

HOW SCARBOROUGH RESEARCH CORPORATION MEASURES NEWSPAPER AUDIENCES: AN HISTORICAL REVIEW

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Synopsis

Perhaps the single most important contribution to the marketing of newspapers was the development of the concept of audience coverage, or personal consumer "reach" expressed as people exposed to a publication. Scarborough Research Corporation and its sister company, Belden Associates, both use traditional "yesterday" readership measurements to define the average weekday audience of a newspaper. "Last Saturday" and "Last Sunday" reading questions measure weekend audience on an average issue basis. All questions used to measure newspaper exposure follow the guidelines of the U.S. Advertising Research Foundation and the Newspaper Research Council.

The role of a recommended "past 7 days" reading screen-in question, which has been standard in North American newspaper audience research for more than thirty years, calls for re-examination. The national Canadian measurement of newspaper audiences, NADbank, eliminated the "past 7 days" filter in 1988 with no ill effects. Belden Associates, in partnership with Quadrant Research Services Pty. Ltd., has successfully conducted a number of audience studies for regional daily newspapers in Australia (by telephone) without the screen. As response rates in telephone surveys become more challenging in the 1990s, Scarborough plans to conduct empirical research to test the usefulness of the filter and potential effects in the U.S. by doing away with it in future years.

Scarborough and Belden both endorse the "yesterday" reading criterion as the standard for defining average weekday audience. We have found this technique to produce results that correlate most favorably with relative circulation patterns and relationships between subscriptions and casual purchases. Interviews are conducted on Tuesdays, Wednesdays, Thursdays, Fridays and Saturdays to yield an average weekday (Monday to Friday) measurement.

Consistently, newspaper audience studies using the "two-interview" method produce cumulative audiences which are significantly higher than those based on data gathered in one interview. Scarborough, working with Daniel Mallett Associates, has initiated a program of research to develop a model for creating cumulative audiences with a single interview that approximate cumulative levels expected with two observations. The encouraging first results of this work in progress are presented in this paper, with an example of how the new model is applied in the calculation of a five-day (weekday) cumefor a daily newspaper.

A. The Origins of Newspaper Audience Measurements in North America

Perhaps the single most important research contribution to the marketing of newspapers many decades ago was the introduction of the concept of audience coverage, or "reach" expressed as actual readers. This development released

newspapers from the rigid confines of circulation counts, which told advertisers nothing at all about the types of people exposed to the newspaper.

Newspaper audience measurements gave both advertising sales and editorial departments a new dimension encompassing demographic characteristics, shopping patterns, product purchases, use of services, and a variety of lifestyles information which was found to be useful to multiple departments of the newspaper.

The origins of newspaper audience research in North America are found in the early work done by George Gallup Sr. in the 1930s; Alfred Politz, Bill Simmons, Carl Nelson, Joe Belden, and others in the 1940s and 1950s; the Audits & Surveys research firm in the 1960s; and Harold Israel, who founded Scarborough Research with Jay Cohen in the 1970s and 1980s. There are many other researchers who contributed concepts along the way. But these individuals and firms were guiding lights in the evolution of newspaper audience measurements.

Since 1989, Scarborough Research Corporation has conducted all newspaper measurements by telephone interviewing. Our companion company, Belden Associates -- which functions as the custom research arm of Scarborough -- also converted entirely to telephone samples in the early 1980s. Both firms follow explicitly the guidelines recommended by the Newspaper Audience Research Council of the U.S. Advertising Research Foundation.

These guidelines have been translated by Scarborough into the following standard questions:

1. Sunday Newspapers:

- a. First I'd like to ask you about Sunday newspapers. During the past 4 weeks, which of the following Sunday newspapers, if any, have you read or looked into, either at home or away from home? Have you read or looked into any part of the Sunday (READ FIRST SUNDAY NEWSPAPER) in the past 4 weeks? (READ REMAINDER OF LIST.)
- b. Have you read or looked into any part of any other Sunday newspapers in the past 4 weeks? (WRITE IN NAME & CITY/TOWN ON ANSWER SHEET.)
- c. (FOR EACH PAPER MARKED "YES" OR "NOT SURE", ASK:) When was the last time you read or looked into an part of the Sunday (NAME OF PAPER)?

