Birch Scarborough

Spring, 1990

Research Review

William E. Engel

Those of us in the primary research business face difficult design decisions which affect the quality of the estimators we intend to produce. The goal we pursue is the reduction of mean square error of the estimators we produce.

During the design process, we must analyze the positives and negatives of the two alternatives for creating estimates from primary research. The direct measurement path demands that all of the activities being measured be reported while the predictive (modeled) measurement path requires only that a piece of the activities being measured be reported, along with a correlative driver. BOTH approaches can produce estimators. Neither should be considered TRUTH. The challenge is to choose the path which, most often, will produce estimates that will be closest to the truth.

In the case of the cume estimate, the classic approach is to use a longitudinal measure. The problem associated with the longitudinal measurement process is the sensitivity of the respondent (the Hawthorne and bias due to non-response). Non-response increases with the numer of times the measurement and the degradation of response is associated with the length of participation required of the respondent. In 1983, Jim Yergin suggested a procedure which followed a modeling path that eliminated much of the bias associated with longitudinal measurement process. This advancement became known as the Yergin Cume Model. The concept and performance of this model was tested and validated by Birch in 1989.

This issue of Research Review addresses the background and theoretical base for using modeled estimators. We also present the second in our series of "Why Response Rates Are Important" as well as the regular column "Trends" written by our newest contributor, Robin Parker, senior technical analyst at the VNU Research and Operations Center.

In our next issue, we will publish a partial summary of results from the Seven-Day Methods Test as well as address a new approach for evaluating radio station positioning within the marketplace.

William E. Engel
President - VNU BIS Operations Group
and Executive Vice President/Operations, Birch/Scarborough

Birch Radio Weekly Cumulative Audience Measurement

Over the past 15 years the measurement of radio advertising has moved toward the evaluation of its Reach (how many different people are listening?) and Frequency (how often do they listen?). This multidimensional evaluation is possible because of the addition of cumulative audience measurements. The cumulative measurement made it possible to separate the basic average quarter hour measurement of radio into Reach and Frequency. It is important to remember that an average quarter hour audience summarizes radio's total impact. In reality, it includes both the Reach and Frequency of radio in a single number. The average quarter hour audience actually reflects the gross time spent listening (average quarter hour times the number of quarter hours in the time period), but fails to separate that gross listening into Reach and Frequency. By knowing either the cume or the average time spent, it is possible to separate that average quarter hour into its two dimensions.

The ultimate goal of any broadcaster is to increase the station's average quarter hour audience. It can be done either by increasing the number of different people who listen or by increasing the amount of time a listener spends listening. In the final analysis, a station is no bigger than its average quarter hour audience. Knowing the two dimensions of the average quarter hour is helpful in determining programming and in planning advertising, but neither dimension by itself is the ultimate measure of the station's audience success. Therefore, despite the growth of Reach and Frequency, the most critical number in any rating book is the average quarter hour audience—it is the total measure of the station's performance.

From the advertiser's standpoint, the decision to buy a station is dependent on the cost related to the quarter hour audience. How many spots to buy is dependent on the advertising frequency objective and the cumulative audience of the station. The first objective of the broadcaster is to get the advertiser to buy the station. How much the advertiser buys is secondary.

To date, Birch Radio measurements have concentrated on the primary objective of radio audience measurement—the average quarter hour audience. This is the all-inclusive measurement of cumulative audience and time spent. The measurement technique employed by Birch Radio is the telephone recall method. Its strength is to measure the average quarter hour audience of the individual. With this technique:

- Only a single member in each household is measured, thus giving the widest possible distribution of households for the sample size. It eliminates clustering of interviews within a household.
- It provides a consistency of recall from day to day and from respondent to respondent which is not possible in a self-administered diary. Every respondent is personally interviewed about their listening and is responding to identical stimuli for basically the same interval span of the listening behavior being measured.
- Cooperation is most dependent on the phone availability of the individual. Each respondent is asked to supply only a limited amount of information. In contrast, weekly diary measurements are dependent not only on initial respondent cooperation, but also continued cooperation in diary maintenance throughout the week.

Birch Radio believes the telephone recall technique provides the best quarter hour measurement of home, and away-from-home listening to radio available today. To this most important and critical measurement of radio listening, Birch Radio now introduces a new technique for measuring weekly cumulative audiences, while retaining the inherent value of its quarter hour measurement.

The new Birch Radio cumes are based on duplication of listening from one day to the next, rather than requiring the respondent to recall listening over a five- or seven-day period. The duplication information is developed by asking respondents who listen to a station within a normal recall period whether they listened to that station on the previous day. The recall task is greatly simplified because the information requested focuses only on those stations they have already mentioned listening to and are familiar with. In essence, recall for the additional day is aided. To further simplify the recall task, the respondents do not have to recall how much listening they did, but only whether they specifically remember listening in each of the dayparts to the station or stations they've already mentioned. With this data base, which gives the percentage of a station's audience that duplicates their station listening over two days, cumulative listening is projected across the week.

The heart of the model for projecting weekly cumes is the distribution of listening by number of days Monday through Friday. The distribution patterns used are based on actual measurements. With this information it is possible to compute the Monday-Friday cume for any two-day duplication level.

To illustrate, here's a Monday-Friday distribution of listening where 20 percent of the audience listens one day out of five, 14 percent for two days, 12 percent for three days, 12 percent for four days and 42 percent for five days. Using probabilities, the daily cume includes 20 percent of the one-day listeners (1 day/5 days), 40 percent of the two-day listeners (2 days/5 days), 60 percent of the three-day listeners (3 days/5 days), 80 percent of the four-day listeners (4 days/5 days), and 100 percent of the five-day listeners. Table 1 below makes these computations:

Table 1

	Weekly Cume	Daily Probability	Daily Cume
1 Day	20	20%	4.0%
2 Day	14	40%	5.6%
3 Day	12	60%	7.2%
4 Day	12	80%	9.6%
5 Day	42	100%	42.0%
Total	100		68.4%

A station with this distribution pattern has an average daily cume that is 68.4 percent of its weekly cume. Or to say it another way, its weekly audience is 1.46 times as large as its daily cume (100/68.4=1.46). This is the weekly turnover rate (T/O).

The next step is to compute the two-day duplication for this distribution pattern. This is accomplished by computing the new cumulative audience the station will attract on the second day. Using probabilities, 25 percent of the remaining one-day listeners will listen the second day, (1 day out of 4), 50 percent of the remaining two-day listeners will listen the second day (2 days out of 4), 75 percent of the remaining three-day listeners (3 days out of 4), 100 percent of the remaining four-day listeners (4 days out of 4), and since all of the five-day listeners listened the first day, there are no new five-day listeners. See Table 2 below.

Table 2

	Remaining Weekly Cume	Second Day Probability	New Second Day Cume
1 Day	16.0	25%	4.0
2 Day	8.4	50%	4.2
3 Day	4.8	75%	3.6
4 Day	2.4	100%	2.4
5 Day	0.0		0.0
Total	31.6		14.2

Since the average daily cume on any single day is 68.4 percent, and 14.2 percent did not listen the previous day, it means 54.2 percent did listen the previous day. In other words the second-day duplication is 79.2 percent (54.2/68.4).

The premise is that a station with a two-day duplication rate of 79.2 percent has a day of listening distribution similar to this and also has the same 1.46 turnover rate. The truth of this premise is supported by the evaluation of actual days of listening and distributions for all types of stations across a wide variety of markets. From all of this data, Birch has developed a table of weekly turnover factors at every two-day application level.

The Birch weekly cumulative audience estimates are developed using these actual radio distributions rather than theoretical mathematical models. The Birch one-day recall has always measured the daily cume. With the addition of the two-day duplication measurement, the daily cume is now projected to a weekly cume with the turnover factor for stations with the same duplication rate.

In actual application, the Birch duplication tables provide two turnover factors—one for those listeners that are duplicated on the second day, and one for those who do not duplicate. When the two factors are applied to the respective duplicated and non-duplicated listeners, the overall turnover factor is the same as outlined above. The analysis of distributions revealed a direct and constant relationship between the turnover factor for duplicated and non-duplicated listeners.

The duplicated listeners the second day are made up of five-, four-, three- and two-day listeners. The unduplicated listeners are made up of four-, three-, two- and one-day listeners. Across the week the one-day listeners turnover 5 times, the two-day listeners 2.5 times, the three-day listeners 1.67 times, the four-day listeners 1.25 times, and the five-day listeners 1 time. Using these turnover factors, Table 3 below computes the five-day weekly audience for the total daily audience and separately for the duplicated daily audience and the non-duplicated daily audience.

Table 3

		Total		Duplicate		Non-Duplicated	
	T/O	1 Day (%)	5 Day (%)	1 Day (%)	5 Day (%)	1 Day (%)	5 Day (%)
1 Day	5.0	4.0	20.0	0.0	0.0	4.0	20.0
2 Day	2.5	5.6	14.0	1.4	3.5	4.2	10.5
3 Day	1.67	7.2	12.0	3.6	6.0	3.6	6.0
4 Day	1.25	9.6	12.0	7.2	9.0	2.4	3.0
5 Day	1.0	42.0	42.0	42.0	42.0	0.0	0.0
Total		68.4	100.0	54.2	60.5	14.2	39.5

continued from page 3

As the table shows, the total audience grows from 68.4 daily to 100 over five days, the duplicated audience grows from 54.2 daily to 60.5 over five days, and the non-duplicated audience grows from 14.2 daily to 39.5 over five days. These relationships produce the following turnovers for each group, which when applied to the daily one-day audience for each group will produce the five-day audience for each group in Table 4 below.

Table 4

	T/O	1 Day (%)	5 Day (%)
Total	1.46	68.4	100.0
Duplicated	1.12	54.2	60.5
Non-Duplicated	2.78	14.2	39.5
			100.0

As pointed out earlier, the Birch five-day cumes are based on the duplicated and non-duplicated audiences rather than the total turnover. This method has the advantage of adjusting for the characteristics of the duplicated and non-duplicated listeners for the five-days.

The computation of the turnovers for the duplicated and the non-duplicated listeners is a far more critical use of the days of listening distribution than computing the total audience turnovers. It is possible that different distributions will produce the same turnover factor for the total audience, however, they will not produce the same turnover factors for the duplicated and non-duplicated audiences. The computation of the duplicated and non-duplicated listener turnover factors provides a validation of the days of listening distributions used to project five-day cumes.

An examination of the relationship of the duplicated and non-duplicated turnovers for all of the days of listening patterns that were actually measured shows an exceptional internal consistency, regardless of daily duplication level, market or station. On average, the duplicated turnover is 40 percent of the non-duplicated turnover. Table 5 that follows reports the frequency distribution of the relationship between the duplicated turnover and the unduplicated turnover. It is a classic normal curve.

Table 5

Duplicated T/O vs Unduplicated T/O	% Cases
32	1.6
33	3.3
34	.0
35	3.3
36	2.5
37	8.2
38	12.3
39	13.9
40	13.9
41	13.9
42	8.2
43	10.7
44	4.9
45	.8
46	1.6
47	.8
48	.0

On the basis of this analysis, it is concluded that the days of listening distribution at any duplication level are the same, and that the true distribution is the one that produces a duplicated to non-duplicated turnover relationship of 40 percent. The measured distributions with a different relationship only varied because of the sampling error in the measurement. For this reason, the development of the turnovers was restricted to those distributions producing the 40 percent relationship.

The development of six- and seven-day cumulative audiences are built on Monday-Friday cumes. The Monday-Friday cumes are extended to Monday-Saturday using the measurement of Saturday's duplication with Friday, and Friday's relationship with Monday-Friday. Subsequently, the Monday-Saturday cumulative audience is extended to Monday-Sunday using Sunday's measured duplication with Saturday, and Saturday's relationship to Monday-Saturday.

All in all, the Birch technique for estimating weekly cume is designed to measure the majority of a station's Monday-Friday cume and project the remainder, using actual radio listening behavior rather than theoretical mathematical models. In reality, Birch measures two days of the Monday-Friday cume. For the majority of stations, this includes 75 percent or more of their total Monday-Friday cume. ■

Research Review is a publication issued by the Statistical Research division of Birch/Scarborough Research Corp., 12350 N.W. 39th Street, Coral Springs, Florida 33065, (305) 753-6043. Subscriptions are free. Reliable sources are consulted for information, but no guarantee is made for accuracy of such information.

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Development Of The Birch Cume Model

William E. Engel and Tom F. Griffin, III, Ph.D.

Modeling of the cumulative, unduplicated audience of various media has been an important area of media research for several decades. The earliest studies in this field were concentrated in magazine and newspaper studies. Later research focused on electronic media. So much attention would not have been focused on modeling research without good reason. But why model the audience rather than measure it directly?

First of all, modeling allows unobtrusive data collection. With modeling, measurement takes place at the beginning of the time period and subsequent behavior of the respondent is not measured. If one did not model, measurement would have to take place during and/or after the time period for which the estimation is desired. If the subject is measured daily or repeatedly, measurements will be biased by the "Main Test Effect" and by the "Interactive Test Effect." The "Main Test Effect" refers to the change in the subject's ability to handle test material. For this reason most standardized test scores, S.A.T.s for example, are scored to account for the fact that students are expected to do better on the test the second time they take it. Therefore, if the respondent is given the same test or task repeatedly, the respondent's performance would be expected to change due to the "Main Test Effect." This change in data received would be expected whether or not a "real" change in the respondent or his behavior or knowledge took place. Data collected by a single telephone interview would essentially be an "after only design," and not subject to the test effect.

