## MAGAZINE AUDIENCE ACCUMULATION: DISCUSSION OF RESEARCH ISSUES, MODELING AND APPLICATION

## Julian Baim, Martin R. Frankel, Joseph Agresti and Risa Becker, MRI-NOP World

Measuring readership accumulation for more than a handful of magazines and within reasonable costs is a daunting challenge, which is probably why no empirical research had been undertaken in this area during the past two decades. MRI began the task of measuring accumulation by carrying out a number of pilot studies in 1998 and 1999. Historical attempts by others to estimate accumulation, the theoretical underpinnings of the present methodology, descriptions and results of its pilot testing and pretesting, and a discussion of the modeling of accumulation curves were covered in two papers presented at the November, 1999 Worldwide Readership Research Symposium in Florence, Italy.

A number of methodologies might be employed to capture accumulation; all have inherent advantages and disadvantages and make tacit assumptions about the shelf life of magazines and about the ability of respondents to understand the concept of "first-time read." When all these factors are considered, we believe the diary does the best job of measuring audience velocity, requiring the fewest preconceptions and offering the best means of assessing the validity of responses.

The final study consisted of 10,615 diarists, spread across sixteen weeks of measurement. The sampling frame comprised panelists from NPD's existing panel and was stratified disproportionately to oversample males, 18-44 year old, and employed panelists. The final sample disposition was:

	Total Adults	Male	Female
Mailed Out	24,600	14,356	10,244
Returned	12,646	6,646	6,000
Invalidated	2,031	1,436	595
Completed/In-Tab	10,615	5,210	5,405
Completion %	43.2%	36.3%	52.8%

# Table 1Final Sample Disposition

The methodological and procedural decisions governing the research are presented here, with commentary in *italics*. Along with this discussion is a description of how the new curves compare to those in use for the past several decades and examples detailing the utility of magazine accumulation data in media planning.

## Methodological Issue Overview

Once the diary method was adopted, we still confronted a number of critical issues that ultimately impact the shape of the curve and the curve's starting point. Among these issues are:

- Establishing a magazine's on-sale date
- Establishing a magazine's shelf life
- Editing the diaries for logical entries
- Evaluating the reasonableness of the findings
- Identifying the predictors of accumulation
- Mapping the magazines for modeling purposes
- Clarifying the differences between these results and prior data

## **On-Sale Date**

Most magazine information sources present very specific on-sale dates for individual magazine issues. These dates are generally interpreted to mean that a specific issue of a magazine is **first available** to either subscribers or to single-copy buyers on that particular day. During the course of the study, respondents claimed readership, first- and other-time, prior to the promulgated on-sale date for many magazines. These discrepancies initially raised issues about the validity of the diary method. Further research, however, uncovered the fact that on-sale date does not mean that an issue first becomes available on that day. It was clear that magazines, especially bi-weeklies and longer interval publications, are obtained prior to their putative on-sale dates.

Comment: Procedures for measuring magazine audience accumulation that use on-sale dates rather than earliest readership opportunity dates will produce truncated accumulation curves.

At the same time, this knowledge also meant that MRI had somehow to establish first available dates for every magazine in the study. MRI's position was straightforward: let the data decide. For all publications, MRI allowed first-time readership to be recorded prior to the stated on-sale date of the issue whenever respondent responses indicated that reading before the on-sale date was not an isolated occurrence or a diary entry error. The data for tri-weekly publications further reinforced this decision because it was evident that respondents, well prior to the on-sale date, were accurately recording issue dates (month/week/year) without any possible knowledge of the correctness of those dates.

One problem remained: how to establish first available dates for magazines with very low diary respondent counts. Lacking specific information for each magazine, MRI established common, earliest first-time available dates for all magazines within a publication frequency.

Comment: In a few cases, this modeling may produce artifactually elongated readership accumulation curves by crediting readership earlier than a magazine's actual earliest availability. Without a much larger sample for the smaller circulation magazines and without specific availability dates for each specific issue, this was the most reasonable solution to an otherwise intractable problem.

## A Magazine's Shelf Life

An assumption of earlier accumulation research was that weeklies and monthlies had maximum shelf lives and that no first-time readership occurred after those specified timeframes. This assumption was reflected in the methodology itself; the studies measured first-time readership of specific issues only within six to thirteen weeks of a magazine's on-sale date. As a result, all accumulation curves reached 100% at the arbitrarily, albeit reasoned, established limit.

The diary methodology does not require such assumptions. Respondents were instructed to record readership, first-time and other, of issues with no limitation. Respondents could record reading of two-, three- or even ten-year-old issues. This had a profound impact on the shape of the accumulation curves. If first-time readership were possible over a longer period of time than previously acknowledged, an issue's audience would take substantially longer to reach full accumulation. The published curves reflect this distinction.