2. Weekday Newspapers:

- a. Now I'd like to ask you about Weekday newspapers published every day Monday through Friday. During the past 7 days, which of the following newspapers, if any, have you read or looked into, either at home or away from home? Have you read or looked into any part of the (READ FIRST NEWSPAPER FROM LIST) in the past 7 days? (READ REMAINDER OF LIST.) (IF "NO" READERSHIP, GO TO PROBE.)
- b. Have you read or looked into an part of any other weekday newspapers in the past 7 days? (WRITE IN NAME & CITY/TOWN ON ANSWER SHEET.)
- c. (FOR EACH PAPER MARKED "YES" OR "NOT SURE", ASK:) It is important for us to know when the newspapers were read. When was the last time you read or looked into a copy of the weekday (NAME OF NEWSPAPER)?
- d. (IF "TODAY", ASK:) When was the last time before today that you looked into a copy of (NAME OF NEWSPAPER)?

In Scarborough's annual surveys of the top 50 U.S. markets, we use a two-interview technique in 16 markets, averaging the results of both observations to obtain average weekday (Monday to Friday), average Saturday, and average Sunday exposure. In the remaining markets, all newspaper audience data is gathered in a single interview.

The "read yesterday" standard is used to define weekday audiences. For weekend readership, the standards are: "read last Saturday's paper" and "read last Sunday's paper (since last Saturday)." Aided recall is utilized, inquiring about each prelisted newspaper, for all papers with 5 percent penetration or higher in the market surveyed. Smaller, non-listed newspapers are measured when respondents are probed for "any other" weekday or weekend newspapers read.

Two other technical details: our universe is defined as all adult consumers age 18 or older residing in telephone households. Selection of the respondent, one to a household, is achieved using the "last birthday" technique.

B. The Role of Screen-In Filters for "Yesterday" Exposure Measurement

Prior to the mid-1970s, the standard filtering process prescribed by the U.S. Advertising Research Foundation included the following steps:

1. "Ever read" the newspaper?
2. Read a weekday copy during the past seven days?
3. When (before today) was the last time the paper was read?

Around 1975, Belden Associates successfully lobbied in favor of dropping the "ever read" filter. There was no perceptible effect on levels of readership measured after this change.

However, the "past seven days" filter question took on a life of its own. At one recent stage in its evolution, the wording was so cumbersome that it required approximately 30 seconds to read on the phone. It even included a prompt to the respondent to "please name any newspapers you **may** have looked at, but are **not sure about**." Thankfully, this screener is now more succinct and far more "user friendly" for interviewers. The newer version was tested rigorously in research conducted independently by Simmons Market Research Bureau and Market Opinion Research and analyzed by the U.S. Newspaper Research Council, prior to implementation.

In a recent analysis of reader attrition between the 7-day screener and the "yesterday" measurement of 68 separate weekday audiences, we found the following pattern (expressed as indices, with "percent reading in past 7 days" carrying a value of 1.00):

Average Weekday Audience:

High -	0.84
Low -	0.63
Average -	0.76
Read in Past 7 Days -	1.00

The main finding is that approximately one out of four readers identified in the screener falls by the wayside when the more rigorous "yesterday" reading test is administered. It should be noted that Scarborough has a standard practice of asking the "yesterday" question to anyone who says they "aren't sure whether they read in the past 7 days." Only those who say absolutely that they have **not** read in the "past 7 days" are screened out.

In recent years, Scarborough and Belden have not used extended screeners such as "read in past 6 months" or "past 4 months." Nor have we ever suggested to the U.S. newspaper industry that the 7-day screener be dropped or expanded to a longer period. We have preferred to follow the guidelines of the ARF and the Newspaper Research Council to the letter.

Scarborough fully intends to pursue investigations of the role of the 7-day screener in the future. In Canada, the national readership survey sponsored by the newspaper industry called "NADbank" abolished all screeners entirely in 1988, going directly to a "yesterday reading" question.

As a technical consultant on that project, I saw no ill effects from dropping the 7-day screener. Pretesting indicated that we would achieve a significantly higher response rate to the telephone interview portion of the study by eliminating the screens. As a result, I implemented this same approach in a series of regional newspaper audience studies in Australia during 1989-1990 conducted in partnership with Quadrant Research Services Pty. Ltd.