Second, the "interactive test effect" refers to the fact that respondents who are contacted prior to measuring their listening behavior become sensitized to the specific subject under study. If we contact a listener and tell them that we are about to measure their radio listening behavior in a few days, they will be sensitized to radio listening. This means that they will respond differently to radio listening opportunities after they are sensitized. They may in fact change their behavior by listening more often or to more stations. The Audits and Surveys "Feasibility Study of Telephone Measurement Radio Using Varying Numbers of Interviews Per Person" (1977), showed that methods involving pre-notification tended to yield more weekday stations per listener than methods without pre-notification, although little difference was found for weekends. For this reason most researchers who track consumer behavior longitudinally (using a consumer panel or perhaps a diary) recognize the need to discard the first few weeks of panel data. This allows the consumer time to "settle down" after starting. Therefore, if a researcher were to use a panel to measure radio listening, it would be appropriate to discard the first week of data collected.

Third, non-response bias is always higher with longitudinal studies. Response is always lower with a longitudinal study than with a single phone call. In both cases the consumer must be asked to participate in the study. Depending on the market, 40 to 80 percent will agree to participate. Almost all of the respondents will complete an interview conducted immediately, unless it is very long. If call-backs or diaries are required, it is inevitable that a portion of those who agreed to participate will never be reached again, change their minds, lose the diary or forget to fill it out. From a behavioral perspective, those who fail to complete the study after agreeing to participate will skew towards the busier people in the sample. Those who do complete the study will skew toward the less busy (such as retired, or unemployed people, etc.)

The model of Dr. Tom Griffin, tested by Birch Radio Research in 1983, was based on the well-accepted Markov Chain model, used to project shifts in brand shares. The model used the known duplication in one-day listening that was collected by Birch at that time. This information was used to construct a "probability of duplication table." The table contains the probability that a person in a given demographic group would listen to one station given that we know they listen to another station. For example, if we know that 10 percent of the respondents in a "demo" who listen to WAAA also listen to WBBB, we can say that there is a .10 probability that an individual respondent who listens to WAAA also listens to WBBB. We can process this information on known listeners to WAAA through a Markov Chain and compute the expected number of listeners to WBBB after five, six or seven days.

This method tended to understate cume audiences because the single day of listening that was measured did not capture enough of the breadth of listening of individual listeners to be able to project seven times the period measured. It was also projected and computed at the respondent level which meant that the software would run for hours, sometimes days, for each market. It did not appear from this experience that one day of data would be sufficient to project a weekly cume audience.

The Yergin model which followed, approached the problem from the opposite side of the duplication table. Two days of the data were collected, rather than one, and the information collected was whether or not yesterday's listening to a specific station was duplicated the day before yesterday. Obviously, if the percent of duplicators from one day to the next is very high, the station's cume audience will build very slowly as we project to a week. If the percent of duplicators is low, then this implies that the station's audience is made up primarily of different listeners every day, and the cume will build rapidly as we project to a week. Once the rate at which the cume builds is known, all that remains is to determine the shape of the function that best fits the known one-day and two-day cumes, and the projected five-day, six-day and seven-day cumes.

This method produces remarkably stable estimates because the projection period (five, six or seven days) is only two and one-half to three and one-half times as long as the measurement period (two days). Also, it is relying on actual duplication of the stations listened to the day before the interview. The model has been extensively studied by Birch. This testing included two "diary study" validations, one in Washington D.C. and one in Fort Lauderdale, Fla.

A highly stable relationship between turnover and duplication percentage is the heart of the Yergin model. To test the stability of this model, the Birch model was used to project cumes from an Arbitron "mechanical diary" for Boston, Winter '85. Table 1 below contains the published Arbitron cumes as they compare to the cumes modeled from the Arbitron data with the Yergin model. The conclusions are obvious.

Table 1

Arbitron Boston MSA - WI '85
Monday to Friday - Persons 12+
Top 20 Stations

Call Letters	Cume	Modeled Cume	Diff.
WBZ	597510	594288	-.01
WBCN	510837	512193	.00
WEEI	481873	488065	.01
WHDH	443754	443240	-.00
WXKS	439787	445257	.01
WHTT	407580	407640	.00
WROR	401896	389930	-.03
WJIB	390043	397788	.02
WRKO	320629	325398	.01
WZOU	311619	314814	.01
WSSH	288761	279848	-.03
WVBF	278819	273907	-.02
WMJX	243902	238576	-.02
WZLX	221666	223519	.01
WAAF	213574	210219	-.02
WGBH	163388	166595	.02
WBOS	162636	163201	.00
WCRB	151670	148905	-.02
WBUR	133905	136150	.02
WCGY	110300	108611	-.02

Why Are Response Rates Important?

Charles Palit, Ph.D., and William E. Engel

The response rate is an important measure of the quality of a sample because it defines the percentage of the population to which the sample results can be projected with a good sound statistical bridge. For example, if the sample has a 100 percent response rate, then projection of the sample results to the whole population can be made with great confidence. On the other hand, if the response rate is 30 percent, then a strict statistical inference or projection can only be made to 30 percent of the population. In truth the sample tells us nothing about 70 percent of the population. For this reason statisticians view the response rate as an extremely important measure of the quality of sample data. The lower the response rate, the more uncertain is the validity of our estimates from the sample.

How A Poor Response Rate Can Distort the Truth - An Example

Suppose we are studying an area which has exactly two zip codes. And suppose for simplicity that the size of the population in each zip code is the same. Suppose that in zip code No. 1, 20 percent of the population listen to classical music and 80 percent listen to country music. In addition, let us suppose that in zip code No. 2 the situation is reversed; i.e., 80 percent of the population listen to classical music and 20 percent listen to country music. Finally, let us suppose that the propensity to respond to the survey differs for classical listeners and country music listeners. Specifically, let us assume that for classical music listeners the propensity to respond is .10, i.e., 10 percent of the classical music listeners will respond to the survey; while for country music listeners the propensity to respond is .90, i.e., 90 percent of country music listeners will respond to the survey.

Now if we randomly pick 100 persons from each zip code area as our sample, then the sample design and its field results are as shown in Table 1.

Table 1

Sample Design and Expected Field Results for 100 Persons per Zip Code Area

Zip Area	Sample Size	Expected dn for Listening Preference	Propensity to Respond	Expected Complete
1	100			
Country		20	.90	18
Classical		80	.10	8
Total		100		26
2	100			
Country		80	.90	72
Classical		20	.10	2
Total		100		74

For this sample design the non-response bias is obvious. But suppose the sampler decides to compensate for the differences in response from the two zip code areas by inflating the sample in both zip codes to achieve 100 completed in each. The sample size in zip code No. 1 would become:

$$100/.26 = 385$$

And the sample size in zip code area No. 2 would become:

$$100/.74 = 135$$

A summary of the revised sample design and its expected field results is shown in Table 2.

Table 2

Sample Design and Expected Field Results for 100 Persons per Zip Code Area

Zip Area	Sample Size	Expected dn for Listening Preference	Propensity to Respond	Expected Complete
1	385			
Country		77	.90	69
Classical		308	.10	34
Total		385		100
2	135			
Country		108	.90	97
Classical		27	.10	3
Total		135		100

The second sample design produces geographically balanced results for Number of Persons and an overall response rate of:

$$(200/443) \times 100 = 45\%$$

Remember, this means that the sample tells us nothing about 55 percent of the population, except that they do not respond to our survey technique.

Is There A Non-Response Bias?

From the total number of country music listeners in the sample, an estimate of the percent of persons listening to country music in the study area is:

$$(166/200) \times 100 = 83\%$$

Similarly, a sample estimate for the number of persons listening to classical music is:

$$(34/200) \times 100 = 17\%$$

In fact, the percent of persons in the area listening to country music is 50 percent, indicating that the design produces a non-response bias on the order of 30 percentage points. We will see later that increasing the sample size will do very little to reduce this bias.

Hidden Non-Response Biases Can Produce Serious Errors

Suppose an independent cluster analysis based on Census data, etc., resulted in zip code area No. 1 being classified as cluster group No. 1, and zip code area No. 2 as cluster group No. 2. Let's call cluster group No. 1 the Champagne group and cluster group No. 2 the Beer group. If we translate the results of the second design into cluster groups, then we will have the results in Table 3.

Table 3

Comparison of Cluster Group Frequency from Sample and Census

Cluster Group	Sample	Census
Champagne	50%	50%
Beer	50%	50%

Now if we analyze the data further to find out what type of music is preferred by the Champagne group, we will conclude that the Champagne group prefers to listen to country music just like the Beer group. The truth, however, is that the Champagne group prefers to listen to classical music. Errors of this type can lead to incorrect allocation of resources.

Note that in the proportionate design described by Table 1 the comparison of the cluster group frequency and the sample clearly indicates the response bias problem.

How Much Can We Reduce the Non-Response Bias by Increasing Sample Size?

The answer in most cases is very little. To illustrate this, an estimate of the sample error is required. For simplicity, we will use a rough approximation to the sample error produced by:

$$\sqrt{\frac{(.83)(.17)}{200}}$$

This produces a rough estimate of the sample error of the proportion of persons listening to country music in the area. In terms of percentage points, the sample error is 2.66, producing an approximate 95 percent confidence interval of:

$$6.70\% \text{ to } 88.32\%$$

The width of the confidence interval is about 10.6 percent. The bias is about 30 percent. Increasing the sample size will shrink the width of the confidence interval, but will not remove the bias. ■

Trends . . .

Communication drives progress. Communication leads to innovation. With the availability of respondent databases, information can be communicated to marketers with such timeliness that marketing decisions based on the targeted consumer can be made in minutes.

No longer must programming, and advertising planning and buying be based on the traditional age/sex demography. On the contrary, databases that offer qualitative data can provide broadcasters, retailers, and advertisers with enough information to not only determine who the target market is, but what, where, and how often it buys.

The availability of respondent databases has effectively opened up the real strength of media -- the ability to target and customize. The solution Birch/Scarborough offers to its clients is a clear picture of who the target is and is not, as well as that segment of the market being captured by the competition. By selecting designated demographies, geographies, and dayparts, clients have before them a portrait of their audience with just the touch of a few keys. And what better strategy leads to profitability than marketing a product to consumers who demand it?

In this age of information, Birch/Scarborough has met the communication challenge by using automation in such a way that its clients are served more effectively and efficiently. And as businesses continue to rely on the flexibility and power of integrated systems, Birch/Scarborough will continue to meet the challenge by providing its clients with the easiest and timeliest access to all Birch/Scarborough quantitative and qualitative data. ■

R&R RADIO & RECORDS

GOOD NEWS/BAD NEWS

Birch Scarborough Research

What Outlyers Mean To Your Ratings Story

By Bill Engel

Good news – the latest ratings report is in. Bad news – your numbers are up. Bad news?

Before you congratulate yourself, you'd better dig a little deeper into the actual interviews. What at first glance looks like an up book could actually be flat or even a downtrend, apart from a few "lucky breaks." These lucky breaks come in the form of heavy listening that exceeds your station's normal range of listening.

Researchers call these lucky breaks "outlyers." Outlyers are observations (interviews) that produce information which is outside the normal range of expected values. For example, if you survey soft drink users and run across someone who drinks 36 soft drinks a day (yes, they really do exist), that individual will pump up your average.

The same applies to radio listening. Approximately 3% of the population could be classified as "heavy listeners." These people spend far more than the average amount of time listening. (No, I'm not going to tip you off to the magic amount, because we follow special procedures to examine such interviews. Giving away the trigger point would be like the IRS publicizing its "audit limits.")

Conversely, you should also be on the lookout for holes in the normal distribution of quarter-hour listening for your station. In this case, absence of complete distribution creates a lighter-than-normal quarter-hour count.

Statistical Freaks

There are certain givens you must accept when working with random samples. These include the fact that everyone in the population being measured is a potential survey participant. So the people who consume 36 cans of pop each day, the people who watch TV for 18 hours a day, and even the 15-minute-a-day (light) radio users are all potential participants in our random samples.

When they do participate, they represent "rare" population groups within the measurement universe who bump the numbers around.

Consider: if a respondent reports 18 hours of listening per day to your station and your average listener reports only one-and-a-half hours per day, then that "heavy listening" respondent's presence in the group is equal to receiving about 12 extra in-tab mentions (or getting 12 more people to report an average amount of listening to your station).

When these situations occur, we can normally spot them in the 12+ numbers by doing a quick turnover calculation (cume divided by quarter hour) or TSL check (AQH times the number of quarter hours in the time period divided by cume). By trending these calculations over time, you can establish benchmarks to assist you in spotting the bad news within the good news.

If your ratings go up while maintaining consistent TSL and turnover, then your increase has occurred as a result of cume audience build. Our analysis in this case would be that the good news is really good news. The station has grown in its appeal while maintaining the same average amount of listening per in-tab.