Before accepting the longer shelf-life premise, MRI examined a number of diaries reporting first-time issue readership of old issues. We undertook this review to ensure that the curves were not being elongated spuriously. This examination included looking over a number of diaries containing old issue readership to ensure that respondents weren't consistently recording first-time readership for all entries in their respective diaries. If this were true for a large number of cases, MRI would have felt compelled to be skeptical of old issue first-time reading of certain respondents. In fact, there was little evidence to suggest misstatement of reading by respondents. Diaries with first-time readership of old issues showed within-diary variation; some readings were first-time while others were not.

MRI also examined incidences of old issue first-time reading for a prominent weekly and monthly. In almost every instance, the respondent properly and accurately recorded the issue date of the weekly, even though the issue was published longer than 180 days ago. No editing was required. There was not a single diary in which a respondent recorded only first-time reading events for all magazine readership. This indication of response accuracy also obtained for the monthly publication. Based on these findings, MRI concluded that first-time reading of old issues was valid.

Long shelf lives have an obvious and dramatic impact on the velocity of accumulation and clearly differentiate the MRI accumulation curves from previously developed ones. It might be argued that a respondent who read a very old issue is incapable of recalling readership of that same issue which might have occurred some six or more months ago. Although we cannot reject this contention out of hand, MRI found no compelling reason to disregard first-time reading of old issues.

## **Diary Editing: Logic and Philosophy**

The diary method afforded MRI the opportunity to review the logic and consistency of respondent entries. MRI developed editing rules ensuring that:

- No issue could be read for the first time more than once.
- All first-time reading of an issue preceded any additional reading.
- Entries with incorrect issue dates (most applicable for weeklies, biweeklies and triweeklies) were rejected if they matched the read date.
- If the first available date of a magazine occurred at any time during the diary week, any diary reading entry of that magazine on that date or subsequent to that date must be considered "first-time," excepting the first rule above.
- Standardize issue date assignment for "no answers" among weeklies, biweeklies and triweeklies where month of issue was entered but date of issue was omitted

MRI established these editing procedures after carefully reviewing many individual diaries. These rules address the issue whether respondents recorded a valid issue date and, more importantly, whether respondents understood the concept of "first time read."

This latter problem is critical. In other attempts to study accumulation (i.e., showing specific issues), the methodology precludes the researcher knowing in most cases whether respondents understood "first time reading." Only if a magazine is shown to a respondent **within the first week** of its availability can the previously employed methodology establish the veracity of response. This is not possible for subsequent weeks of interviewing. Respondents can reply either "yes" or "no" to the first time read question and the researcher will not know with any certainty whether respondents understood the question. On the other hand, the diary supplies a logical trail of information within the week and provides substantial clarity about a respondent's understanding of the "first time reading" concept.

MRI extended its analysis of the editing rules by exploring the impact of minimal and maximal editing procedures on the shape of the accumulation curves. The results were illuminating. Since the editing rules affected the curves of weeklies, biweeklies and tri-weeklies more so than other magazines, we examined those publication intervals more extensively. The editing had slightly greater effects on weeklies, but even there the impact was minimal. The following table (Table 2) demonstrates this finding for a number of prominent magazines:

## Table 2Editing Impact on Accumulation

			TV Guide (Weekly)		
			Raw Data		
Issue	Minimal	Editing Out		Maxima	al Editing
Age	In Home	Home		In Home	Out Home
Day 1	5.84	10.81		6.17	10.77
Day 7	90.56	78.38		89.47	70
Day 14	98.88	93.24		98.67	93.08
Day 21	99.1	97.3		99.15	98.46
		Ν	ewsweeklie	es	
Day 1	11.36	4.81		10.99	4.11
Day 7	73.38	35.44		72.09	32.71
Day 14	87.79	58.73		87.56	57.36
Day 21	91.58	68.35		91.48	67.29
		Re	ader's Digo (Monthly)	est	
Day 1	40.89	13 42	(wontiny)	40 97	13 42
Day 7	50.9	18.12		49.58	17.45
Day 14	58 55	26.17		58.61	26.17
Day 21	66.06	35.91		64.12	36.24
		Spo	orts Illustra	nted	
Day 1	11.99	7.60	(weekly)	11.67	7.03
Day 7	74.26	18 72		75.42	18 78
Day 14	88.12	71 79		87.5	40.78 67.68
Day 21	90.59	75.64		90	70.73
			People		
Day 1	13.68	53	(weekly)	13 33	5.09
Day 1 Day 7	60.97	31.44		13.33 58.46	25
Day 1/	78.63	55.3		77.60	23 52.78
Day 14 Day 21	85.47	67.05		84.36	64.12
		<b>N</b> T (* 17	- ··	04 d1 \	
Day 1	2 05	National (	Jeographic	(Monthly)	1 14
Day I	2.85	1.10		2.83	1.10
Day /	9.55	1./3		9.35	1./3
Day 14	24.80 28.21	5.20 10.40		24.80 28 21	5.20 10.40
Day 21	30.21	10.40		30.21	10.40

#### "Reasonability" Findings

After the data editing rules were established and implemented, MRI initiated an additional assessment of the results. We compared the shape of the accumulation curves for first-time reads to the accumulation curves for all first reading occasions in the week. We made this comparison to explore the possible impact of respondents' misunderstanding "first time read" on the shape and velocity of the curves. (Although our pilot studies failed to uncover any substantial level of misunderstanding, we felt compelled to explore this issue yet again.)

