selected because group members have a higher likelihood of engaging in a specific consumer behavior (e.g., use advertised category and/or brand).

A basic tenet underlying the "traditional" method of media selection is that target audience membership can be used to accurately predict consumer behavior. An analysis of over 1,700 consumer measures taken from MRI's 1998 Doublebase Study clearly shows that this is not the case. Specifically, an analysis of MRI (Mediamark Research Inc.) data showed that, on average, target audience membership "explained" less than 2% of total variance. In addition to not being able to predict consumer behavior, the "traditional" method can be criticized for its reliance on a flawed and biased measure (index) for defining target audiences, and for its failure to take into account the contribution of non-target members. Collectively, the shortcomings of the "traditional" method invite media-inefficiencies.

Despite these shortcomings, and despite the fact that there are multiple sources (e.g., MRI and Simmons) which enable magazines to be selected on the basis of their ability to reach behaviorally defined targets, the "traditional" method is still widely used to select magazines.

There are at least two reasons to account for this state of affairs:

1. Broadcast vehicles generally account for the lion's share of a media schedule. Consequently, the methods used to select television and radio programs are automatically applied to magazines and other print vehicles.
2. Most people are not aware of just how poorly target audience membership predicts consumer behavior, and the cost-inefficiencies that may result when media selection is based on the ability to reach a demographically defined target.

The ability to select media vehicles on the basis of a behavioral target is a decided advantage for magazines. To fully exploit this advantage, however, guidelines and procedures should be developed for defining behavioral targets, and selecting magazines based on these targets.

Traditional Method of Media Selection

In the vast majority of cases, both broadcast and print vehicles are selected on their relative ability to reach a specific demographic target (e.g., men 18-34). Generally, the target used in the selection process "indexes" high with respect to some behaviorally defined measure (e.g., use advertised category and/or brand).

Although the above method is used almost exclusively for media selection, it can be criticized on the following three grounds:

1. Demographic group membership is generally a very poor predictor of consumer behavior
2. Indices are inappropriate statistics to use for defining target audiences
3. The contribution of non-target members is ignored.

Following is a review of each of these criticisms, and a discussion of how behaviorally based media selection models can be used to make magazines a more desirable medium.

Criticism #1 – Demographically Defined Target Audiences

In order to evaluate the degree to which belonging to a specific demographic group predicts consumer behavior, 1,777 behavioral measures were selected from MRI's 1998 Doublebase Study for analysis. To help ensure that these measures were representative of all the consumer measures reported by MRI, the measures were selected from 18 different categories (See Exhibit A).

Exhibit A
Number of Measures By Category

	<u># of Measures</u>	<u>Example of Category Measures</u>
Apparel	88	Bought women's sweater (past 12 months)
Appliances	116	Household has central air conditioning
Automotive	365	Household owns a Chevrolet
Computer/Online	91	Used the Internet at home (past month)
Electronics	81	Household owns large screen TV
Financial	91	Have 401K retirement plan
Home Items	39	HH owns waterbed
Hotels	32	Stayed at Holiday Inn (past 12 months)
Insurance	132	Have dental insurance
Leisure	97	Attended movies in last 6 months
Shopping	92	Ordered items by mail/phone (past 12 months)
Sports	114	Jogged (past 12 months)
Sports Equipment	38	Own treadmill
Stores	136	Shopped Home Depot (past 12 months)
Theme Parks	44	Visited a theme park (past 12 months)
Tools	46	HH owns electric drill
Toys	29	Bought any children's toys (past 12 months)
Travel	146	Any foreign travel (past 3 years)

For each of the 1,777 measures, membership in each of 42 demographic target audiences was used to predict behavior (See Exhibit B). This is tantamount to asking the following question:

"If we know that a person belongs to a specific demographic group, how much better are we able to predict whether he or she engages in the behavior under investigation?"