In-Depth Method

These generalized calculations only assist you in determining where problems may lie. To get at the core of the problem, I recommend a definitive analysis of your station audience. This analysis requires viewing the raw data itself, or better yet, tabbing from a Birch file listing of your interviews. The method requires a simple tally on your part. I call this tally the "Station Frequency Distribution of Quarter-Hour Listening."

The tab is simply a count of the number of interviews within a set group of quarter-hour ranges to your station. The count is conducted by demo to set a normative curve of listening. (See the accompanying chart.) Once the curve is drawn, you can establish your station's outlyers and determine what your expected range of listening should be. This curve can tell you more about your station in a glance than most full-fledged listener preference polls.

Notice in the distribution that two in-tabs appear outside the normal range of listening. This condition causes the heavy listening in-tabs to be outlyers (lying outside the normal range of listening for station WXXX).

In this particular case, the two outlyers represent more than six times the listening of the normal WXXX listener. This increases the total amount of listening to WXXX without increasing the cume, which causes the station's rating, as well as its TSL, to rise. In fact, in this case the two outlyers account for over 6% of the station's total quarter-hour mentions. Obviously, with contributions this large, outlyers can have a misleading effect on a station's audience.

> "The people who consume 36 cans of pop a day, the people who watch TV for 18 hours a day, and even the 15-minute-a-day radio users are all potential survey participants."

For example, a station which usually enjoys an average of two outlyers per report may conclude erroneously that its audience is down because the two outlyers didn't materialize in the recent sample. Conversely, an additional outlyer or two to a station's typical distribution may lead to a ratings success story where none is warranted.

Elusive Light Problem

Don't forget that heavy listeners are only part of the problem. Their counterparts, light listeners, are harder to detect because they don't necessarily stand out in the distribution like heavy listeners do. Instead, they're embedded within the distribution and show up as heavier than usual frequencies (tallies) to the lower quarter hours of listening columns.

Referring to our table again, if the number of in-tabs contributing one to four quarter hours increases at the expense of the longer timespans, then the TSL averages would go down along with your AQH audience. For this reason, trending your station's quarter-hour distribution should be a regular part of your rating analysis procedure.

As you can see, understanding your station's "usual" distribution of audience by quarter-hour contribution can be invaluable in your analysis of a ratings book.

It's important to remember that a minority of people do report long timespans of listening. It's equally important to realize that shorter-duration listeners, while less of an overall "ratings problem," can also affect your decisions. Most stations will normally see a little of both in their month-in and month-out distributions. Observing your distributions over time will enable you to determine whether or not your current estimates are really "good news" or "bad news."

Searching For Outlyers

Station WXXX Frequency Distribution Of Quarter-Hour Listening

Number Of Quarter Hours	1-4	5-8	9-12	13-16	17-20	21-25	26-29	30-33	34-37
Teens	1								
18-24	2	7	13	6			1		
25-34	5	11	21	7	2				1
35-44	6	9	12	1					
45-54	6	2							
55-64	1	3							
65+	1								

Station WXXX has:

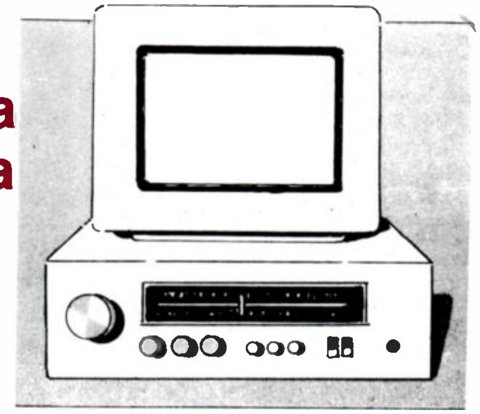
Its highest concentration of listeners in the 25-34 age demo, comprising 39% of their total mentions and about 42% of the total number of quarter hours.

The majority of those people 25-34 (18% of the total in-tab) listen between two and three hours per day (nine to twelve quarter hours). This group represents about 46% of the station's total quarter hours.

GOODBYE, DEMOGRAPHICS

Multimedia Qualitative Data Define Future Use Of Media

By Bill Engel



FM radio's mid-'70s emergence as a viable mass medium brought a revolution greater than the one heralded by TV's introduction in the early '50s. Almost overnight, most markets saw the number of competitive stations double. In retrospect, the fragmented radio audience revolution was a forerunner to the '90s and media's future.

What was once the age of mass media has given way to a period of "micromedia." Both print and television are experiencing a revolution of greater choices and narrower targeting. What does the future hold for media choice? Let's examine some radio history for a look into the twentieth century's closing act – an act we could title, "New Dimensions In Media Evaluation."

According to George **Armstrong**, co-founder of **Storz Broadcasting** and a leader of the independent radio revolution in the post-TV era: "Radio became largely a local medium to combat the loss of network revenue." It's no surprise that both network TV and forms of mass media print have seen some national dollar erosion during these early stages of micromedia.

Radio has struggled during the past 15 years, with varying amounts of success, to better quantify the medium's dimensions.

"Where quantitative estimates were once enough, the complex media strategies of the '90s defy classic age/sex descriptors."

Westinghouse Group W's pioneering use of radio's reach and frequency as a selling technique in 1968 helped define the medium in terms other than a multiple impressions vehicle. But just as planners became comfortable using the medium for strategies that required market reach (cume), along came the FM explosion. Fragmentation – a description that doesn't fit the concept of market reach – caused more havoc than TV's introduction ever did.

The '70s and early '80s were dominated by large broadcast groups which employed consultants to build huge market shares. The mid- to late '80s saw greater ratings parity as new and stronger broadcast groups emerged to challenge existing powerhouse stations. One buyer in Los Angeles recently asked, "What do I do now that everybody has a two share?"

Reach, Frequency Decisions

How do you define the radio medium? It's reach-capable if you buy the right combination of stations. It's frequency-capable if you buy the right combination of stations. It segments the market if you buy the right combination of stations. Let's take them one at a time.

Greater segmentation has meant more cross-station duplication as listeners continue to tune in to more than two stations per week, on average. This clustering of relatively similar stations allows frequency impact when the stations are paired in a tactical sense.

At the same time, the clustering properties that aid the building of frequency can be reversed. The pairing of two or more dissimilar stations will build target-market reach. The strategy of balancing clusters of duplicators with clusters of dissimilar stations can achieve the impact of a solid schedule frequency combined with an acceptable target-market reach.

While the strategic uses of the medium are clear, it's in attempting to implement those strategies that users flirt with a nervous breakdown. Where quantitative estimates were once enough, the complex media strategies of the '90s defy classic age/sex descriptors.

"The emergence of microcomputer systems for qualitative audience data in late '89 has opened the data to systematic usage as a regular part of a radio strategy."

In "The Clustering Of America," **Michael Weiss** devotes a whole chapter to "The Myth Of The Average American." He writes: "In the last generation, American culture has become increasingly fragmented in a megatrend process that noted author and lecturer **John Naisbitt** calls decentralization. The mass market has split apart, shattered by such shifting demographics as double incomes and divorce rates."

"What once was the age of mass media has given way to a period of 'micromedia.'"

Quantitative estimates were fine in the days of concentrated lifestyle groups within narrow sex/age demographics. But, says **Bob Galen**, former Director/Research of **Blair Radio** and the **RAB**, "Today . . . 25-54 in most households is a family reunion."

Incorporating Segmentation Stats

The segmentation of radio has brought with it an explosion of information in the form of extended demos, product usage, retail shopping data, and cross-station duplication. While this audience segmentation information has been available on a syndicated basis for the past five years, few had incorporated the data into their media plans before this year.

Available only in printed form until recently, the sheer volume of qualitative information prevented its regular use within media plans. The emergence of microcomputer systems for qualitative audience data in late '89 has opened the data to systematic usage as a regular part of a radio strategy. These sophisticated delivery systems enable a planner or buyer to evaluate multidimensional radio strategies and tactics, test reach/frequency hypotheses, and create buys that use both quantitative and qualitative data.

Multiple station reach and frequency against proposed schedules are now possible against high-income owners of foreign cars who live in a specific set of zip codes and have a propensity to shop at Neiman-Marcus.

While radio has pioneered the use of qualitative data to carve out market niches, the same data is available for newspapers, TV, and certain national magazines. The strategies developed to use the fragmented radio medium to its best advantage can – and will – be used to deliver target-specific markets for both print and TV/cable. Microcomputers' delivery of multimedia databases already allows cross-media comparison and scheduling. As demand grows, so will the complexity and variety of the systems.

"One buyer in Los Angeles recently asked, 'What do I do now that everybody has a two share?'"

We have learned much from our use of radio over the years. It's now time to apply those strategies to each other medium individually, and all media collectively, with respect to target delivery. As Weiss says, "In their effort to reduce the nation to an average American household, market researchers have whittled away the variables that truly define the American character . . . the statistical average is often a vacant place in space."

Say goodbye to demographics – and hello to multimedia qualitative data in the new age of micromedia!

Qualitative Data: Tooling Up For The '90s

Qualitative data – income, education, occupation, shopping, and product purchase information – is rapidly becoming the weapon of choice in the radio sales arsenal. The right qualitative data, properly applied, is money in the bank. But it also lends itself to a number of valuable programming applications.

Multimedia Magic

Multimedia databases may well be the most powerful decision-support tools ever created for programmers. And today, thanks to software systems developed by **Tapscan** ("Quali-Tap") and **Strata,** you can create customized data breakouts on your own PC.

What is multimedia data? Just what the name implies: estimates of radio, TV, and print audiences, all delivered from the same respondent so that duplication and cross-tabulation analyses can be made. (See illustration, upper right.) Qualitative multimedia databases open windows into radio audiences, shedding light on lifestyles, product service consumption, and use of other media.

Using single-source multimedia data, for example, you can access data on all men 25-54 in your audience and determine the percentage of those men who watch the Wednesday 11pm news on Channel 2. Or read the Sunday gazette. Or watch **David Letterman** *and* read the Sunday gazette. All of which provides excellent promotional intelligence.

Beyond that, each respondent also provides a wealth of profile data such as individual and household income, product and service purchases, and retail shopping patterns. In the case of **Birch/Scarborough** databases, more than 400 different local categories are provided. (See accompanying sidebar.)

Here's an example of some parameters you might plug in on your PC: unmarried women 18-34 with individual incomes of $75,000+ who hold active health club memberships and reside within particular zip codes.

Once you've isolated this select group, you can find out where these women shop for groceries, where they dine, what their favorite vacation destinations are, as well as which credit cards they own, the types of cars they drive, and the number of movies they've attended in the past three months. Most importantly, you can also learn which radio stations they listen to.

This rifle-shot approach to targeting is known as market segmentation, and is a powerful paradigm for strategic and tactical planning. In simple terms, market segmentation follows a four-step process: identifying the target, researching the target, delivering to the target, and advertising/promoting to the target. Multimedia data plays a critical role in each step.

Identify The Target

You may have already done perceptual research to find an available niche, to discover your competitor's Achilles' heel, or to isolate a specific target audience you have in mind. Multimedia data can *still* help you better hone in on your target.

Some important considerations:

- Geography: what are the key counties? The key zips?
- Duplication: what other stations does the target audience listen to? How much time (TSL in quarter-hours) are your listeners spending with key competitors?
- Socioeconomics: what are the income, educational, and occupational profiles of your target listeners?

Each of these factors can play a role in how you competitively position the station and help determine where you place promotional emphasis.

Research The Target

Once you've selected an optimal target audience, the next step is to find out what really makes that audience tick. Think about how these factors might affect formatics and presentation:

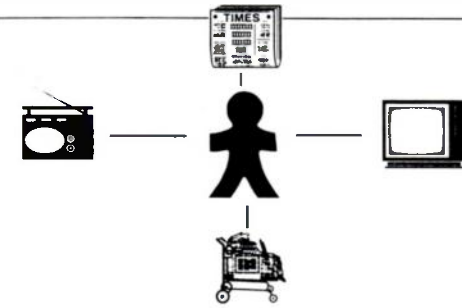
- Life stage: Married? Divorced? Number of children in the household? Ages of children? Own or rent?
- Lifestyle: Propensity for rock concerts, sports events, dining out, international travel?
- Consumption patterns: Retail shopping by store and mall? Auto owned by type? Own bank credit card; department store credit card?
- Media use: Cume and AQH by TV show? Average issue and one- and two-day newspaper cume readership?

All of this data helps create a composite view of your target listener. And perhaps more significantly, it gives you critical insights that can clearly define promotional thrust (types of contest prizes), on-air topicality (raising kids vs. raising hell), and media vehicles for advertising and promotional tie-ins (which TV weatherman is best suited for your morning show).

Deliver To The Target

Using the market segmentation techniques described here, you can create a road map to winning ratings. You know your target. You know a lot about how they live, and you know which media channels you should use to reach them (including the "hot zips" for direct mail).

Now it's up to you to distill all of these informational ingredients into an on-air brew the target listeners will lap up in mass quantities. If you've asked the right questions at the beginning of the process, converting research into a plan of action will come naturally.