We discovered that the first-reading occasion in the week curves lagged several days behind the first-time read curves but, at the same time, had similar shapes. (See Charts 1-8 below.) This finding reassured MRI that these data were robust and instilled even greater confidence in the validity of the delivered accumulation curves. Unless misunderstanding "first time read" is more likely to occur among "late issue readers" than among "early issue readers" (or vice-versa), the shape of the final accumulation curves would remain unchanged even if there were any misunderstanding of the "first time read" question.



















#### **Developing Predictors**

The limitations of a sample of even 10,000 and the consequent small respondent counts for individual magazines required modeling of many of the individual accumulation curves. MRI approached this issue by using logistic regression to identify the key predictors of accumulation and to develop a typology of magazines with shared characteristics.

Our earlier presentation acknowledged that the diary method produces average issue audience estimates different from the recent reading method. The proportions of in-home and out-of-home readership and the demographic compositions of the audience also differ. Despite the data divergences resulting from the two methodologies, it is not immediately clear whether it is necessary to adjust the audience composition data from the diaries.

To determine this, we first needed to identify critical explanatory variables of the rate of readership accumulation and then to assess their relative contributions to the shape of the accumulation curve. The diary contained a number of demographic variables: gender, age, education, and employment status. In addition, NPD had previously measured a number of geodemographic variables for each panelist, among them Census region and county size. Finally, MRI appended several magazine attribute variables to the accumulation file, including percentage of subscribers, reader-per-copy levels (from the national study), publication interval, and editorial category.

Using this enhanced file, we were able to identify critical explanatory variables of accumulation rates. MRI used a logistic regression procedure to examine which, of all the independent variables, had a significant and substantial role in determining the shape of the velocity curves. The publication interval variable allowed us to perform this analysis separately for weekly and for monthly magazines. (Since our Florence paper had already established the vital role publication interval played in driving the accumulation curves, it was crucial to conduct these regression analyses separately by publication interval.)

For each publication interval set of magazines, MRI conducted multiple logistic regressions of first-time readership at several points in time following the first available day of reading. For weekly magazines, the regression analysis was repeated for day 0, day 3, day 7, and day 14. The comparable points of reference for monthly magazines were day 0, day 7, day 14 and day 30. Replicating the regression analysis over time investigated the possibility that different factors affect accumulation at different points in the life of an issue.

Logistic regression provides odds ratios for each of the independent variables; interpreted as the relative impact that variable plays in determining the probability of the occurrence of the dependent variable (first time read at each juncture). Variables with odds ratios substantially different from 1.0 have greater impact on the rate of accumulation. If the odds ratio is significantly greater than 1, that variable increases the probability of first-time readership at that time period. Conversely, those variables with odds ratios significantly below 1 have a lower probability of producing first-time readership. Testing also determines whether the odds ratios are statistically significantly different from 1.0, whether or not the ratio is **substantially** different from 1.0. MRI examined both the substance and the size of every odds ratio. (Tables 3 and 4 show the odds ratios for critical variables at different points in time.)

For weekly magazines, place of reading (in-home/out-of-home) and editorial groupings were substantial and significant variables in all four regression analyses. Demographic variables such as education, age, and income were significant at only some of the time periods. Interestingly, high-subscription proportions had a material impact on accumulation at day 0 but were not continuously significant thereafter. This finding **suggests** that many subscribers to weekly magazines read the publications almost immediately after receiving their copies, thereby concentrating the accumulation of weeklies at the earliest stage of their shelf lives. By the end of the first week, we conjecture that passalong and newsstand copy readers diminish the impact of subscription rates on accumulation.

The regression analyses for monthlies identified the same variables -- place of reading and editorial groupings – as significant determinants of accumulation. Once again, some demographic variables including education and income were significantly if only modestly related to the likelihood of first time readership. Similarly, subscription proportion significantly increased the odds of first-time readership patterns at the earliest stages of a monthly magazine's shelf life, but its importance waned at later stages.