Exhibit B
Target Audiences Used in Analysis

Men	Women 18-34	HHI=\$75,000+
Women	Women 35+	HHI=\$50,000+
Age 18-34	Women 18-49	Single
Age 35+	Women 25-49	Married
Age 18-49	Women 18-54	HH Size=1-2
Age 25-49	Women 25-54	HH Size=3+
Age 18-54	Parents	Presence of Children
Age 25-54	Head of Household	Own Home
Men 18-34	Professional/Managerial	Home Value=\$100,000+
Men 35+	College Grad or More	White
Men 18-49	Full-Time Employed	Black
Men 25-49	Part-Time Employed	Other Race
Men 18-54	IEI=\$50,000+	Spanish Speaking
Men 25-54	IEI=\$40,000+	Homemaker

For example, if we know that a person is a male, how well does this help us predict whether he owns a Ford? Similarly, how well is Ford ownership predicted on the basis of having a household income in excess of \$50,000 per year? Being between the ages of 25 and 49? Owning a home? Graduating college?

Once the predictive ability of each of 42 demographic target audiences was computed for each of 1,777 measures, two analyses were performed on a measure-by-measure basis:

- In the first analyses, the target audience that best predicted the behavior under investigation was selected
- In the second analyses, the method of selection was based on the target audience that had the highest index with respect to the behavior under investigation.

Technical Note

Before discussing the results of the above two analyses, a few words about how target audience membership is used to predict behavior are in order.

Mathematically, determining the ability of target audience membership to predict behavior boils down to using "0's" and "1's" to code both target audience membership and the behavior under investigation. For example, if the target audience is defined as men 18+ and the behavior under investigation is Ford ownership, then the following four coding sequences are possible:

<u>Sex</u>	<u>Own-Ford</u>	<u>Target Code</u>	<u>Behavior Code</u>
Male	Yes	1	1
Male	No	1	0
Female	Yes	0	1
Female	No	0	0

Once each person is coded, a "phi" correlation coefficient is computed. This coefficient is then squared to determine the amount of variance explained on the basis of group membership. If target audience membership were a "perfect" predictor of the behavior under investigation, the amount of variance explained would be 100%. If target audience membership is not at all related to the behavior under investigation, the amount of variance explained would be 0%.

It is to be noted that "explained variance" can reach a 100% only when the incidence of the behavior under investigation and the size of target audience are identical. For example, if the percentage of people who visited a foreign country in the past three years is 20%, and the percentage of people with a household income in excess of \$75,000 per year is 20%, then it is theoretically possible that the only people who visited a foreign country in the past years had an annual income of \$75,000 or more. If this were the case, membership in this affluent segment would perfectly predict the behavior under investigation.

Criticism #1 – Demographically Defined Target Audiences (Continued)

The results of the first analysis clearly shows that the "traditional" method of media selection does an extremely poor job at predicting behavior, even when the target audience for each measure was selected specifically for this purpose. As can be seen in Exhibit C, the average amount of variance explained across the 1,777 measures is only 1.6%, ranging from a high of 3.7% for the apparel category, to a low of .3% for the theme park category.

On a more positive note, the "best predictor" approach identified targets which, on average, accounted for 61.7% of all adults who engaged in the behavior under investigation.

Exhibit C **Best Predictor Analysis**

	<u>% Engaging In Behavior</u>	<u># of Measures</u>	<u>Variance Explained</u>	<u>Index</u>
Apparel	69.6%	88	3.7%	163
Appliances	65.2%	116	2.3%	131
Automotive	62.9%	365	1.1%	151
Computer/Online	58.7%	91	3.4%	193
Electronics	61.2%	81	2.9%	148
Financial	63.3%	91	1.3%	184
Home Items	59.5%	39	2.3%	137
Hotels	56.4%	32	0.8%	196
Insurance	60.9%	132	1.7%	156
Leisure Activities	61.7%	97	1.5%	156
Shopping	59.6%	92	1.2%	164
Sports	63.0%	114	1.6%	159
Sports Equipment	62.3%	38	2.6%	161
Stores	60.3%	136	0.8%	149
Theme Parks	61.1%	44	0.3%	182
Tools	79.9%	46	1.9%	130
Toys	60.8%	29	1.6%	166
Travel	50.9%	146	1.0%	210
Totals/Averages	61.7%	1,777	1.6%	162

Criticism #1 – Demographically Defined Target Audiences (Continued)

The results of the second analyses show that, when indices are used to select the target, matters go from bad to worse. As can be seen in Exhibit D, the average amount of variance explained across the 1,777 measures is only .9%, ranging from a high of 2.3% for the apparel category, to a low of .2% for the theme park category.