Each respondent provides listening, viewing, reading, shopping and product purchase information

Multimedia Consumer Profile

Listed below are examples of multimedia database categories.

Demographics Menu

- Sex
- Household Size
- Age
- Number of Adults
- Marital Status
- Presence of Children
- Education
- Age of Children
- Principal Food Shopper
- Place of Residence
- Occupation
- Home Ownership Status
- Individual Income
- Type of Dwelling
- Purchase Decisions
- Value of Home
- Race
- Length of Residence
- Voting Behavior
- Household/Personal Income
- Political Affiliation
- Languages Spoken
- Chief Wage Earner

Shopping Information

- Department Stores
- Hardware/Building Supply Stores
- Discounters/ General Merchandise Outlets
- Shoe Stores
- Supermarkets/Convenience Stores
- Drug Chains
- Clothing/Specialty Stores
- Jewelry Stores

Product & Service Data

- Domestic and Foreign Travel
- Automotive
- Airline Travel
- Alcoholic Beverage Consumption
- Cruises
- Soft Drink Consumption
- Movie Attendance
- Financial Services
- Restaurants-Fast Food & Other
- Recreation/Leisure Time Activities
- Credit Cards
- Cable Television

TV CASE STUDY

Reaching For Right Media Vehicles

Whether your advertising strategy is to reinforce hasics (call letters and dial position), establish a brand image, or build awareness for your morning show, it's important to select media vehicles that effectively reach your target.

To demonstrate the value of multimedia data, let's pretend we're planning a television campaign designed to build awareness of a new Miami/Ft. Lauderdale AOR, and the target audience is the current AOR top dog's listeners.

In order to illustrate the differences in viewing between individual station audiences and total potential audience, we selected 12 television programs for purposes of comparison:

Adults 18-49 Ranked By Cume

All Respondents	*New AOR's Listeners*
WPLG-TV Early News	"L.A. Law"
WSVN-TV Early News	"Thirtysomething"
"The Cosby Show"	"The Cosby Show"
WTVJ-TV Early News	WSVN-TV Early News
WPLG-TV Prime Access	WPLG-TV Early News

As can be seen, all TV viewers — even within a target demographic like 18-49 — aren't necessarily created equal.

Birch Scarborough Research

BACK TO BASICS

Understanding The Numbers

[redacted]

July 28, 1989

Ratings reaction season is here again, with responses ranging from Dom Perignon celebrations to mass firings. So it's an appropriate time to revisit the basics on understanding the numbers.

Over the years, we've found some wild "interpretations" in the mailbag – like the GM who was ready to fire his PD after the third consecutive "down book." The station's 12+ five-book trend was 9.8-11.1-10.9-10.5-9.9. Fortunately, we talked him out of it – and the station snapped out of its "losing streak" with a solid 10.8 in the next book.

Then there was the owner who was preparing a major format change after his station's rank dropped from third to sixth in adults 25-54. He hadn't noticed that his AQH rating of 2.5 was the same in both books, while two other stations in noncompetitive formats had enjoyed unusual upward spikes.

What's A Trend?

To help everyone avoid similar unnecessary heartburn (and heartache) owing to ratings misunderstanding, we've put together a review of the essentials. Experienced ratings users may leave the room. (But to avoid potential embarrassment if I happen to see you at the NAB and ask about one of these areas, you're welcome to read on.)

At **Birch/Scarborough** we define a trend as "directionally similar recurring and statistically significant changes in estimates." Big words, simple concept: if the numbers are consistently increasing (or decreasing) over at least three reports and not by pure chance, you've got a trend.

There are three inherent forces (having nothing to do with competitive on-air or promotional activity) that profoundly affect movement of estimates in radio ratings reports:

- sample size
- size of station audience
- seasonality.

Basic Terms

And now, a few definitions:

• **Standard Deviation** – a means for judging the significance of a change in the numbers. Without getting technical, standard deviation provides a range within which a user can be confident that the "true" estimate would fall if a full census were conducted.

• **Sample Size and Size of Audience** – Key determinants of the theoretical error range around an estimate: the larger the sample, the lower the error. The same is true of individual station estimates; the larger the audience, the smaller the relative statistical bounce.

A simple formula is provided in the back of each Birch report that lets you quickly compute this error range at the 95% confidence level; i.e., the range within which estimates would fall in a census in 95 out of 100 cases. For example, a station with a cume rating of 21.5% in a sample of 1032 interviews would have an error range of 18.9% to 24.1%. Therefore, a subsequent drop to 18.9% in a similar-sized sample would *not* be considered statistically significant – nor would a rise to 24.1%.

Consider the earlier example of the GM who was ready to fire his PD after three consecutive "down" books. Even with a sample size of 8856 (the spring '89 Birch Quarterly Summer Report sample for New York), the error boundaries around a 10.1% AQH share (assuming a Persons Using Radio AQH rating of 18.0%) would be 8.5%-11.6%. Our GM's market report contained 3000 interviews, so *none* of his station's changes over the five-book trend period were statistically significant.

• **Seasonality** – Another important factor that wasn't considered by this worried GM. The 9.9% AQH share scored by his station was directly in line with the results achieved in the same previous-year quarterly report.

Seasons of the year affect lifestyles and, in turn, radio listening patterns. For example:

- CHR is strongest in summer and spring. Summer teen availability provides a huge boost to overall ratings.
- News/Talk is strongest in winter in Northern markets. Weather, traffic, and news boost listenership.
- Easy listening is biggest around the Christmas season, when soft, traditional holiday music attracts tertiary listenership.
- Sports stations score best with baseball. Ratings (even outside of nights) are boosted through the roof at the start of the season.

"Before leaping from the 22nd floor after a down book, look at ratings in your market from previous years to see if a seasonal pattern exists."

The moral: before leaping from the 22nd floor after a down book, look at ratings in your market from previous years to see if a seasonal pattern exists.

• **Persons Using Radio Listening Levels** – At the bottom of each page is an estimate of the aggregate number of listeners to radio in general, including attributed listening and listening to public radio. This is your market's overall radio report card and it's generally stable from quarter to quarter. The AQH PUR defines the size of the radio pie; when the AQH PUR changes, each individual share point is similarly revalued upward or downward.

An upcoming column will provide a few tips on reading and understanding specific information in the books and examine the ratings impact of programming elements directly under your control.

Take It In Stride

In the meantime, two closing thoughts. If you had a great book, make certain it really is great (statistically significant upward movement unrelated to seasonal patterns). Even if it truly is great, take it in stride. Remember the law of gravity.

If you had a bad book, ditto to the above on significance – and if it's truly bad, don't take it too hard. Some of the best consultants in the business would never have gotten their start without the help of a truly bad book!

Factors Beyond Your Control

Believe it or not, there are some things over which a programmer can't exert control:

• **Format competitors.** New direct format competition, an effective 500-GRP TV campaign by an in-format competitor, the tightening of a rival's playlist, or the introduction of a strong new competing morning show are all factors that can hurt your ratings — even when you're sounding your best and promoting effectively.

• **Other radio competition.** During the past three years, many Country stations were shocked by the large amount of audience they were sharing with Oldies stations. In many markets, gains in Oldies audiences came directly at the expense of established Country outlets.

• **Changes in employment levels.** A high level of unemployment boosts midday listening levels. Also, not everyone works in an office, and most people can't or don't listen regularly while at work.

• **Unusual news or weather events.** I once knew a South Florida News/Talk station exec who prayed for hurricanes. The peak season (mid-September through mid-October) coincides with the start of the fall sweeps.

• **Cultural influences.** Contemporary music stations are at the mercy of the culture, the artists, and the record company strategists. A big movie with a popular soundtrack can produce a wealth of material that can power contemporary music stations for months. This works in reverse as well. When the hits aren't hot, listeners look for alternatives (like TV or CDs).

• **Population shifts.** There are more 35-44s today, by far, than in 1979. And there'll be more 45-54s in 1999 than today. While population shifts are glacial influences on radio overall, keep tabs on the population bases in each demo cell in your report. The ratings services update their populations annually. And changes in the population distribution drive the weighting, which can have an immediate impact on your estimates.

• **Radio Industry Influences.** The radio industry is famous for providing too much of a good thing. The format graveyard is full of tombstones to copycat programming: Disco, Urban Country, Modal Rock, etc. Overexposure of certain types of music inevitably leads to listener burnout, and the fallout can hurt everyone. When an avid radio listener (who tunes in both AC and CHR, for example) decides he's heard enough Classic Hits to last a lifetime and acquires an in-office CD player and a collection of folk music CDs, everyone loses.

R&R RADIO & RECORDS

Birch Scarborough Research

Audience Sharing: A Programmer's Tool

Building Cume Is Easier When You Know Where To Look For It

By William Engel

For years, programmers have conducted expensive perceptual studies, invested in focus groups, and generally turned the world upside down in their quest to determine their stations' positions in the marketplace. But these programmers traditionally measure the success of a programming strategy solely by demographic ratings. They ignore a particularly important tool: audience sharing.

"Short-term gains in station cume may be realized by successfully targeting secondary competitors' audience, while not losing sight of primary competitors."

Audience sharing is the estimate of how much of your cume audience listens to a competing station – and how much of that competing station's audience listens to your station. The critical information isn't the cume audience shared with your primary competitor. It's the cume audience shared with every other station in your market. And once you know where you really stand in the market, it's a lot easier to get a leg up.

Two-Dimensional Plotting

On the surface, it's not an easy task to look at the 40 sets of numbers which describe audience sharing between stations in a typical market. There is, however, a simple procedure to evaluate your market position.

"Once you know where you really stand in the market, it's a lot easier to get a leg up."

It's called two-dimensional plotting, and it involves plotting the audience duplication between your station and others graphically – giving you a clear, visual representation of your market's competitive environment.

The information you need to undertake this task is available at your fingertips within your Birch Quarterly Report. If you look up, say, KBIG/Los Angeles, and scan the vertical column, you'll see that 11.6% of its audience also listens to KFWB; 23.9% also listens to KIIS-FM; and 8.5% also listens to KJOI. But how much of each competitor's audience listens to KBIG? That's also listed – horizontally. Just read across. You'll see that 6.8% of KFWB's audience also listens to KBIG; 8.4% of KIIS-FM's audience also listens to KBIG; and so on. All these figures are represented graphically in the upper right box on this page.

Plot It Yourself

Now look up and read through your station's column in the cume audience duplication section of the Birch report. Once you've found your station's figures, pull out of sheet of graph paper. Now you're ready to plot your station's audience sharing figures on a similar graph.

• **Draw a horizontal line on your graph paper.** Mark equal increments each representing five percentage points of shared audience. This line will be used to plot what percent of your station's audience also listens to competing stations (each interval represents 5% of your station's audience).

• **Next, draw a vertical line from the origin of the graph.** (That's the zero point on the horizontal line.) Just as you did with the horizontal line, mark increments of 5% along the vertical line to indicate your competitors' shared audience with your station.

• **Using the Birch report audience duplication figures, plot the intersecting points.** In other words, if 5% of your station's audience also listens to a particular station, find the 5% interval on the horizontal line. If 10% of that station's audience also listens to your station, find the 10% interval on the vertical line. If you were to draw lines from those points located on the vertical and horizontal lines, where would they meet? That's where you plot the competing station.

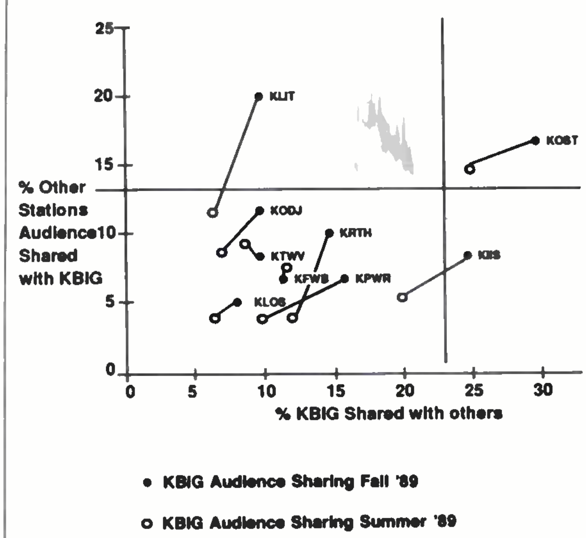
The graph in the upper right box includes a second set of reference lines dividing the graph into quadrants. These quadrants help convey a better picture of KBIG's competitive environment. You can divide your graph into such quadrants as well.

Quadrant One

Stations which appear in the upper right quadrant are considered to be primary competitors with the object station, in this case KBIG. In this quadrant, the stations share at least 15% of their individual audiences with each other.

Quadrant Two

The upper left quadrant contains stations which are the object station's secondary competitors. Stations within this quadrant share at least 15% of their audience with you, while you share less than 15% of your audience with them. If your strategy is a healthy cume, you had better have a number of stations in this quadrant.



Quadrant Three

Your tertiary competitors will appear in the lower left quadrant. Within this quadrant are stations which don't share significant audience with the object station (and with which the object station also does not share significant audience).

"Audience sharing is the estimate of how much of your cume audience listens to a competing station — and how much of that competing station's audience listens to your station.