MRI next needed to apply the findings of these regression analyses to provide unique curves for each magazine reported in our national study. A requirement of this or any other first-time reading study is sample size adequate to obtain a sufficient number of first-time readers for every magazine. Despite a sample of more than 10,000 diarists, some measured magazines did not obtain as many as 50 first-time reads. In these cases, MRI combined empirical data for the individual magazine with its associated (from the logistic regression) groups. Thus, each magazine's curve comprised any unique accumulation data for the magazine plus empirical accumulation data for the magazine's reference group(s). The weighted combination of these two curves creates the accumulation curve for each magazine. (Those magazines with large in-tab counts did not require the application of any reference group data.) Respondent counts for the larger magazines and all reference groups are shown below (see Table 5). The table shows that even the smallest reference group contained 271 respondents.

	v	8		
Variable Name	Day 0	Day 3	Day 7	Day 14
Read In Home	2.440*	3.687*	4.066*	NA**
Group 4/Group 1	NS	1.305*	.132*	.087*
Group4/Group 2	2.254*	1.523*	1.657*	2.028*
Group 4/Group 3	.541*	.717*	.724*	.825*
County Size 4/1	.724*	NS	NS	NS
County Size 4/2	NS	NS	NS	NS
County Size 4/3	NS	NS	NS	NS
High RPC	NA**	NS	1.245*	NS
Low Subs	NA**	NS	NS	NA**

## Table 3 **Odds Ratios of Initially Significant Variables** Weekly Magazines

\* Significant at the 95% confidence interval using the Wald Test \*\* Not Available Because of Significant Interactive Effects

Odds Ratios Coefficients of Initially Significant Variables Monthly Magazines										
Variable Name	Day 0	Day 7	Day 14	Day 30						
Read In Home	4.029*	4.034*	3.952*	3.812**						
Group 12/Group 1	.456	.636*	.728*	.741*						
Group12/Group 4	1.373*	NS	NS	NS						
Group 12/Group 6	.712*	.658*	.729*	.724*						
Group 12/Group 9	.629*	.622*	.657*	NS						
Low Subs	825	836*	NS	NS						

Table 4
<b>Odds Ratios Coefficients of Initially Significant Variables</b>
Monthly Magazines

\* Significant at the 95% confidence interval using the Wald Test \*\* Not Available Because of Significant Interactive Effects

Magazine or Group	Total Male	Total Female	Total Adults	Magazine or Group	Total Male	Total Female	Total Adults
TV Guide	514	670	1184	Ref Group 1	52.7	2912	3439
Reader's Digest	458	560	1018	Ref Group 2	1642	1521	3163
Parade	405	459	864	Ref Group 3	538	580	1118
People	261	561	822	Ref Group 4	778	171	949
Better Homes	149	422	571	Ref Group 5	158	750	908
Time	309	253	562	Ref Group 6	274	617	891
Good Housekeeping	87	467	554	Ref Group 7	294	527	821
Newsweek	319	229	548	Ref Group 8	169	590	759
Family Circle	57	471	528	Ref Group 9	606	93	699
Woman's Day	27	394	421	Ref Group 10	443	190	633
National Geographic	251	168	419	Ref Group 11	169	218	387
Sports Illustrated	321	83	404	Ref Group 12	194	91	285
Ladies Home	40	334	374	Ref Group 13	115	156	271
U.S. News	232	134	366				
McCall's	45	299	344				
Entertainment Weekly	148	152	300				
Redbook	49	229	278				
Parenting	80	183	263				
USA Weekend	133	120	253				
Glamour	40	192	232				
Cosmopolitan	47	184	231				
Parents	51	171	222				
Field & Stream	165	35	200				
Soap Opera Digest	20	175	195				
Martha Stewart	39	152	191				
Car & Driver	165	24	189				
Prevention	55	130	185				
Woman's World	8	176	184				
National Enquirer	62	108	170				

 Table 5

 First-Time Reader Respondent Counts For Selected Magazines and Reference Groups

Along with this modeling, MRI needed to conform place of reading proportions from the diary study to the national study. (Table 6 below provides examples of the differences in place of reading between the diary study and the national ratings study.) Differences among audience levels generated by different measurement methodologies are in no small part attributable to their ability to capture out-of-home readership. Regression analysis further indicates these differences are reflected in the shape of the accumulation curves. Given the critical importance of place of reading on first-time readership and the need to generate curves for all magazines in the national study, adjusting the proportions of in-home and out-of-home readership was imperative.