Moreover, the "highest index" approach resulted in the identification of targets which, on average, accounted for only 29.0% of all adults who engaged in the behavior under investigation.

Exhibit D **Index Method of Selection**

	% Engaging In <u>Behavior</u>	# of <u>Measures</u>	Variance <u>Explained</u>	<u>Index</u>
Apparel	37.0%	88	2.3%	184
Appliances	22.9%	116	0.8%	142
Automotive	29.4%	365	0.6%	168
Computer/Online	28.2%	91	1.9%	224
Electronics	22.9%	81	1.4%	164
Financial	27.5%	91	0.7%	221
Home Items	19.8%	39	0.8%	152
Hotels	25.2%	32	0.6%	229
Insurance	27.1%	132	0.5%	173
Leisure Activities	35.3%	97	1.0%	171
Shopping	37.6%	92	0.8%	178
Sports	31.2%	114	0.9%	182
Sports Equipment	27.2%	38	1.5%	191
Stores	24.5%	136	0.5%	165
Theme Parks	26.5%	44	0.2%	205
Tools	29.0%	46	0.6%	150
Toys	46.7%	29	1.4%	173
Travel	28.2%	146	0.7%	234
Totals/Averages	29.0%	1,777	0.9%	181

Criticism #2 - Inappropriateness of Indices

A second criticism of the "traditional" method is that indices are inappropriate statistics to use to select target audiences. There are two reasons which preclude the use of indices for this purpose.

First, as was just discussed, the use of indices can result in the selection of a target that accounts for only a small percentage of all the people who engage in the "target" behavior. When this occurs, media vehicles, in turn, are selected on the basis of their ability to reach a group that accounts for a minority of all users/volume.

Second, an index is a biased measure of segment's propensity to engage in a specific behavior. This is because the maximum index that a segment can obtain is, in part, a function of the segment's size within the population.

For example, it is possible for blacks' to obtain an index of over 800 because they represent only 12% of the U.S. population ($100\%/12\% \times 100=833$). In contrast, the maximum index that white's can achieve is 118 because they represent approximately 85% of the U.S. population ($100\%/85\% \times 100=118$). Thus, if target audiences are selected because they have an index above some specified level (e.g., 120), large demographic segments are at a decided disadvantage and, as a consequence, there is a greater likelihood that the target audience that is selected will account for a relatively small percentage of the total behavioral target.

Criticism #3 -- Ignoring Non-Target Members

As stated previously, the "traditional" method of media selection ignores the user and volume contribution of non-target members, a problem that is exacerbated when the target audience accounts for a minority of the behavioral target.

To illustrate the methodological shortcomings of this approach, consider the following hypothetical example, and several empirical examples which are based on data from the 1998 MRI Doublebase Study.

Hypothetical Example

An investor wants to purchase a restaurant. He has two restaurants in mind - both of which cost one million dollars, and both have the same overhead. In order to decide which restaurant to buy, our investor dons his media hat and decides to count the number of customers in each restaurant on Saturday, the best day in the restaurant business.

Using this procedure, he finds that Restaurant "A" has 500 "Saturday" customers, and Restaurant "B" has 450 "Saturday" customers. Accordingly, our investor decides to purchase Restaurant "A".

At first glance the logic used to select Restaurant "A" appears sound. Further inspection reveals, however, that our investor failed to measure each restaurant's performance during the remaining six days of the week.

By now it should be apparent that the approach used by our investor could have resulted in the less profitable restaurant being purchased. What may not be apparent, however, is that the approach used by our investor is the same approach that is used to select media vehicles.

Let's review the similarity between the two approaches. Our investor counted only "Saturday" customers, and disregarded the contribution of the customers who frequented the two restaurants during the remaining days of the week. Similarly, when vehicles are selected on the basis of the "traditional" media approach, only people within the target segment are counted, and the user and volume contributions of non-target members are ignored.

Actual Example #1

To illustrate how disregarding the contributions of non-target members can lead to substantial media inefficiencies, consider the following example which is based on data from MRI's 1998 Doublebase Study.

Two methods were used to determine the 20 most cost-efficient magazines in terms of reaching Wal-Mart shoppers. In the first method, magazines were ranked based on their cost-efficiency of reaching women 25-49 -- the target segment that has the highest index with respect to "past year Wal-Mart shoppers".