As a plotted station in this quadrant moves toward the other quadrants, competitive ramifications become more significant. Watching movements within this quadrant can serve as an early warning device for potential problems in the next book. (Note: if one of your format competitors shows up in this quadrant, you can bet there's been a ratings glitch – or your competitor is in big trouble.)

Quadrant Four

Last, but not least, is the "big trouble" quadrant. As Hulk Hogan might say, competitors in this lower-right block have you "pinned." These competitors share a small percentage with your station, while you share a great percentage with them. Your station becomes a feeder station for that competitor's cume.

Plotting Multiple Surveys

While single survey plots provide an interesting picture of the marketplace in the most recent quarter, it's more revealing to plot two or more surveys on the same two-dimensional plot. In the upper right box, I plotted the most recent survey and then drew arrows from the previous survey's position to show movement. Three or four survey comparisons are even more dramatic to analyze.

These two-dimensional plots emphasize that short-term gains in station cume may be realized by successfully targeting secondary competitors' audience, while not losing sight of primary competitors. They also help to detect potentially competitive movements by tertiary audience-sharing stations.

William Engel is President of VNU BIS Operations and Exec. VP of Birch/Scarborough Research. He can be reached at (305) 753-6043.

RADIO is more than sound. Radio makes you feel a part of something big and yet incredibly close to the individual voices who deliver it. Only on radio can one person broadcast to thousands of people and make each of them feel like the conversation is just for them. It's that personal.

We believe the business of radio should feel the same way. We are the people of Arbitron. The names and faces behind the data. We're committed to building closer relationships with you, the people of the radio industry.

We're strengthening the depth and quality of your audience data, making our training courses simpler and building new services to turn our wealth of information into even better tools to help you sell. Most importantly, we're listening to what you have to say. Because when it comes to strengthening the business of radio

WE HEAR YOU

ARBITRON

R&R
RADIO & RECORDS

Callout Research: Focus On Details

Birch Scarborough Research

Overall Success Depends On Strong Design, Execution

By Bill Engel

If you're doing callout research, it may be time for a checkup on your success. Are you using the right formula? Good design + faithful execution = conclusive data.

The overall health of your research program is critical to obtaining information that reflects a true cross section of the market. One flaw in your design, a few lapses in execution, and you're making decisions with data that belong in the garbage can instead of decisions that can successfully guide your future.

Let's do a "design check." Use the following topic and corresponding questions to evaluate your present program.

Random Telephone Samples

Start with the source from which you're obtaining your sample – the "sample frame." If you're doing a form of random digit dialing, are all exchanges in your survey area represented? I suggest using the Bell core files so if a new exchange appears on-line, you can sample it within 30 days.

Do a tabulation of responses by zip code. Compare that tab with a zip code distribution of the population from Claritas Inc. to determine whether or not you're getting representative coverage from your sample. If not, you have either a flaw in your frame or a problem with your cooperation rate.

"Good design + faithful execution = conclusive data."

What do your sample's station preferences look like compared to Birch's? If they're drastically different, reexamine your frame as well as your execution. (Callout research will never mirror diary data such as Arbitron's.) Poor sample coverage assures unconclusive data.

"If you're not getting representative coverage from your sample, you have either a flaw in your frame or a problem with your cooperation rate."

Random samples which are ever-changing have the advantages of being projectable to the population and self-correcting over time, as long as your execution remains strong.

Panel Construction

If your sample consists of a panel – the same people surveyed week after week – how is that panel constructed? If it's a panel of your listeners only, you have effectively created a bias which discriminates against a broader point of view.

A couple of hints on panels: make sure you regularly change participants and be sure the participants represent a cross section of your target. If you employ participants who only listen to your station, your ego may be satisfied, but you probably won't advance in the ratings.

For those of you with panels, I suggest creating three subpanels: one consisting of your brand-loyal listeners, one with people who listen to your station on a secondary basis, and one with people who listen within your product genre (format), but not to your station. The weekly or monthly interview with each panel member would target music mix among brand-loyal listeners, appeal among secondary listeners, and competitive advantages among your station's non-listeners.

Panels are projectable to the population only when costly controls are used (such as Nielsen People Meters). Panel samples are more often used as inexpensive tracking devices to measure relative changes within a panel.

Sample Selection

Once you have identified your sample frame, how do you select your sample? If you're doing random digit dialing, is your method of selecting prefixes, or prefixes and block groups, prone to error? If you're generating random numbers, check the randomness of your number generator.

Editing/Key Entry

What are your editing rules? Are they universally accepted, understood, and followed? What percentage of your entries have edit/-key entry mistakes?

Weighting/Processing

Do you weight your data? Has a research professional who understands the potential pitfalls of weighting looked over your procedure? Weighting can often inject more error into the sample than it's meant to correct.

Has your processing system been audited? Has a programmer other than the individual who prepared your system looked over the calculations? You'd be surprised how prevalent processing problems and calculation mistakes are.

Quality Drivers

- Callout hit rate
- Cooperation rate
- Response rate

Tenets Of Research

To gain the most from callout research, make sure you have the following:

- **High response rate** — Response rate is the percentage of eligible people in your sample who actually participated. You should aim for something over 52%.
- **Representative sample frames** — The sample frame must be illustrative of the universe being studied — it's the source of the telephone numbers you select for your sample.
- **Interview control** — Your interviewers must have the tools of success at the ready: great questionnaire, well-thought-out instructions and, above all, training and review. These tools allow them to maintain control of the interview and issue the right instructions to the respondent.
- **Thorough and faithful design execution** — This is critical for providing accurate estimators. No matter how good the design, if you botch the execution, you've just wasted your money. Get the best interviewers you can, train them well, and monitor, monitor, monitor.

Three-Part Execution

The following calculations act as "quality" drivers to help you monitor your execution:

"Random samples which are ever-changing have the advantages of being projectable to the population and self-correcting over time."

• **Hit rate.** What percentage of the numbers being dialed are actually households? Depending on the efficiency of your frame, this number should be between 75-90%. Any higher, and you're probably missing a lot of unlisted households. A lower number indicates your sample is inefficient.

• **Cooperation rate.** What percentage of the households in which the phone is answered is being converted to in-tab? While this is somewhat dependent on the length of your interview, you should look for a cooperation rate of 65% or higher.

• **Response rate.** Response rate is the in-tab divided by the number of qualified units (respondents) in the designated sample. The denominator includes a percentage of no-answers, all refusals, and all early-terminates, etc. The response rate should be 50% or higher. A goal to strive for is above 55%.

Other "quality" drivers, such as age/sex distributions, zip code distributions, levels tracking, ethnicity/nationality proportions, and data ratios (ratios between estimates), will also provide insight into the performance of your sample and staff.

Paying attention to the little details gives you peace of mind and confidence that the data you're collecting is conclusive and can support a decision. Remember, research is like a gun – the slightest mistake can be costly.

RADIO & RECORDS

SHORT-TERM, LONGTERM TARGETING

Brand Switching

By Bill Engel

You know a few things about who listens to your radio station, and why. You know your format is part of a consumer product genre, just as Tide is a detergent.

Within that genre, there are competing brands, each with its own particular set of attributes. These attributes are what set the brand – your station – apart from the competition within your product genre, or format.

Classifying Listeners

Consider this example: a station is programmed with oldies and happens to skew its music toward 1966 (the high school graduation year of a 42-year-old). This particular station falls within the "oldies" product genre, with a "middle-aged" attribute.

You also know there are listeners who spend most of their listening time within your format. In the example of the Oldies station, these listeners, to one degree or another, are either listening to your station, a competing Oldies station, or a combination of both. Chances are high they know you (your station name) and your product attributes (you play oldies that target 1966).

Then there are listeners who spend some of their time within your format; e.g., a primary contemporary listener who listens to Oldies as a secondary format. These listeners may listen to your station some of the time, to competing stations, or to a combination within your format, sampling each.

Finally, there are those listeners who spend no time within your format. They may be primary News/Talk or Country listeners. In any event, your format and station aren't part of their "set" of available format options because your format doesn't appeal to them. More specifically, your format doesn't fulfill any of their needs.

Core Quintiles

At the core of your audience is that segment known as your station's brand-loyal audience. As the name implies, this group makes up the bulk of your average quarter-hour (AQH) audience. Those of you who have studied the theory behind Westinghouse's reach/frequency formula know it's based on the observation that 20% of your cume contributes almost 60% of your AQH.

Extending this examination of cume a little further, the first and second quintiles (five equal groups of listeners), which comprise 40% of your cume audience, contribute more than 80% of your AQH audience. If you break your cume audience into quintiles, beginning with the heaviest listeners, and work down to the lightest listeners, you'll find something very close to the distribution chart at lower left.

The next heaviest group, called secondary listeners, is made up of heavy radio listeners whom you share with other stations, as well as light radio listeners who are brand-loyal to your station. Secondary listeners, those whom you share with other stations, are the ones to focus on and pay particular attention to, since they're the ones you'll target to achieve your short-term audience gains.

The lower three quintiles of cume listeners provide so little AQH audience that they're called tertiary listeners or "occasional" users. These users are targeted for longterm rather than short-term goals, since they spend most of their time listening to another format.

Setting Goals

Now that you know something about who listens to your format, take a look at why they listen. Once you know that, you can set your short-term competitive goals to increase audience, as well as longterm goals to sustain audience; the two goals and targets are different.

When listeners' patterns are observed across your market, you'll see a selection of stations that fit the listeners' moods and needs: the "It's a sunny day so let's pick it up" mood; the "I need a laugh" mood; the "The world is coming to an end and I need to know what's happening" mood; and so on. Within each listener's "station set," there's a "mood label" affixed to each station. We've discovered this mood label is what usually drives format and brand (station) choice.

Knowing how your station is used by people who listen to your secondary format competitors will help you solidify your place within their mindset of stations. Just be consistent with secondary listeners' expectations. If your product definition seems ill-defined to your secondary listeners, as many are, develop a differentiation strategy. Target certain nonformat competitors to build secondary listening.

Targeting Tactics

So . . . how do you target those "secondary listeners?" It's easy.

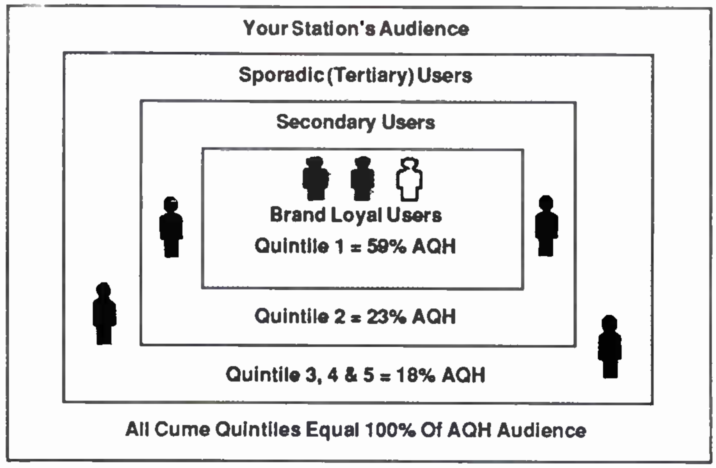
Open up your Birch report to the section that displays two-station duplication (cume duplication). Rank the stations you share audience with, from highest to lowest. Next, do the same for each of your format competitors. After the first two or three stations, usually the biggest cume stations in the market and your direct format competitors, a different pattern will emerge.

You'll see that your station is used differently than your competitors. If your competitor's station is used more by other uptempo-formatted stations, chances are it's being used as a "slow-it-down" diversion for oldies. If your station is used by more "downtempo" format stations, chances are it's being used as a "pick up the pace" format.

If you and your format competitors tend to share audience from the same stations and formats, there's probably very little differentiation between you and your competitor. This situation spells opportunity to the first station to create that differentiation.

In the short run, your competition becomes those secondary format competitors that share audience with you, not your primary format competitor. Increasing your station's share of the secondary audience's total quarter hours will add up to short-term gains in your total AQH and lower audience turnover rates.

Who's Making Up Your Audience



Cume Quintile Contributions To AQH By Listener Type

The graphic depicts a station's audience in terms of its three component parts: Brand Loyals, Secondary Users, and Tertiary or Occasional Users. The percentages shown approximate what the average station can expect as far as quarter-hour contributions by quintile group.

Listening Levels By Quintile

Cume Quintile Group:	Mon-Fri 6am-mid % of your AQH contributed	Mon-Sun 6am-mid % of your AQH contributed
Heaviest Listeners	59%	59%
Next-Heaviest Group	23%	23%
Middle Group	12%	11%
Second-Lightest Group	5%	5%
Lightest Listeners	1%	2%

Note: Distributions are averages based on all stations. Individual station distributions will vary slightly. For example, the heaviest quintile may be as low as 55% for some stations and as high as 63% for others.

Birch Scarborough Research

RADIO & RECORDS

Confessions Of An Arbitron Diarykeeper

BY TOM EVANS

Have you ever spoken to a person who's filled out an Arbitron diary? Chances are you haven't. So here's an opportunity to learn some interesting things about the diarykeeping procedure.