## Table 6

Diary						Syndicated				
		Male	Female				Male	F	emale	
Name	In Home	Out of Home	In Home	Out of Home		In Home	Out of Home	In Home	Out of Home	
TV Guide	89.49%	10.51%	88.66%	11.34%		82.23%	17.77%	81.52%	18.48%	
Reader's Digest	68.56%	31.44%	72.50%	27.50%		69.07%	30.93%	68.41%	31.59%	
Parade	88.64%	11.36%	94.12%	5.88%		92.67%	7.33%	93.47%	6.53%	
People	43.68%	56.32%	49.20%	50.80%		36.46%	63.54%	40.44%	59.56%	
Better Homes & Gardens	40.94%	59.06%	48.82%	51.18%		58.87%	41.13%	55.86%	44.14%	
Time	59.22%	40.78%	58.50%	41.50%		40.91%	59.09%	47.74%	52.26%	
Good Housekeeping	42.53%	57.47%	50.54%	49.46%		62.45%	37.55%	53.94%	46.06%	
Newsweek	63.64%	36.36%	51.97%	48.03%		36.28%	63.72%	43.47%	56.53%	
Family Circle	54.39%	45.61%	64.54%	35.46%		63.38%	36.62%	56.22%	43.78%	
Woman's Day	59.26%	40.74%	72.34%	27.66%		66.60%	33.40%	53.59%	46.41%	
National Geographic	57.77%	42.23%	60.12%	39.88%		51.32%	48.68%	54.39%	45.61%	
Sports Illustrated	59.19%	40.81%	60.24%	39.76%		45.60%	54.40%	57.21%	42.79%	
Ladies' Home Journal	42.50%	57.50%	50.60%	49.40%		76.22%	23.78%	51.96%	48.04%	
U.S. News & World Report	65.95%	34.05%	64.18%	35.82%		41.90%	58.10%	45.72%	54.28%	
McCall's	48.89%	51.11%	47.16%	52.84%		62.23%	37.77%	48.49%	51.51%	
Entertainment Weekly	67.57%	32.43%	65.79%	34.21%		48.12%	51.88%	47.41%	52.59%	
Redbook	42.86%	57.14%	39.74%	60.26%		52.55%	47.45%	48.57%	51.43%	
Parenting	55.00%	45.00%	49.18%	50.82%		62.00%	38.00%	44.36%	55.64%	
USA Weekend	90.23%	9.77%	90.08%	9.92%		91.97%	8.03%	92.67%	7.33%	
Glamour	30.00%	70.00%	41.67%	58.33%		48.18%	51.82%	42.52%	57.48%	
Cosmopolitan	38.30%	61.70%	39.67%	60.33%		43.47%	56.53%	52.51%	47.49%	
Parents Magazine	64.71%	35.29%	51.46%	48.54%		62.01%	37.99%	45.99%	54.01%	
Field & Stream	33.33%	66.67%	40.00%	60.00%		43.54%	56.46%	61.22%	38.78%	
Soap Opera Digest	50.00%	50.00%	62.86%	37.14%		75.09%	24.91%	57.05%	42.95%	
Martha Stewart Living	53.85%	46.15%	41.45%	58.55%		65.55%	34.45%	55.56%	44.44%	
Car & Driver	32.12%	67.88%	37.50%	62.50%		37.57%	62.43%	59.11%	40.89%	
Prevention	52.73%	47.27%	62.31%	37.69%		69.16%	30.84%	64.31%	35.69%	
Woman's World	62.50%	37.50%	76.14%	23.86%		76.32%	23.68%	54.31%	45.69%	
Life	26.60%	73.40%	39.53%	60.47%		25.94%	74.06%	31.71%	68.29%	
National Enquirer	61.29%	38.71%	66.67%	33.33%		38.88%	61.12%	47.13%	52.87%	
Modern Maturity	92.50%	7.50%	87.50%	12.50%		93.53%	6.47%	89.17%	10.83%	
Money	49.15%	50.85%	56.52%	43.48%		46.69%	53.31%	50.52%	49.48%	
Motor Trend	29.79%	70.21%	60.00%	40.00%		42.40%	57.60%	63.69%	36.31%	
Automobile	23.77%	76.23%	30.77%	69.23%		38.00%	62.00%	45.24%	54.76%	
PC Computing	45.10%	54.90%	42.22%	57.78%		42.45%	57.55%	54.36%	45.64%	
PC World	43.96%	56.04%	67.74%	32.26%		43.04%	56.96%	54.01%	45.99%	
Business Week	54.44%	45.56%	50.00%	50.00%		34.68%	65.32%	38.41%	61.59%	
Smithsonian	81.25%	18.75%	79.63%	20.37%		52.54%	47.46%	58.76%	41.24%	
Playboy	86.81%	13.19%	100.00%	0.00%		63.78%	36.22%	68.30%	31.70%	

#### **Comparison To Prior Models**

The MRI data not only highlighted differences between accumulation rates of publications within the same interval, but also represented dramatic differences from previously modeled accumulation curve.<sup>1</sup> Some of these distinctions are attributable to the divergent methodological approaches, but they are also driven by different underlying assumptions.

<sup>&</sup>lt;sup>1</sup> We gratefully acknowledge IMS and Telmar for providing us with examples of their internally developed accumulation curves and for permission to use these data in the paper.

Prior to the release of MRI's newly generated curves, two companies, IMS and Telmar, provided accumulation curves to the media and advertising communities. Both companies adjusted the findings of the Politz accumulation studies, conducted some forty years ago, to the changed magazine environment of the 1990s. As the following charts show, there are some sharp differences between the curves generated by the two companies. Nevertheless, there are three distinct areas where MRI's curves differ from both of the already-existing accumulation models: first-available date, shelf life and publication interval.