As response rates become a greater challenge to telephone interviewing in North America, Scarborough plans to sponsor new research during the next several years to test the effects of dropping the 7-day screener in our U.S. work. The recently formed Newspaper Association of America has appointed an advisory committee on syndicated research which provides a forum for evaluating this research. Every additional second that we burden a respondent during the interview can drive down the response rate, as well as interviewer morale. If we can reduce interview length without harming the average issue measurement for newspapers, all the better.

C. The "Yesterday" Approach to Measuring Average Weekday Exposure

Throughout all newspaper audience research conducted by Scarborough and Belden spanning the past twenty-five years, we have found the "yesterday" reading technique as the standard for defining weekday audiences to be the most precise, for a variety of reasons.

Please keep in mind that all our samples are conducted during Tuesdays, Wednesdays, Thursdays, Fridays and Saturdays, with approximately equal numbers of interviews gathered for each day. The "yesterday" measurement produces an estimate of "average weekday exposure." (In Australia, we have also included an expansion, gathering **separate** audiences for **each weekday**, Monday to Friday.) No interviewing is conducted on Sundays or Mondays.

The average weekday measurement in Scarborough and Belden studies correlates closely with relative circulation relationships in most instances. Relative differences between readership and circulation are usually explained by differential readers-per-copy estimates. In newspaper research, we are spared the wide range in readers-per-copy that are commonly found in magazine audience research worldwide. Newspaper adult readers-per-copy for most markets fall within a fairly tight range between 2.2 and 2.8; in some larger markets, the RPC estimate exceeds 3.0, but these are rare cases.

In presenting the latest audience results to newspaper clients, we always stress that the "average weekday" estimates apply the most rigorous test possible, and therefore are the most conservative estimates that can be gathered for a daily newspaper. We then explain that this technique is the only method that will produce audience estimates that can be equated with precision to average daily circulation in the aggregate as well as patterns of subscribing versus casual purchase.

Belden Associates has repeatedly tested a "recent reading" technique based on the number of weekdays read during the past 7 days, calculating an "average weekday audience" from the normal "probability of reading" (actuarial) approach. The discovery from these tests is that memory decay causes an understatement in the average weekday estimate which can only be corrected by a "yesterday" measurement.

This memory decay typically causes a deflation in the weekday audience of 1 - 4 percentage points based on Belden's experience with hundreds of readership surveys over a twenty-year period. The cumulative audience of a newspaper, discussed in more detail in the next section of this paper, is normally calculated by Belden based on the frequency of reading over five weekday issues. However, the starting point, or C(1) value comes from actual "yesterday" estimates rather than a derived average audience based on the respondent's frequency distribution over 5 days. This use of the "yesterday" estimate to start a newspaper's cumulative audience estimate is called the Belden Correction Factor for Memory Decay. Scarborough uses the same approach: any cumulative audience projection will start with an average issue estimate based on the "yesterday" readership results.

All of the basic principles described for weekday audiences also apply to Saturday and Sunday estimates. The only difference is that all respondents interviewed each week (Tuesday - Saturday) are asked about reading "last Saturday's" and "last Sunday's" paper.

In the sake of time, I have focused on weekday audience results for this symposium.

D. Newspaper Cumulative Audience Estimates

There is virtually no controversy in North America about the proper way to measure average issue audiences. Other than minor refinements to the 7-day screener, and its elimination entirely in the Canadian NAD bank studies, the "yesterday" reading standard has been the rule for more than 30 years.

We find more diversity in estimation techniques when we turn to **newspaper cumulative audiences**.

Currently there are two designs used in the U.S. to estimate "turnover" of readership and to derive cumulative audience measurements for newspapers. Because it is these turnover rates which provide the starting point for estimates of audience accumulation, they warrant careful evaluation.

One technique requires a second interview with the respondent; the other technique generates reach and frequency projections from one observation, or from multiple observations taken in the same interview.

Just as the modified "past 7 days" screener reduces interviewer and respondent time on the phone, and thus costs, so does the one-interview design for estimating cumulative audiences. If it could be shown that this method produces adequate estimates of cumulative audiences, then it would appear to be the methodology of choice.

What does the evidence indicate?