Tom Evans, longtime CHR PD (KIYS/Boise, KPRQ/Salt Lake City, and KRSS/Sioux Falls) and now owner of his own Seattle-based marketing/promotion firm, gained firsthand diarykeeping experience when he and wife Nicole were asked to participate in Arbitron's current fall sweep. Here's Tom's story.

Reality Sets In

What an opportunity! I was one of the few people picked in my area to have the chance to tell radio stations what I listened to as an Arbitron diarykeeper.

During 16 years of radio, including over a decade in CHR programming, I never even inadvertently came across "a friend of a friend" or anyone who had filled out a diary. Now, barely more than six months after hanging up my headphones, Arbitron called me. It was perfect since I wasn't calling on any Seattle area radio at the time, so there was no conflict of interest.

Nicole and I received the diaries two days prior to when the ratings week began. We read the instructions and pocketed the one-dollar gratuity. "I'll fill this out as a very educated listener," I thought. "There shouldn't be any big surprises. Besides, this should be a snap for a veteran programmer." I also promised myself I'd be careful to keep the diary straight, without bias. That promise was about the only assumption that stayed intact as diarykeeping reality set in.

Rick Woodell, PD of 99 WAYS/Macon, GA, reminded me of something I'd heard a while ago: "Diaries are nothing but history books." How true! Trying to deal with my business, the household, my wife, and a two-month-old son, I confess I never made my entries at the time of listening or even [on] the same day. On the contrary. My first entries, reflecting four days of estimated listening, were done on the Sunday of my diary week. Hey, I tried, but I just couldn't get to the book before then.

The Sunday entries were the only ones made during the actual diary week. My other listening was registered eight days after the end of the diary week. Daily diarykeeping gave way to estimated listening.

> **"I entered listening estimates for only about one-third of all the radio I heard. Why? Two-thirds of what I heard came courtesy of the roofing crew working next door."**

Kitchen Table Guessing Game

Maybe things would have been different if I had followed the instructions to "carry my diary with me." I never once took the diary anywhere. The book lay forgotten on the kitchen table every single time I went out. Unfortunately, since most of my listening proved to be "away from home."

Even though I prided myself on a solid memory (with professional insights, no less), I failed to remember the absolute sequence of stations to which I listened over 90% of the time. As for time spent listening to each station, your guess is as good as mine, for that's all I did. I guessed.

It wasn't that I didn't try to follow Arbitron's instructions. I did try to be a good diarykeeper. I took particular note of the definition of listening: "Listening is any time you can hear a radio, whether you choose the station or not." I also took to heart the instructions which read, "Write down all the radio you hear."

Arbitrary Diary?

I heard a lot of radio during my diary week. However, I entered listening estimates for only about one-third of all the radio I heard. Why?

Two-thirds of what I heard came courtesy of the roofing crew working for three days at the townhouse next door. It was a period of beautiful weather and, since I work out of the house, the windows were open. The roofers had their radio up pretty loud, so I unavoidably heard their station for three straight days.

I was tempted to simply list three days of listening to the station, given Arbitron's written instructions. I wasn't absolutely certain, so I called Arbitron's toll-free help line.

I explained the aforementioned facts and my resulting dilemma.

> **"If I had a fair degree of difficulty turning out a quality diary, how on earth can average listeners be expected to do so?"**

The woman at Arbitron paused for a moment, chuckled, and advised, "Don't bother filling it in." I had my answer. But there was more. She continued, "On the other hand, when at work, if the person at the desk next to you has a radio on and you hear it all day, even if it's not your choice, go ahead and put that down."

After thanking her I hung up and thought, "What's the difference? Is this an Arbitron diary or an arbitrary diary?"

As I finished my diary entries and comments, I noted other deficiencies in the book. The timing and separation of daily dayparts seemed a bit confusing. Occasionally, I slipped up and made "Late Afternoon" entries in the "Midday" section. At times there wasn't enough space in a particular daypart for all my listening estimates. Speaking of space, the "opinion" section was pretty skimpy; I ran out of room after just a few comments.

Demand Better Product

Without benefit of followup communications from Arbitron, I finally finished my ratings estimates, added some honest observations in the opinion section, and mailed my diary 12 days after the diary week ended. My wife, whose listening patterns (and concerns) paralleled mine, mailed her diary on the same day.

My diarykeeping experience was marginally interesting from a personal standpoint, but enormously fascinating from a professional point of view. The experience confirmed for me two of the dark suspicions I had during all those years as a PD.

First, if I had a fair degree of difficulty turning out a quality diary, how on earth can average listeners be expected to do so? The answer, in my opinion, is they generally don't, especially if, when filling out their "history book," their sense of history is flawed in any way.

Second, my direct contact with the Arbitron help line provided an arbitrary and capricious ruling. A couple of similar rulings in a given book could mean a difference of a couple of 12+ ratings points. But hey, what's a couple of points among friends? Only a station sale, perhaps a fired PD, a long-contemplated format change, or a whole staff on the street, that's all.

But hey, that's not my problem anymore. It's not Arbitron's problem, either. Radio, it's your problem. It's up to radio to demand an equitable, standardized, easy, and inclusive ratings system from Arbitron (and other ratings services, too). Constantly demand a better product. After all, radio, you're paying the bills. Now I can't wait until I get a phone call from **Birch**!

Birch Scarborough Research

R&R
RADIO & RECORDS

Slogans Steer Success

Don't Miss The First Step On The Brand Loyalty Ladder

By Bill Engel

Most radio programming discussions focus on the formula of the product itself. Little regard is given to the step-by-step process consumers must go through before they're ready to accept that product.

Product name identification is clearly the first step, judging from analysis of the consumer's "buy" process. Radio is one of the most confusing brand name industries in all of consumerdom.

Information Overload

Philip Kotler, the noted marketing educator, developed a behavioral model in the late '60s detailing the steps a consumer takes on the ladder toward brand loyalty. In those days, moving a product from unawareness to awareness just took a little advertising. It's not that way in the '90s. Kotler, or anyone else for that matter, couldn't have imagined the glut of products and services consumers are subjected to today. Your listeners, estimates say, are being bombarded by upwards of 1000 product exposures per day, as opposed to a couple of hundred per day in the '60s.

Media was much simpler then: there was only VHF-TV, AM radio, and a few people experimenting with UHF and something called FM. Disc jockeys were big celebrities with fan clubs, appearances, and followings. There were a few billboards here and there, and product offerings were probably 1/1000 of what they are today. (Some of you might even remember the days when there were only six kinds of bath soap.)

In those days, consumers' preferences, for the most part, were segmented by age, sex, and race. Male 35-44s could be segmented into three or four lifestyle groups. Today that same market and demo might have 10-15 lifestyle groups. Effectively communicating an idea to your target is no longer a simple task. Your message is competing with hundreds of others in an environment where messages range from effective to garbled. You're lucky if your target isn't suffering from scrambled brains by the time you deliver your message. Methods of communicating your message often become least-resistance compromises.

It's not difficult to see how today's environment encourages us to be "fog walkers," filtering and tuning out most unwanted stimuli. The challenge is reaching the fog walkers to start them on their journey up the "brand loyalty ladder" when they don't even know your station's name.

Call letters, slogans, personalities, formats, frequencies – what's the best way to make the confused and bombarded consumer remember your station's name?

Brand News

Moving your station ahead in the ratings requires a thoughtfully conceived product that meets your target's needs. It's not my intention to discuss how to build a winning product or how to move a consumer from brand-aware to brand-loyal. Rather, I'd like to focus on communicating your brand (who that product belongs to) without confusing the marketplace.

According to the **Birch** research department, people identify stations by reporting call letters (about half of the respondents), exact frequency (17%), or slogans (33%). Depending on the market, these approximations can vary. For example, of the five markets examined, Chicago had the highest percentage of call letter mentions (58%) and Jacksonville had the lowest (37%). (We also looked at San Diego, Houston, and New Orleans.)

The problem is that in the early stages of educating consumers about who we are, we often confuse them. If your nickname used to be Andy, your identity becomes confused when your new friends, who know you as Dave, meet your old friends. What does he want to be called? Should I call him Andy? He doesn't look like an Andy . . .

What is an Andy or a Dave? We each have preconceptions of what kinds of people have those names . . . before we even meet them. My mental picture of Andy is of the one who's always throwing rocks. Dave's the tall one with the nice briefcase. How about you? The point is, our perceptions of people, places, and things are formed before we even get to know them.

What's In A Name?

How important is your station's name to the marketplace? After the above example, I shouldn't need pictures to convince you of the importance of your station's name. **Pirate Radio?** To me, that name means, "Wimps need not apply." What about **B-97FM?** That identifier tells me a lot. I know the station can be found around 97FM and the B tells me it's a "hot" contemporary station. I also hear the "B" as "bee." That means I can expect action (buzzing, get it?). In both cases, the name tells me what to expect.

As you move up the brand ladder, remember the old adage: perception is everything. Taking that cue, your first step should be to research how your station's name is perceived. A determination must be made either to deep-six the name or spruce it up through a little repositioning. Be forewarned that a name change may take from six months to two years to become effective. Stations with lots of sampling (big cumes) take less time to get the message across than secondary or tertiary listening stations do.

Once your station's name is in place, be sure to monitor the progress you're making with your target's perception. Your callout research can be your first barometer. The Birch interviews should be monitored as well, to be sure you're making the anticipated progress.

Consistency Is Crucial

Now that you've put your target on track with respect to who you are, it's time to move it from brand awareness to brand knowledge. This step demands that your outside marketing plan be in sync with your internal tactics. Identifying your station's call letters on billboards while using your exact frequency as your on-air identifier won't get the job done. You must be consistent in your presentation of who you are and where you're going.

Sound like basic stuff? Look around your market and count the number of stations that identify themselves in two, three, and four different ways. These stations are dropping the consistency ball hundreds of times each day. Every day our staff sees stations mentioned by two and three different names. Remember to keep that clear mental picture in your target's mind.

The movement from brand knowledge through brand preference to brand loyalty requires a product targeted well to the marketplace; a product which is, to borrow from **Tom Peters**, "of superb quality, presented by committed people, led by enlightened leadership, committed to constant innovation."

Let the record show that no matter how high your product's quality, no matter how good and innovative your people, you won't get to first base without a memorable name. A name that, in itself, sets up a mental picture of who you are. Call letters alone may get you there . . . but it will be a much longer journey than with a great slogan.

Birch Scarborough Research

R&R RADIO & RECORDS

Birch Vs. Arbitron: Response Rate Key To Difference

Even casual observers of Arbitron and Birch estimates can't help but notice the sometimes wide disparity between the services on certain formats. As a rule of thumb, younger-targeted formats do better in Birch, older-targeted formats fare better in Arbitron, and middle-aged-targeted formats are about equal. These patterns have proven consistent across time and markets – but why? Is Birch only talking to kids, and Arbitron only talking to grandparents?

The Importance Of Response Rates

Both Arbitron and Birch achieve demographic in-tab distributions that favorably compare to US Census estimates of demography. Both services also perform admirably when sample distributions are compared geographically on a county-by-county basis. Even zip code sample distributions of both services compare well to Census estimates.

The key difference between the services lies in a statistic that is familiar to very few broadcasters and fully understood by fewer still: response rate. This is defined as the percentage of people in the originally-selected sample who are actually included in the final tabulation.

No research company can be expected to measure successfully the listening of everyone selected in the initial sample; some people may be unavailable or unable to cooperate, and others may refuse cooperation.

Response rate is a gauge as to how "projectable" a survey statistic is to the measured universe. All things being equal, the higher the response rate, the better the estimate. For example, a 60% response rate in a radio ratings study means that usable listening information was recovered from the majority (60%) of the respondents selected for sampling, and it is assumed that the listening of the unmeasured minority is properly represented by the responders. At a 40% response rate, it is assumed that information recovered from the responding minority (40%) is representative of the non-responding majority.