The traditional "first-time read yesterday" approach assumed readership could only begin on the on-sale date. Since our diary methodology made no such assumption, MRI found audiences accumulated earlier than previous research had shown. Audience accumulation prior to the stated on-sale date is particularly pronounced for monthly magazines. Charts 14-17, comparing accumulation curves for four monthly magazines (*Better Homes and Gardens, Marie Claire, Car & Driver* and *Kiplinger's Personal Finance Magazine*) show MRI finding substantial first-time reading prior to the on-sale date for all these publications. Neither of the existing models shows any readership during that time. This altered pattern of accumulation dramatically affects schedules based on weekly reach for monthly magazines, especially at the initial stages of a magazine's shelf life.

Earlier research assumed not only rapid initial accumulation but also assumed a constant shelf life for every publication within the like publication intervals. For example, Charts 9-13 shows that five weekly magazines in IMS's system (*Business Week, Newsweek, Time, People* and *Sports Illustrated*) achieve 100% of their accumulation by the end of the fifth week. MRI's curves for these respective magazines, which employ almost exclusive empirical data for four of the magazines, show that the five-week assumption cannot be sustained. These charts and table 7 also demonstrate that the five magazines achieve different proportions of total first-time reading by the end of the fifth week and also that they have very different accumulation patterns well after the fifth week. By contrast, although Telmar weekly magazine curves reach full accumulation well after the fifth week, their modeled shelf lives are still somewhat abbreviated compared to MRI.

The assumption of fixed, coterminous shelf lives was made in previous research for monthlies as well. Charts 14-17 show IMS curves assume monthlies achieve total accumulation by the end of the tenth week. MRI's observed accumulation percentages for these same magazines at the end of their tenth week, ranging from 77% to 89%, are shown in Table 7. The differences in accumulation patterns between the old and new curves are stark. Once again, Telmar curves more closely approximate the new MRI curves, but differences between the two sets of curves remain.

The shapes of the curves underline a third critical difference between the old and new models. By collecting substantially more empirical data across a more ambitious roster of magazines, MRI found significant variations in accumulation patterns between magazines of similar publication frequencies. For example, in the case of weekly publications, the old curves appear to make only subtle distinctions between titles with different readers-per-copy, different place of reading patterns and different editorial content and timeliness. *People* magazine, with substantially higher readers-per-copy and public place reading proportions, shows only a minor difference in it accumulation curve from the other weeklies in the IMS system. Table 7, below, shows the IMS range of first-time reading proportions for the five publications after the first week varies between 53.3% and 56.2%. In effect, these numbers suggest that accumulation curve differences are nuances; that velocity patterns are practically constant within publication frequencies. Telmar makes much sharper distinctions among different weekly publication accumulation curves in its model, although these distinctions are not always similar to the MRI curves. MRI's study clearly illustrates that accumulation curves are quite varied and that magazines uniquely possess attributes that drive the shape of their accumulation curve. For example, MRI's curves show the first-week reach of the five weekly publications range from 38% to 59% (see Table 7).

#### Media Planning: Applying The Curves

The accumulation study not only revises previously held assumptions about how magazine audiences accumulate, but it also adds knowledge to the magazine planning and buying process. Following is an example of how the new curves impacted the selection of specific issues within a schedule developed from an optimization program.

At the first stage, a reach-optimizer program selected a schedule of 20 ad insertions across 10 magazines using a budget of \$2,000,000 for a six-month campaign. Without any guidelines for the specific issue selections of these magazines, the insertions were initially made in the earliest issues of the selected publications. Chart 18 shows selecting these early issues leads to a dramatic decline in weekly GRPS by the end of the  $15^{th}$  week of a 26 week campaign (see the before line in the chart). If the intent of the campaign is to ensure a continuous steady flow of ad exposures across the life of the campaign, then the initial selection pattern fails to achieve this goal. MRI then used an iterative process to revise the issue-specific selections for the selected magazines. The altered selections (see the after line in the chart) provide a relatively even number of weekly GRPs across the six-month period. Without reliable weekly accumulation data, informed changes in the issue-selection process are not possible.

Two additional planning benefits accrue from the accumulation curves. First, the more valid accumulation of first-time reads prior to on-sale date and the more accurate measure of shelf life enable the planner to avoid using specific issues where issue exposure begins either well before or well after the life of a particular advertising campaign. More importantly, weekly reach and GRP estimates enable magazines to compete more effectively against other media. Planners can now examine how magazines work within a multimedia campaign and magazines can demonstrate the cost efficiencies of print insertions to increase weekly reach or to ensure a continuous flow of ad exposures.

#### Summary

The issues involved in measuring magazine audience accumulation are obviously complex. The inherent difficulties and costs of conducting a magazine accumulation study can be overwhelming. This paper clearly illustrates the myriad of decisions required to produce modeled curves, beginning with selecting the appropriate method for capturing this type of information. Without the use of some passive measuring device to capture all readership, any methodology must grapple with respondents' understanding of the "first-time read" concept. This, alone, is a daunting challenge.