In the second method, magazines were ranked based on their cost-efficiency of reaching these same shoppers, independent of age and sex.

As can be seen in Exhibit E, the first method can result in substantial cost-inefficiencies. This is evidenced by the fact that 9 of the 20 magazines that made the "cut-off" when the criterion was based on the cost-efficiency of reaching a demographically-defined target, did not make the "cut-off" when the criterion was based on the cost-efficiency of reaching a behaviorally-defined target.

Moreover, the "demographic" and "behavioral" cost-efficiency rankings across 189 publications in the 1998 Doublebase Study were only modestly related. Specifically, if the demographic rankings are used to predict behavioral rankings, the amount of explained variance is a modest 33.1% (rank order correlation=.58).

Exhibit E
Cost-Efficiency Ranks Based on
Demographic And Behavioral Targets
(Source=1998 MRI Doublebase Study)

	-----Cost-Efficiency Rank-----	
	Based on Demographic <u>Target</u>	Based on Behavioral <u>Target</u>
<u>Target</u>	W25-49	Wal-Mart
Var.Exp.(Total)	33.1%	33.1%
Correlation Coefficient	.58	.58
Magazine A	1	3
Magazine B	2	5
Magazine C	3	7
Magazine D	4	8
Magazine E	5	6
Magazine F	6	10
Magazine G	7	16
Magazine H	8	12
Magazine I	9	28
Magazine J	10	15
Magazine K	11	58
Magazine L	12	43
Magazine M	13	23
Magazine N	14	37
Magazine O	15	18
Magazine P	16	51
Magazine Q	17	41
Magazine R	18	9
Magazine S	19	31
Magazine T	20	39

Actual Example #2

The prior example is not atypical, and was not "cherry picked" to prove a point. Rather, it was selected because it was representative of what can be expected when one uses a method that doesn't predict behavior and disregards the contribution of non-target members. To further illustrate the point, let's examine the relationship between "demographic" and "behavioral" cost-efficiency rankings of six other measures in the 1998 Doublebase Study.

As can be seen in Exhibit F, the relationships between these two sets of rankings are similar to those seen for Wal-Mart for each of these six measures. For example, out of the 20 most cost-efficient magazines in terms of reaching those with a household income in excess of \$75,000 per year (the demographic target for Honda ownership), 9 (45%) did not make the top 20 list when the criterion for selection was the cost-efficiency of reaching actual Honda owners. In fact, across the eight measures shown in Exhibit F, 46.7% of the magazines that made the "top 20" list when a demographically defined target was used as a criterion for selection did not make list when the criterion for selection was a behavioral defined target. Moreover, as was true in the "Wal-Mart" example, the "demographic" and "behavioral" cost-efficiency rankings across 189 publications in the 1998 Doublebase Study were only modestly related for each of the six measures, with the average explained variance being 46.0%.

Exhibit F
Additional Cost-Efficiency Ranks Based on
Demographic And Behavioral Targets
(Source=1998 MRI Doublebase Study)

Behavioral Target	Honda	Mercedes	Imported	Lexus	K-Mart	J.C.
Demo Target	HHI=75+	HHI=75+	HHI=75+	HHI=75+	W25-49	Penney
Var.Exp.(Total)	53.0%	46.5%	62.3%	27.6%	36.8%	49.9%
Correlation Coefficient	.73	.68	.79	.53	.61	.71
	-----Behavioral Target Rank-----					
Demo Rank=1	1	6	1	2	3	1
Demo Rank=2	3	7	3	11	4	2
Demo Rank=3	7	20	10	6	7	10
Demo Rank=4	8	17	6	3	9	5
Demo Rank=5	9	51	8	40	6	7
Demo Rank=6	6	4	7	36	8	9
Demo Rank=7	21	112	13	117	15	12
Demo Rank=8	29	45	17	106	11	22
Demo Rank=9	10	5	12	17	23	30
Demo Rank=10	16	27	16	22	14	13
Demo Rank=11	13	10	14	23	52	43
Demo Rank=12	40	93	39	104	34	32
Demo Rank=13	96	25	63	12	19	21
Demo Rank=14	30	19	25	30	31	26
Demo Rank=15	23	76	21	34	18	14
Demo Rank=16	68	12	71	28	54	40
Demo Rank=17	31	29	26	51	38	36
Demo Rank=18	5	13	9	26	12	17
Demo Rank=19	38	56	40	80	33	24
Demo Rank=20	11	16	5	5	36	31

Reasons for Widespread Use of Traditional Method

Given that the "traditional" method for media selection is seriously flawed, the natural question to ask is "Why is it so widely used?"