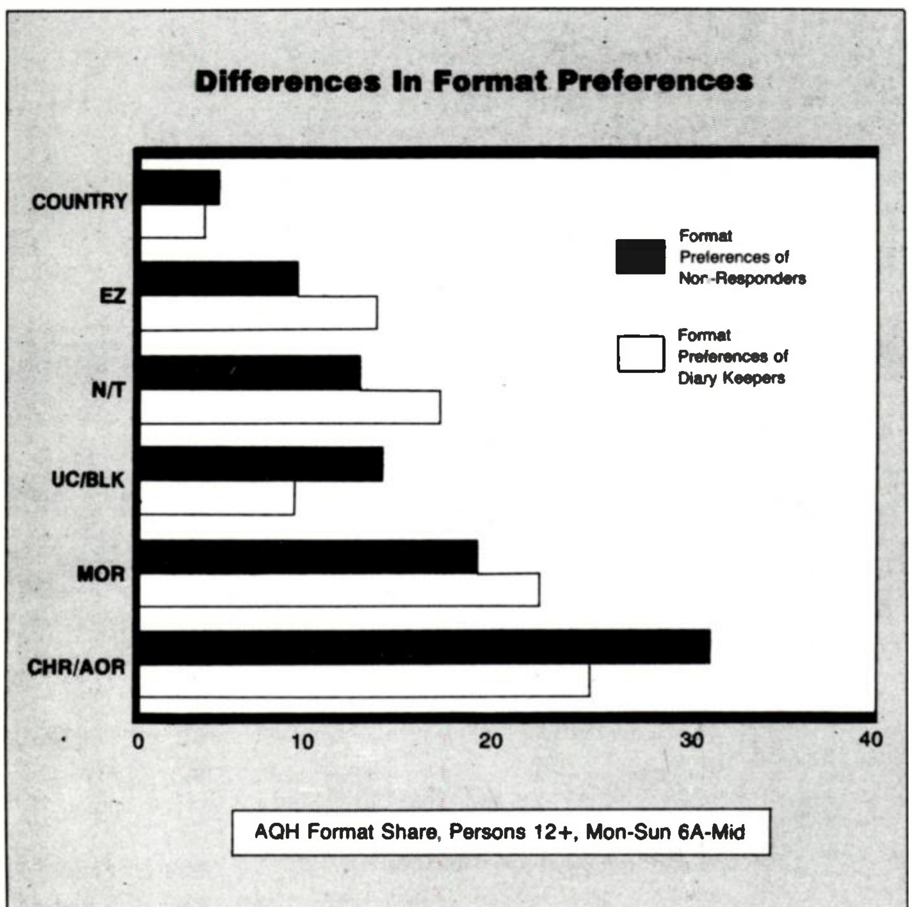
But here's the rub: responders are quite different from non-responders. As response rates drop, so does the projectability of research. In other words, as response rates drop the research becomes increasingly biased against non-responders. Statisticians call this phenomenon "non-response bias."

How Formats Rate

Higher In Birch	Approximately Same In Both	Higher In Arbitron
CHR	AC	Soft AC
AOR	Oldies	Easy Listening
Urban	Country	MOR
Classic Rock	Talk	News
Classic Hits	Black	Classical
"Hot" AC	New Age/Jazz	Spanish
	Religion	Big Band

Non-responders are more likely to be younger (in age and outlook), more active in lifestyle, and from the lowest and highest socio-economic fringes.

Most importantly, responders to radio ratings studies have notably different listening patterns than non-responders.



The Effect Of Non-Response

In 1978 and 1984 Arbitron conducted telephone interviews with diary non-responders to determine the impact of non-response bias on Arbitron estimates. While the 1978 study was published, Arbitron confirmed that the unpublished 1984 study produced similar results.

As can be seen in the "Differences In Format Preferences" chart, the younger-skewing formats are most affected by non-response bias. For example, CHR and AOR together pulled a 31% format share of the listening of diary non-responders, but only a 24.8% share of the listening of diarykeepers. The differences were even more pronounced among Black/Urban listeners: non-response bias accounted for a whopping 54.3% difference between the format share of non-responders (14.2%) and responders (9.2%).

Given the impact on the estimates, all of the syndicated radio ratings companies have been making significant efforts to achieve the highest possible response rates from their respective methodologies. To date, the telephone-based methods utilized by Birch and RADAR (the leading network ratings service) have yielded the highest response rates (see "Unweighted Comparison: Average Response Rates" chart). Arbitron has been working hard to catch up, and has made notable progress in the past two years.

Unweighted Comparison: Average Response Rates

Company	Number Of Markets	Measurement Period	Response Rate
Birch	167	Fall '88	61.6%
RADAR	National	Nov. '87-Oct. '88	60.0%
Arbitron	142	Fall '88	45.3%

Determining Your Report's Response Rates

Response rate information is readily available in the ratings reports. In Birch, the response rate is listed in two places: at the bottom of page one, and again on Methodology Page V (in the back of the book), together with a chart illustrating how Response Rate is calculated. Arbitron provides the ingredients for calculation of the response rate on page 3A (divide total individuals who returned a usable diary (in-tab) by total residences: estimated persons 12+), but does not actually publish the rate itself. To compare Arbitron to Birch, be sure to use the Metro information.

Response rate is considered by statisticians to be a critical determinant of the projectability of survey data, and has proven to be a key factor in explaining the differences in results between Birch and Arbitron.

RESEARCH REVIEW

Issue I, 1991

Bill Engel

Dear Reader:

This issue of Research Review marks a change in direction for our Research communications vehicle. First, most of the input we have received has focused on using less technical speak in our papers. Your interest is on the applicability of our research to Social Research problems and that is the direction we are now heading.

Secondly, Research Review will now be issued quarterly under a schedule which will include most of the small studies and papers that our Operational Group produces during the course of a quarter. We have found more interest in the smaller applications and methods projects than in some of the major methodological work that has been completed. This is largely because the smaller projects seem to have more applicability to your work while they remain ancillary to our mission.

Thirdly, our Corporate Communications Department, which now takes over responsibility for Research Review, informs me that the publication will be more "aesthetically appealing." (I hope that means that they are planning to take my picture off the cover.)

Much input for the future of Research Review has come from our Research Seminar Series held monthly in Sarasota, Fla. The feedback from agency and advertiser representatives at these meetings has convinced us that Research Review fills an important void and that the enhancements will make this publication even more useful.

Finally, requests for additional copies of this issue and back issues continue to come in. Requests for copies or additions to the mailing list should be addressed to Corporate Communications at 1-800-622-4724.

Sincerely,

Bill

Bill Engel
President of VNU BIS Operations,
Executive Vice President of
Birch Scarborough Research

INSIDE . . .

Cumulative Audience: A Report on Modeling Total Audience

by Don L. Goldsmith, Director, Client Research Services

Abstract

In response to requests by the radio industry, Birch Scarborough conducted a study — Seven Day Methods Test or Milwaukee Study — to determine the validity of the Yergin Model and the Birch Cume Model (a derivative of the Yergin Model).

These models estimate weekly cumulative (unduplicated) radio station audience. The results of the Milwaukee Study showed that the cume estimates derived from the Yergin Model and from empirical data tabulations based on multiple-day measurement to be virtually identical. Essentially, the Yergin model appears to be valid regardless of radio measurement methodology (i.e., telephone or diary). Thus, a radio station's cumulative audience is accurately estimated using a statistical model based on the station's average daily cume and average daily duplication. Through a single contact with a respondent, all necessary information is collected, eliminating the need for a multiple-day measurement technique which inherently contains longitudinal, fatigue and other biasing effects.

The Milwaukee study began on random days of the week and continued for seven days. An analysis of time spent listening for the Monday through Friday period shows almost no variation by day. The range from highest to lowest was only 11 minutes.

Introduction

Why does Birch model cumulative audience? Because Birch employs a single contact personal telephone interview with each respondent and it would be impractical to obtain seven full days of radio listening observations in one interview. Why does Birch choose to employ a single-contact-via-telephone data collection procedure? Very simply, such a methodology inherently results in high response rates and less biasing effects. It is well documented in psychological literature that the act of measurement can alter what is being measured (May, Roethlisberger, Dickson et. al., 1927-early 1930s)[1]. With multiple-day measurement, respondents have an opportunity to alter their behavior. Pre-altering or pre-conditioning respondents permits voting behavior over actual listening behavior (Bolton, 1989)[2]. Mathematical statisticians tell us that the additional amount of statistical information obtained through a multiple-day, repeated measurement process is not significant (Frankel & Frankel, 1977)[3].

Is modeling an acceptable approach? Our industry makes billions of dollars worth of decisions based on statistically modeled estimates. The Westinghouse Radio "Reach and Frequency" model and the magazine industry Beta Binomial model (i.e., MRI, SMRB) are cases in point.

The Birch Cume Model was developed by Jim Yergin (who also developed the Westinghouse Radio "Reach and Frequency" model) from two seven-day diary tests conducted in Washington, D.C. and Ft. Lauderdale, Fla. during Winter 1983 (Yergin 1983, 1985). In these studies Yergin found that there was a strong relationship, Monday through Friday, between two-day duplication (the number of average daily cume listeners who duplicate listening with the average previous day) and turnover (Monday to Friday total cume divided by Monday to Friday average daily cume). The Birch Cume Model is based on this strong relationship between two-day duplication and turnover.

For the two-day duplication estimate, Birch directly collects average daily duplication and day-before-yesterday duplication with its Standard Radio questionnaire. The duplication estimate is computed from the Tuesday through Friday listeners (Monday listening is captured with Sunday duplication) and applied against a table of indices for the corresponding turnover. Monday to Friday cumulative audience is the multiplication of the station's average daily cume and the station's turnover.

Has Birch validated its Cume Model? In the past, Birch has validated the cume model using Arbitron mechanical diary observation. However, some industry leaders suggested that validation using a diary technique only validated the model for diary usage. Since Birch employs a personal-interview-via-telephone data collection procedure, it was deemed appropriate to validate the model using the telephone methodology; thus the Seven Day Methods Test was developed. Birch designed the study with input from industry leaders and the Radio Advertising Bureau's GOALS committee.

Method

A two step process of validation was necessary for Monday through Friday radio listenership to determine the validity of the Yergin model and the validity of the Birch implementation. Saturday and Sunday radio listening was empirically collected using independent samples.

The Birch Seven Day Methods Test was conducted in the Milwaukee, Wis. metropolitan area (CMSA) from Jan. 3, 1989 through Apr. 2, 1989. This market was chosen by the Media Research Department of a major advertising agency. The sample was drawn using standard Birch procedures with A.C. Nielsen's Total Telephone Frame (TTF).

The initial interview used the standard Birch questionnaire for the radio listening portion. Then the interview deviated from the standard: the interviewer asked for the respondent's age, sex and race, a callback appointment time for the next day, and a mailing address for the purpose of mailing a monetary incentive ($2). The interviewer in the second interview only collected data for the yesterday radio listening portion of the questionnaire and set up a callback appointment for the next day. Interviews three through six were identical to interview two unless a respondent was unreachable or unavailable one of these days; in such cases, the interviewer asked the respondent for yesterday and full day-before-yesterday radio listening. The interviewer in the seventh interview collected the appropriate radio listening data and asked the education and income questions. If a six-full-day respondent was unavailable for the seventh interview, then the interviewer called him/her the next day and asked for full day-before-yesterday radio listening as well as the education and income questions.

The research design ensured that in the initial interview the respondent was not informed of the monetary incentive until after the radio listening and demographic questions were completed. The incentive was incorporated to maintain a high response rate without influencing the first interview. The research design permitted a maximum recall of two and one half days. If a respondent was not reached two days in a row, he/she was eliminated from the remainder of the study. Each telephone number was dialed as many as eight times an evening after the initial interview was conducted.

All other standard Birch procedures were used (i.e., monitoring, editing, etc.).

Findings

The sample size and response rate for full seven-day responders was 1,235 and 55.9 percent, respectively. The initial interview was conducted with 1,630 respondents with a response rate of 73.7 percent.

The Birch Research Department is presently analyzing the longitudinal effects from the Seven Day Methods Test data. Until this is available, the discussion of findings will apply solely to the validation of the Yergin model. The study found the Yergin model to be valid, producing one week cumulative audience estimates which were virtually identical to those generated from all five days of weekday observations. In other words, Monday through Friday average daily cume and average daily duplication were calculated from the five days of weekday observations. These data were used in the Yergin Model to develop Monday through Friday cumulative audience estimates. (See Table 1.)

TABLE 1

Seven Day Methods Test 1989
Milwaukee, Wisconsin

Top Ten Stations
Monday-Friday, 6AM-12Midnight
Persons 12+

Station	Mon-Fri Observed	Mon-Fri Yergin Model	%Diff Observed
WKTI-FM	3446	3336	-3.2%
WTMJ-AM	2647	2654	0.3%
WLZR-FM	2243	2183	-2.7%
WLUM-FM	2219	2153	-3.0%
WKLH-FM	2151	2005	-6.8%
WQFM-FM	1742	1814	4.1%
WEZW-FM	1573	1525	-3.1%
WMIL-FM	1512	1465	-3.1%
WOKY-AM	1354	1358	0.3%
WMYX-FM	1230	1310	6.5%

Pearson Correlation 0.995*

* Significant at .001 level.

The Yergin model yielded an extremely accurate estimate of cume levels with a Pearson Correlation of 0.995. The mean difference between the observed Monday to Friday cumulative audience estimates and estimates derived from the Yergin Model varied from 0.3 percent to 6.8 percent — well within the range of standard error.

Since the first day of interviewing was not the same for each respondent, a significant outcome of this test is data showing the amount of radio listening per day. This analysis showed that Monday through Friday time spent listening (number of quarter hours) is almost flat, only differing in magnitude from highest to lowest by 11 minutes. The data showed Friday and Tuesday with the most listening, then Wednesday and Thursday with virtually identical listening, and Monday with the least amount of listening. Self-administered longitudinal studies tend to show variations in listening by day which in part are due to respondent fatigue. Weekend listening was at a lower level than weekday, with Saturday levels higher than Sunday levels. The average listener reported over 95 quarter hours of listening per week or 3 hours and 25 minutes per day. (See Table 2.)