Beyond the methodological decision, reasoned judgment was applied to the editing and modeling phases of the study. At every stage, MRI evaluated the reasonability and impact of its procedures on the resulting curves. As always, we would have preferred an even larger sample, measuring even more magazines with greater reliability. Still, we believe the new curves more accurately reflect magazines' shelf lives, capture distinct differences in accumulation patterns across a large spectrum of magazines and place magazines on an equal footing with other media.

At present, we are working with NOP-UK on a study of print audience accumulation in the United Kingdom. We fully endorse additional research, hoping that the additional data will enhance our knowledge of magazine audience accumulation.



#### Chart 9

#### **Business Week**

## Charts 10 & 11

## Newsweek





Time

179



People





Sports Illustrated

### Charts 14 & 15



## **Better Homes & Gardens**



Marie Claire

## Charts 16 & 17





## Kiplinger's Personal Finance Magazine



Week	Business Week				Newsweek			Time			
	MRI	Telmar	IMS	MRI	Telmar	IMS	MRI	Telmar	IMS		
0	3.20%	0.00%	0.00%	2.36%	0.00%	0.00%	2.40%	0.00%	0.00%		
1	44.49%	66.98%	55.17%	47.05%	55.11%	56.18%	50.71%	56.41%	54.60%		
2	68.71%	81.40%	80.84%	70.92%	73.66%	81.85%	68.82%	76.57%	79.60%		
3	78.02%	88.37%	90.43%	78.08%	84.19%	90.92%	74.64%	89.10%	90.40%		
4	82.23%	93.49%	96.81%	81.68%	92.31%	96.97%	79.14%	92.57%	97.10%		
5	87.86%	95.81%	100.00%	84.73%	95.00%	100.00%	83.11%	94.99%	100.00%		
6	89.95%	97.21%	100.00%	86.56%	96.52%	100.00%	85.04%	95.95%	100.00%		
7	92.82%	98.60%	100.00%	88.70%	97.15%	100.00%	86.66%	96.43%	100.00%		
8	93.31%	98.60%	100.00%	89.57%	97.68%	100.00%	88.56%	97.01%	100.00%		
9	94.17%	99.07%	100.00%	90.21%	98.31%	100.00%	89.51%	97.49%	100.00%		
10	94.68%	99.53%	100.00%	91.35%	98.84%	100.00%	90.51%	97.97%	100.00%		
11	95.40%	99.53%	100.00%	92.31%	99.47%	100.00%	91.08%	98.55%	100.00%		
12	95.66%	100.00%	100.00%	93.21%	100.00%	100.00%	91.50%	99.04%	100.00%		
13	96.01%	100.00%	100.00%	93.97%	100.00%	100.00%	91.95%	99.52%	100.00%		
14	97.20%	100.00%	100.00%	94.46%	100.00%	100.00%	92.05%	100.00%	100.00%		
15	98.05%	100.00%	100.00%	94.68%	100.00%	100.00%	92.76%	100.00%	100.00%		
16	98.13%	100.00%	100.00%	94.93%	100.00%	100.00%	92.96%	100.00%	100.00%		
17	98.18%	100.00%	100.00%	95.22%	100.00%	100.00%	93.44%	100.00%	100.00%		
18	98.24%	100.00%	100.00%	95.68%	100.00%	100.00%	93.44%	100.00%	100.00%		
19	98.31%	100.00%	100.00%	95.96%	100.00%	100.00%	93.71%	100.00%	100.00%		
20	98.34%	100.00%	100.00%	95.96%	100.00%	100.00%	93.71%	100.00%	100.00%		
21	98.40%	100.00%	100.00%	96.28%	100.00%	100.00%	93.71%	100.00%	100.00%		
22	98.45%	100.00%	100.00%	96.49%	100.00%	100.00%	93.94%	100.00%	100.00%		

 Table 7

 Comparison of MRI Accumulation Curves With Prior Models

 Table 7 (Continued)