In part, the reason can be traced to the fact that both television and radio are almost universally bought using this approach. This is because the leading suppliers of broadcast information (Nielsen and Arbitron) only report their data with respect "key" demographically defined target groups.

Although above reason helps explain why television and radio vehicles are selected using the "traditional" method, it does not explain (a) why this method is used to select magazine vehicles, and (b) why the leading sources of broadcast data do not collect and report consumer measures.

There are at least two possible reasons why the "traditional" method is still widely used for magazine selection, even though there are multiple sources (MRI, & Simmons) which enable magazines to be selected on behavioral basis. The first reason is for the purpose of consistency. Since television and radio (usually the predominant components of a media mix) are selected using the "traditional" method, all media must be selected using this method. A second possible reason is that most media specialists are not aware just how poorly target audience membership predicts consumer behavior, and the potential cost-inefficiencies that can result from using a demographic target - especially one that ignores the user and volume contribution of non-target members.

The reason that the leading sources of broadcast data do not collect and report consumer measures probably stems from the fact that such measures are costly to collect and that, compared to magazines, television and radio programs are subject to more marketplace vagaries (e.g., cancellations, time slot changes, preemptions, format changes, introduction of competing programs). Given these vagaries, much of the costly consumer information that is collected would be either useless, out of date, an/or of questionable validity at the time broadcast data were released.

Discussion & Guidelines

The ability to select media vehicles on the basis of a behavioral target is a decided advantage which magazines enjoy over both radio and television. To fully exploit this advantage, however, guidelines and procedures must be developed for selecting behavioral targets, and selecting magazines based on these targets.

Following is a discussion of some recommended guidelines and procedures that can be used for these purposes. A fuller discussion of these guidelines and procedures will be the focus of a subsequent paper.

1. The incidence of the target behavior should not be too low. This is because reliability problems may result when the target behavior is "cross-tabbed" with magazines read. At a minimum, the target behavior would have an unweighted count of at least 500.
2. For low incidence behaviors, there are at least three options:
 - Combine the results of two or more years
 - Change the definition of the target behavior (e.g., change purchasers of expensive car "A" to purchasers of car "A" or its competitors)
 - Use a demographic model to determine each magazine's ability to reach both target and non-target members. When using this method, all groups should be weighted based on their category and/or brand consumption rates.
3. If possible, select magazines based on volume data, as opposed to user data.
4. A strategy that is strongly recommended and has wide application for packaged goods is to select magazines based on their efficiency of reaching category users, with each user weighted to take into account his category consumption rate, and his likelihood of using and/or purchasing the advertised brand. The likelihood of using/purchasing the advertised brand is based on the share of requirements the brand fulfills within the category.

Ted D'Amico

Dr. Ted D'Amico has over 25 years of research experience. During the past 20 years, Ted has devoted his energies to the disciplines of media, marketing and advertising research. Prior to this, Ted conducted research for the City University of New York, investigating the behavioral and neurophysiological bases of learning, cognition, perception and motivation.

In his capacity as a media and marketing researcher, Ted has developed unique and proprietary programs for:

- ❑ assessing brand equity,
- ❑ defining target audiences,
- ❑ pinpointing brand strengths and weaknesses,
- ❑ determining brand switching dynamics, and
- ❑ selecting media vehicles based on behavioral measures.

In addition to developing proprietary programs, Ted has written numerous position and white papers relating to:

- ❑ ascription,
- ❑ sample error,
- ❑ commercial testing services,
- ❑ taste tests,
- ❑ concept tests,
- ❑ media selection based on behavioral measures, and
- ❑ electrophysiological assessment techniques.

Formerly, Ted was Director of Technical Services at FCB/Leber Katz Partners and Scarborough Research, and a Director of Research at J. Walter Thompson. Currently, Ted is a Vice President at Mediamark Research Incorporated, in charge of Marketing Services. Ted has a Ph.D. from the City University of New York in the field of Neuropsychology.