TABLE 2

Seven Day Methods Test 1989
Milwaukee, Wisconsin

Day of Week	# Quarter Hours
Monday	14.06
Tuesday	14.74
Wednesday	14.44
Thursday	14.45
Friday	14.82
Saturday	12.86
Sunday	10.42

Conclusion

This study validated the Yergin Model and confirmed that a radio station's Monday to Friday audience is accurately estimated using average daily cume and average daily duplication. Since modeling works in radio audience measurement, a seven-day measurement technique, which is more intrusive and contains a fatigue factor, is unnecessary. ☎

[1]*The Hawthorne studies, performed at the Western Electric Company, were a pioneering series of experiments started in 1927 and continuing into the early 1930s. E. May, F.J. Roethlisberger and W.J. Dickson, among others, were involved in the studies.*

[2]*Bolton Research Corporation. A User's Guide For Bolton Research Corporation's Diarykeepers Exposed!: Explanations and Conclusions, Programming and Marketing Strategies. 1989.*

[3]*Frankel, M.R. and Frankel, L.R. "Some Recent Developments: in Sample Survey Design." Journal of Marketing Research, 14 (August 1977), 280-93.*

Sample Balancing . . . .

by William E. Engel

Sample balancing is the process of determining weights for sample data such that the resultant weights will be consistent with specific marginal distributions.

For example, if the marginal distributions for age and sex in a given population are known, then we may require that appropriate weights be applied to the sample age and sex estimates to make them agree with these marginals. Sample balancing is therefore a procedure used for incorporating information that is external to the sample into the estimation process (the process that is used to project the sample results to the universe or population.) Typically, sample balancing is used to combine demographic data such as age, sex, geographic location, etc., with sample data.

Sample balancing is a post-stratification procedure that if properly implemented, reduces the estimation error. This reduction in error has two aspects. One reduces the effect of random error on the estimate, and the other reduces biasing effects. Through imputation or ascription, biasing effects which may have crept into the sample during data collection can be reduced. To what degree and to what end is the issue. Non-response, for example, can be a significant source of bias. Sample balancing may reduce the effect of the non-response bias somewhat, but much of it can be expected to remain even after the most discriminating sample balancing procedure. Why? Because the values being imputed to the non-responding part of the population can only come from the responding part of the population.

The problem is illustrated by the following extreme and artificial example. If all male respondents in a survey were unemployed, and all male non-respondents were employed, then sample balancing would adjust the sex ratio but would still leave a severe bias in that all males in the sample would continue to be unemployed.

The appeal of weighting is hard to resist. The ability to balance or match a sample to many population characteristics is addictive. The appetite for more and finer stratification often seems insatiable.

While the use of sample balancing is a truly elegant solution to the challenge of projecting sample results to population parameters, the process is fraught with landmines. If one explodes, the effect may blow the variance of the sample estimates and hence their total estimation error, leaving the user worse off than without sample balancing at all.

When is the Cure Worse than the Affliction?

It should be noted that the goal of the weighting procedure is to achieve a reduction in the total error of estimation. The mean squared error of an estimate is one way of measuring the total error. It is the square of the difference between the estimate and the true value of the population parameter being estimated. It turns out that it is also equal to the sum of the variance of the estimate and the squared bias, i.e.,

mean squared error = variance + bias squared

Again, the variance is a measure of the effect of the error due to the use of a random sample. Such errors are as likely to be negative as positive. In fact, over the long haul the average of these errors will be zero.

Bias on the other hand, is an estimation error which tends to persist in a particular direction, either positive or negative, and over the long haul, will average to a non-zero value.

"Land-mines" come in two forms. The obvious one is that caused by incorrect sample-balancing weights. Less obvious but equally troublesome is the use of cells with small sample size in the sample balancing process. The problem occurs because as the cell sample sizes decrease to small numbers, the variance of the "balanced" estimate actually increases above that of the unbalanced estimate. When this increase in variance exceeds the reduction in the bias squared term, an increase in the total error occurs.

The decrease in the cell sample size is related to the number of cells used in the sample balancing scheme. It is not uncommon to request a sample balance to guarantee the sample will match six marginals such as:

1. Twelve age/sex groups (Basic Demos)
2. Black, Spanish, Other (Race Nationality)
3. Ten Counties (Geographic Post-Stratification)
4. Three Product Usage Groups
5. Male/Female Main Wage Earner
6. Four Education Categories

This produces:

$$12 \times 3 \times 10 \times 3 \times 2 \times 4 = 8{,}640$$

There are now 8, 640 cells in the sample balance scheme.

One can quickly see that if we have 1500 in-tab in a market and over 8000 cells to balance, we have a SIGNIFICANT problem. As the variance term shoots up, it surpasses the error we were trying to correct in the first place. In this case, the cure is worse than the affliction.

What is the ramification? Look Before You Leap! Always remember not to over-drive the sample. Keep the number of cells within reasonable bounds. Ask yourself a simple question: "Does the addition of target weighting marginals improve the estimate or weaken it?" Ask yourself if the cure is worse than the affliction. ☎

Research Review is published quarterly by the Research Department of Birch Scarborough Research Corp., 12350 N.W. 39th Street, Coral Springs, Florida 33065, (305) 753-6043. Subscriptions are free. Reliable sources are consulted for information and every attempt is made to preserve the integrity and accuracy of such information, but no guarantee is made.

Answering the Answering Machine Issue in Telephone-Based Survey Research: How to Keep Response Rates Up

by Greg Johnson, Research Analyst, and Ed Cohen, Ph.D., Director of Research

Abstract

The presence of answering machines in residences has increased tremendously during the past few years. As this phenomenon continues to proliferate, the ability of telephone-based survey researchers to reach potential respondents could become increasingly difficult. The difficulty is not due to the machines themselves, but to the way in which they are used -- as a means to screen calls, for example.

Birch Scarborough conducted a study to determine the best way to overcome the answering machine obstacle. The study was conducted in ten geographically dispersed markets where we found that a total of 5% of the numbers called were answered by a machine. Two techniques were used in this study to determine their effectiveness in obtaining responses from an answering machine. They were: 1) leaving an alert message 2) leaving an additional alert message along with a request for the potential respondent to call an 800 number.

Generally, the study found that response among persons using an answering machine could be increased using either or both of these techniques. However, it appears that in some tested markets, as market size increased, the effectiveness of using either of the above techniques decreased.

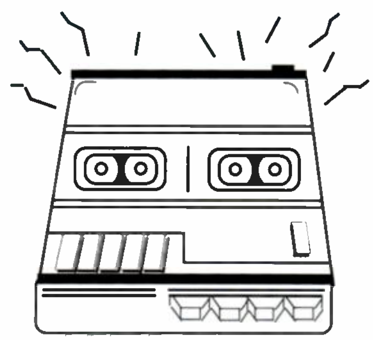
Birch Scarborough recognizes the importance of continually monitoring and evaluating answering machine usage in an effort to keep response rates as high as possible.

Introduction

The increase in the use of answering machines has made it more difficult for telephone-based survey researchers to reach a segment of the population for inclusion in its sample. Among these answering machine owners, the result is often a lower response rate. Because a survey's response rate is a strong determinant of how well the survey represents the population under study, it is very important to achieve as high a response rate as possible. In an effort to convert as many households with answering machines from non-contacted sample points to completed interviews, two different strategies for dealing with answering machines were devised, implemented, and analyzed. These two strategies were applied to a Birch Scarborough media survey collecting radio listening, demographic, and product data in ten markets across the United States.

Method

Field work for the test was conducted during February, March, and September of 1989. The sample used was a



standard random digit dial sample (Nielsen's Total Telephone Frame (TTF)). The markets included in the study were as follows:

Augusta	Boston	Buffalo	Chicago
Los Angeles	Memphis	New Orleans	New York
Salt Lake City	San Francisco		

During the month of February, interviewers were instructed to record "AM" on call record sheets whenever they encountered an answering maching if the recording on that machine made it clear that the phone number reached was a household. This allowed for an analysis of response rates and incidence of phone numbers which yielded any residential answering machine recording. No special treatment for answering machines was employed during this first month.

During March, interviewers were again instructed to use the code "AM" when an answering machine was encountered. In addition, the interviewers were instructed to leave the following message on the machine:

> "Hello, this is _______________ calling from Birch Radio Ratings. We are conducting a short survey of radio listening in your area. We're sorry we missed you because your radio listening habits are extremely important to our survey. We will be calling again in the next couple of days. Thank you very much."

Every time an answering machine was encountered during March, the above message was left. All other calling procedures used during March were the same as those used in February.

During September, a slightly different approach was taken. The first time an answering machine was encountered at a household, a message identical to that used during March was left. If an answering machine was encountered a second time while dialing this household, the following additional message was left:

"Hello, this is ______________. I'm a supervisor calling for Birch Radio Ratings. We have been trying to reach your household and need your help with a short survey of radio listening in your area. Your radio listening habits are extremely important to our survey. Please call us at our toll free number, 1-800-622-4724 and ask for Terry Stewart. By calling us, we can get a better picture of what, if anything, people like yourself enjoy on radio. Thank you."

The addition of this message was an effort to help convey the legitimacy of our company as a research firm and to differentiate us from telemarketers and solicitors. The use of an 800 number also allowed respondents to contact us at their leisure. If a respondent called in after receiving the second message, he or she was transferred to a trained interviewer who would conduct the interview using our standard questionnaire.

Findings

The results of these strategies are summarized in Table 1.

TABLE 1

Percentage of Answering Machines Resulting in Completed Interviews by Market and Month

Market	February (no message)	March (first message)	September (March message plus new message including 800 number)
Augusta	28.6%	30.2%	41.8%
Boston	45.5	44.7	53.1
Buffalo	23.0	23.0	39.5
Chicago	46.4	47.0	51.6
Los Angeles	32.2	32.8	31.8
Memphis	26.8	40.0	35.4
New Orleans	16.7	31.0	29.6
New York	39.4	42.2	40.9
Salt Lake City	18.5	20.0	42.9
San Francisco	39.8	38.0	38.5
Total	35.7	38.0	41.4

During February, when no messages were left on any answering machine, an average of 35.7% of those numbers called which were answered by a machine resulted in a completed interview. When the first message was left on the machine in March, the percentage of completed interviews increased to an average of 38.0%. During September, when the March message plus an additional message including a toll free 800 number were left, the cooperation rate increased to an average of 41.4%.

It appears that virtually across the board, leaving a message increases the cooperation rate of households with answering machines. The exception is San Francisco. In some markets, one message worked better than two. In others, two worked better than one. There was an inverse relationship (although the calculated correlation is not statistically significant) between market population and the strategies investigated. Generally, as market size increases, the effectiveness of leaving either of the above messages decreases.

During September, we found that only 5.4% of the numbers dialed were answered by a machine when a Birch interviewer called (see Table 2).

TABLE 2

Answering Machine Incidence

Market	Numbers Dialed	Total Answering Machine Incidence
Augusta	1600	4.2%
Boston	3091	7.8
Buffalo	1797	4.5
Chicago	3767	5.5
Los Angeles	6833	3.4
Memphis	1665	4.7
New Orleans	2126	5.4
New York	5269	6.7
Salt Lake City	2694	8.5
San Francisco	1622	3.3
Total	30464	5.4

Although answering machines are in wide distribution, the Birch Scarborough Study did not show very high use.

Conclusion

Within most markets completion rates can be improved, in some cases dramatically, for households using answering machines by leaving a message. Since 1989, Birch has been effectively dealing with the answering machine issue in this manner.

As the use of answering machines continues to grow, Birch Scarborough will continue to research and evaluate new ways of dealing with this phenomenon in an effort to keep response rates up. ☎

Trends . . .

When FM was introduced as a viable mass medium in the mid 70's, little did we know that this revolution would dictate the future of media. Since the emergence of FM, the industry has watched the number of stations competing for market share grow enormously.

Just as strategies were being developed to maximize reach and frequency, along comes FM bringing with it a third dimension on which to plan -- segmentation. Never again could one station be all things to all people.

With these variables to consider, the question becomes, "Which variable or what combination of variables should be the goal?" Each variable can be achieved relatively easily by buying the right combination of stations. For instance, greater segmentation has meant more cross station duplication as listeners continue to listen, on average, to more than two stations per week. With a group of relatively similar stations, the advantages of frequency increase. On the other hand, clusters of a few dissimilar stations will have the ability to achieve a greater reach. The strategy of balancing clusters of duplicators with clusters of dissimilar stations can achieve the impact of a solid frequency schedule combined with an acceptable target-market reach.

As mentioned in the last issue of *Research Review*, traditional age/sex demographics no longer provide the basis for programming and advertising planning and buying. The shift from quantitative descriptors to "qualitative" information has been brought on by the segmentation of radio. Radio's strategic planners can now use sophisticated microcomputer systems to evaluate multi-dimensional radio strategies and tactics, test reach/frequency hypotheses, and create buys that use both qualitative and quantitative data.

Not only is "qualitative" an integral part in radio planning, but the same data can now be used for strategic planning in television, newspapers, and certain national magazines. With radio having set the stage for identifying and targeting segmented markets, the time has come for each other medium, individually and collectively, to apply those same strategies.

The days of traditional demographics have given way to a more complex period of multi-media qualitative data, allowing for a more defined target delivery. Because of this, strategies in the media industry will no longer be based on the idea of "mass" media, but instead on a new vision more properly termed "micro" media. ☎

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