 Comparison of MRI Accumulation Curves With Prior Models

Week	< People			Spc	Sports Illustrated			Better Homes & Gardens		
-	MRI	Telmar	IMS	MRI	Telmar	IMS	MRI	Telmar	IMS	
0	2.37%	0.00%	0.00%	3.71%	0.00%	0.00%	8.69%	0.00%	0.00%	
1	38.39%	51.81%	53.29%	59.88%	57.92%	55.35%	21.66%	35.54%	32.50%	
2	63.02%	69.23%	78.60%	75.93%	73.07%	81.52%	31.13%	46.38%	53.00%	
3	72.30%	78.15%	90.08%	79.23%	80.00%	91.72%	40.98%	54.31%	63.30%	
4	76.95%	84.73%	96.96%	82.65%	83.86%	97.40%	48.65%	62.24%	72.50%	
5	81.46%	87.53%	100.00%	86.16%	86.24%	100.00%	56.69%	70.22%	81.20%	
6	84.22%	89.69%	100.00%	88.93%	88.42%	100.00%	62.32%	77.12%	89.10%	
7	85.88%	91.32%	100.00%	91.20%	90.50%	100.00%	68.01%	81.57%	93.80%	
8	87.93%	93.01%	100.00%	92.26%	92.67%	100.00%	72.08%	84.94%	96.70%	
9	89.28%	94.70%	100.00%	93.66%	94.75%	100.00%	74.77%	87.62%	98.60%	
10	90.40%	95.92%	100.00%	94.83%	96.93%	100.00%	77.96%	90.36%	100.00%	
11	91.37%	97.14%	100.00%	95.12%	98.02%	100.00%	80.12%	91.73%	100.00%	
12	92.19%	98.25%	100.00%	95.17%	98.51%	100.00%	82.14%	93.15%	100.00%	
13	92.81%	98.54%	100.00%	95.96%	98.91%	100.00%	84.55%	94.30%	100.00%	
14	93.63%	98.78%	100.00%	96.08%	99.31%	100.00%	86.30%	95.38%	100.00%	
15	93.97%	99.01%	100.00%	96.45%	99.41%	100.00%	87.67%	95.95%	100.00%	
16	94.62%	99.24%	100.00%	97.67%	99.60%	100.00%	88.89%	96.46%	100.00%	
17	94.88%	99.53%	100.00%	97.67%	99.70%	100.00%	89.39%	97.03%	100.00%	
18	95.31%	99.59%	100.00%	97.88%	99.80%	100.00%	90.47%	97.60%	100.00%	
19	95.66%	99.59%	100.00%	97.88%	100.00%	100.00%	90.81%	98.12%	100.00%	
20	96.15%	99.65%	100.00%	97.88%	100.00%	100.00%	91.06%	98.69%	100.00%	
21	96.30%	99.71%	100.00%	98.15%	100.00%	100.00%	91.06%	99.03%	100.00%	
22	96.60%	99.77%	100.00%	98.15%	100.00%	100.00%	91.58%	99.43%	100.00%	

Week	Car & Driver			Kipli	Kiplinger's Personal			Marie Claire		
	MRI	Telmar	IMS	MRI	Telmar	IMS	MRI	Telmar	IMS	
0	16.34%	0.00%	0.00%	22.38%	0.00%	0.00%	19.27%	0.00%	0.00%	
1	23.68%	29.02%	28.19%	40.08%	35.00%	44.22%	35.75%	28.78%	38.64%	
2	29.57%	39.06%	45.87%	50.87%	45.00%	67.19%	45.99%	43.88%	62.07%	
3	35.15%	47.32%	56.82%	58.78%	54.29%	73.36%	55.63%	56.83%	70.07%	
4	43.14%	53.13%	67.38%	67.57%	62.86%	79.49%	62.85%	69.06%	77.46%	
5	51.17%	58.93%	77.52%	73.76%	70.71%	85.65%	70.58%	76.26%	84.86%	
6	58.73%	63.84%	85.89%	79.24%	77.86%	90.57%	76.05%	82.73%	90.44%	
7	67.18%	68.53%	92.25%	82.67%	83.57%	94.68%	79.75%	89.21%	94.60%	
8	71.12%	73.21%	95.83%	85.14%	87.14%	97.14%	82.51%	91.37%	97.08%	
9	73.91%	77.23%	98.21%	87.43%	90.00%	98.79%	85.39%	94.24%	98.76%	
10	79.39%	80.58%	100.00%	88.99%	92.14%	100.00%	87.73%	94.96%	100.00%	
11	82.33%	83.71%	100.00%	90.30%	93.57%	100.00%	88.96%	96.40%	100.00%	
12	84.91%	86.83%	100.00%	91.23%	95.00%	100.00%	90.46%	97.12%	100.00%	
13	86.00%	89.73%	100.00%	92.12%	95.71%	100.00%	91.36%	98.56%	100.00%	
14	87.90%	92.41%	100.00%	92.29%	96.43%	100.00%	92.89%	99.28%	100.00%	
15	89.27%	94.64%	100.00%	93.43%	97.14%	100.00%	93.77%	100.00%	100.00%	
16	90.98%	95.54%	100.00%	93.84%	97.86%	100.00%	94.35%	100.00%	100.00%	
17	92.11%	96.65%	100.00%	94.53%	97.86%	100.00%	97.44%	100.00%	100.00%	
18	92.11%	97.32%	100.00%	94.60%	98.57%	100.00%	97.59%	100.00%	100.00%	
19	92.26%	97.77%	100.00%	96.44%	99.29%	100.00%	97.73%	100.00%	100.00%	
20	92.32%	98.44%	100.00%	96.66%	100.00%	100.00%	97.81%	100.00%	100.00%	
21	92.83%	98.88%	100.00%	96.71%	100.00%	100.00%	97.91%	100.00%	100.00%	
22	92.83%	99.33%	100.00%	96.71%	100.00%	100.00%	98.05%	100.00%	100.00%	

 Table 7 (Continued)

 Comparison of MRI Accumulation Curves With Prior Models

Chart 18 Using Accumulation Curves To Alter Scheduled Insertions