A seminal study in the early 1980s by Mark Mattison, Marketing Manager of then-Knight Ridder Newspaper Sales, showed significant differences between the cumulative audience levels produced by the two-interview approach and that using a one-interview design. The two techniques were applied to the same respondents.

First, the respondent was asked to recall the individual days of the past week and his/her reading of a specific newspaper on each weekday. The accumulating audience percentages were added to the average issue audience derived from the separate "read yesterday" question to develop a five-issue cume measurement. Each respondent was then recontacted several weeks later to gather another "read yesterday" observation at a second point in time.

By use of the Beta Binomial procedure, a five-day cume measure was estimated from the two "read yesterday" observations. Mattison reported that the "two-interview method capturing 'yesterday reading' at two points in time developed a higher turnover rate from one issue to two issues, and substantially higher cumulative audiences":

	One-Interview (Actuarial) Approach	Two-Interview (Beta Binomial)
Average Issue	38.4%	40.6%*
5-Issue Cume	45.1%	62.3%
Growth Index	117	153

*Calculated by averaging "yesterday" readership for the two observations.

Mattison and others have hypothesized a "yea-saying" artifact when readers are asked to tell the interviewer on which days they read the newspaper. This in turn reduces turnover and increases frequency, all caused by the one-interview technique itself. The other side of the coin is "nea-saying" which is said to produce the same effect: a flattening of the reading distribution curve over the five weekdays. The theory is that people tend to respond in ways that make them look consistent. It is easier to say that one reads every day, even if they missed a day for some compelling reason. Conversely, memory decay or plain laziness may keep someone from reporting that chance encounter with their local newspaper at a restaurant or the dentist's office last week. Both "yea-saying" and "nea-saying" contribute to lower turnover rates, and thus, to lower cumulative audiences for newspapers.

In 1986, the U.S. Newspaper Research Council addressed the issue of the one versus the two-interview design. The committee chairman, Dr. Jeremy Sprague, stated the following: "As research costs escalate, the Newspaper Research Council has decided to address the feasibility of using a single-interview methodology to develop the necessary data. The money saved could be used to increase sample sizes, improve recovery rates, or otherwise improve the quality of the data."

In the NRC study, five newspapers were analyzed in markets where both one-interview and two-interview studies had been conducted at about the same time period. In every instance the two-interview design produced significantly higher two-issue cumes. Correspondingly, it was found that turnover rates for the five papers were also higher in the two-interview design where turnover is defined as the ration between the two-issue cume and the average issue audience. Essentially this study confirmed Mattison's findings.

In 1988, Tom Copeland, then head of research for Copley Newspapers, and John Mennenga from Sawyer-Ferguson-Walker Newspaper Representatives, reported to the Newspaper Research Council on another test of the one-interview versus two-interview design. The study was conducted by the Research Department of the San Diego Union-Tribune, with these components:

1. After a "read yesterday" question, the respondent was asked about reading the Tribune on the weekday before last. This question provided the second observation needed to drive a Beta function.
2. A second interview was then conducted from one to three weeks later on a different day of the week, asking "yesterday reading" again.

Cumulative audiences, each applying the Beta Binomial, were calculated from the one-interview and two-interview data. These were the results:

	One-Interview (Beta)	Two-Interview (Beta)
Average Issue	56.9%	56.1%
Five-Issue Cume	69.0%	74.0%
Growth Index	121	132

The differences in this test were less than those found by Mattison and Sprague. What might account for this?

First, in the Copeland/Mennenga study, the one-interview data was based on only two days of reading: "yesterday" and "the weekday before yesterday."

In the earlier studies, cumulative audiences derived from one-interview data were estimated by the actuarial matrix based on the number of days out of the past five in which reading was recalled.

To the extent to which these two tests, Mattison's and Sprague's, depend on more distant recall -- all five weekdays, rather than just two -- they are prone to both the effects of memory decay and "yea-saying" to a greater extent than the test reported by Copeland and Mennenga. Also, in the latter test, the use of the Beta Binomial algorithm for both the one and two-interview estimates appears to have created a closer match than that found by Mattison or Sprague, who used different algorithms for their comparisons ("actuarial" for the one-interview data and Beta Binomial for the two-interview data).

As mentioned earlier in this paper, Scarborough currently measures newspaper audiences with a two-interview design in 16 markets, mostly the largest ones, and with a one-interview design in the remaining 40 markets that we survey each year. We also find that our estimates of newspaper cumulative audience are higher when the two-interview design is used. However, it is cost-prohibitive for us to instate the two-interview approach in all 56 markets.

A sidenote: when you conduct 150,000 telephone interviews per year, as we do, such decisions are weighed rather carefully.

For several years, Scarborough has been exploring alternatives to the two-interview technique that would preserve the turnover rates and cumulative audience levels attained by the two-interview design. Although costs are an important consideration in eliminating the second observation, other factors that encourage it are the savings in time required to process a study, and a steady drop in recovery rates for the second interview (down from 80%+ during the 1980s to less than 80% today).

In late 1992, we commissioned Daniel Mallet Associates to develop experimental procedures for multi-issue cume projection models to be applied in all Scarborough markets. Six markets were used in this work; in each market, we gathered a second interview in 1992. Therefore, the input variables for the model were the following:

1. "Past 7 days" screening question for weekday reading qualification.
2. "Yesterday" readership question.
3. Second observation for "yesterday reading."

It should be noted that Scarborough's current practice in one-interview markets is to use the "past 7 days" screener as the measurement for five-issue weekday cumulative audience. The mission assigned to Dan Mallett was to develop an algorithm that would replace the use of this screener as the basis for the five-day cume, and that would replicate the turnover rate expected from the two-interview design.

Because the newspaper industry has no "gold standard" as yet, there is not definitive evidence as to which method of cumulative audience estimation is the most accurate. However, the two-interview method is the de facto industry-encouraged standard in larger markets and the currently preferred method in a number of medium-sized markets as well.

While Mallet's work for Scarborough developed algorithms for both weekday and Sunday audiences, I will report here only on the weekday aspects of the work. All of these findings must be viewed as "works in progress," subject to further testing and review by the Syndicated Research Committee of the Newspaper Association of America.

A total of 97 weekday newspapers was included in the research. For each newspaper, the new model was tested through the following comparisons:

1. Average issue audience based on one-interview "yesterday" measurement.
2. Five-day cume audience based on "past 7 days" screener question.
3. Five-day cume audience based on Beta Binomial projection, using two observations.
4. Five-day cume audience based on new model.

Key comparison:

Difference between five-day cume based on Beta Binomial using two observations and the five-day cume based on the new model.

TABLE I

Newspaper	Ave. Issue	Two-Int. 5-Day Cume	One-Int. 5-Day Cume ("Past 7 Days" Screener)	Differ- ence	Modelled 5-Day Cume	Differ- ence
A	48.1%	68.3%	60.4%	-8.0	66.8%	-1.6
B	32.5	48.8	46.0	-2.9	51.7	+2.9
C	33.0	47.6	43.6	-4.0	49.1	+1.4
D	32.4	50.7	50.7	0.0	52.0	+1.2
E	31.2	45.7	39.1	-6.5	45.4	-0.3
F	29.9	49.5	40.2	-9.4	45.2	-4.4
G	28.9	44.4	41.6	-2.8	45.2	+0.8
H	21.9	37.3	29.5	-7.8	33.5	-3.7
I	20.2	32.5	27.3	-5.3	31.0	-1.5
J	13.8	19.7	19.0	-0.7	21.5	+1.8
Average (Mean) of 10 Papers	29.2	44.5	39.7	-4.8	44.1	-0.4

From the preceding table, it can be seen that the new model performs on the average within a close range of the actual two-interview cumulative estimates.

For the 10 largest newspapers analyzed, the average cume is 44.5% compared with the model's 44.1%. In eight out of ten cases above, the "past 7 days" screener produced a 5-day cume which was significantly lower than the two-interview result. On the average, this technique yielded cumes which were 4.8 percentage points lower than the two-interview method.

When the same comparison is extended to all 97 newspapers, the new model produces an average cume level which matches, within one-half of one percentage point, the level attained through the two-interview method.

The new model has also been found to work reasonably well for various population sub-groups, such as breakdowns by sex and age.

Scarborough has a strong preference for using the same model for all demographic and geographic sub-groups, for ease of application across studies.

We have found that separate models for different sub-groups would produce cume estimates that match almost exactly those produced by the two-interview method. However, pursuing this approach was not judged worthwhile, largely because it would greatly complicate model application.

Model Form

The new model for generating five-issue weekday newspaper cumes has regression-like form. The dependent variable is the sum of the two-interview Beta parameters and the independent variables are the screen-based multi-issue turnover and the average issue audience. (See Table II for an example of using the model to calculate a cumulative audience.)

This form is primarily an empirical result. Many alternative forms were tested and none fit the two-interview, multi-issue cumes as well. The alternatives tested included:

1. Different dependent variables, including turnover rates and alternative constructs of the two-interview Beta parameters.
2. Different independent variables -- the Beta parameters fit to the 7-day screen and average issue audience, and log and polynomial transformations of independent variables.
3. Different model forms, such as logit.

Despite the willingness to try many model forms and let results drive the final choice, there were some in-going preferences.

One was that the dependent variable be the sum of the two-interview Beta parameters. This procedure automatically forces reasonable bounds on model cume estimates without unduly constricting model form. In contrast, unrestricted models that directly estimate turnover or cume often include the possibility of absurd results such as cumes exceeding 100%.

Second and more important, as mentioned earlier, there was a general interest in keeping the model straightforward to assure proper, consistent application by Scarborough and Belden.

For this reason, the choice of independent variables was restricted to respondent-based values that could be directly tabulated or derived for the specific newspaper of interest. All input to the model comes from the respondents themselves, or is derived from this empirical database.

It should be noted that one of the independent variables used in the model is "past 7 days reading" from the screen-in question. Earlier in this paper, I stated that Scarborough was planning to conduct research to test the feasibility of doing away with the "past 7 days" screen, as NADbank has implemented in Canada. Clearly our model for newspaper cumulative audiences must be revised at that time, employing some other indicator of cumes. We are exploring the alternative of adding "frequency of reading" questions on an individual newspaper basis as a replacement.

The Next Steps

During the remainder of 1993, Scarborough will present the findings of Daniel Mallet's work, along with additional tests we will conduct internally, to the Syndicated Research Committee of the NAA. Our goal is to replace the second-interview technique with the new model for producing newspaper cumulative audiences in our 1994 program of research.

TABLE II

EXAMPLE OF WEEKDAY CUMULATIVE AUDIENCE - MODEL CALCULATION

The Weekday and Sunday models use the same approach and input arguments. In either case, the sum of the Beta parameters for the paper/group is estimated by an empirically derived formula that uses the tabulated average issue audience and the screen-based turnover for the paper and group of interest (these are not the Beta-parameters gotten by fitting the Beta to the average issue audience and the screen-based multi-issue cume).

For Weekday papers:

$$S = .01 + 0.78 \times (\text{SCREEN}/C1 - 1) + .0075 \times C1$$

Where: S = Model-based sum of Beta parameters
 SCREEN = "Past Week" Screen-in %
 C1 = Average Issue Audience %

Beta Parameters:

$$\begin{aligned} A &= C1/100 \times S \\ B &= (1 - C1/100) \times S \end{aligned}$$

5-Issue Cume % =

$$100 \times \left\{ 1 - \frac{B \times (B+1) \times (B+2) \times (B+3) \times (B+4)}{S \times (S+1) \times (S+2) \times (S+3) \times (S+4)} \right\}$$

Example:

$$\begin{aligned} C1 &= 20\% \\ \text{SCREEN} &= 25\% \end{aligned}$$

$$\begin{aligned} S &= .01 + 0.78 \times (25/20 - 1) + .0075 \times 20 \\ &= .01 + 0.78 \times (1.25 - 1) + .0075 \times 20 \\ &= .01 + .195 + .15 \\ &= .355 \end{aligned}$$

$$\begin{aligned} A &= 20/100 \times .355 = .071 \\ B &= 80/100 \times .284 \end{aligned}$$

5-Issue Cume % =

$$100 \times \left\{ 1 - \frac{0.284 \times 1.284 \times 2.284 \times 3.284 \times 4.284}{0.355 \times 1.355 \times 2.355 \times 3.355 \times 4.355} \right\}$$

$$100 \times \{ 1 - .708 \} = 29.2\%$$

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