AUDIENCE & PERFORMANCE GUARANTEES: A STATISTICAL MODEL FOR RISK ASSESSMENT

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INTRODUCTION AND BACKGROUND

Since 2005, magazines in the United States have been under increasing pressure to maintain revenue stream levels from advertising and from circulation. This strain has its root causes in the intensely competitive and burgeoning media landscape and, more importantly, from the continuing demand from agencies and advertisers for timely measures of accountability and ROI from the print media. One of the critical issues affecting print's competitive standing vis-à-vis other media is publishers' use of circulation rate base guarantees, a virtually unique phenomenon of the United States print industry, as the basis to negotiate cost-per-thousand copies with advertisers. These circulation-based guarantees are substantially different from audience-based guarantees provided by other media and have been subjected to criticism for being anachronistic and, at times, misleading.

A number of prominent print media executives, representing buyers and sellers, have been vocal about the need to move to a more relevant guarantee metric, either at an issue-specific audience level or, at an even more accountable ad-specific audience/ad action taken level. Among these advocates for change have been Brenda White of Starcom, Robin Steinberg of Mediavest, Betsy Frank of Time Inc. and Jack Kliger, former President/CEO of Hachette Filipacchi Media U.S. While their viewpoint may not be universally shared, they have made compelling arguments for moving away from circulation-based metrics as the basis of guarantees. This begs the question: If so many key players see the need for change, why has movement been so slow in this area?¹

The answer lies predominantly in the fear publishers have of relinquishing control of the rate-base metric to others using a different measure. As Jack Hanrahan maintains, "...publishers can exercise a high level of control over their ultimate circulation levels. They can't exercise the same level of control in syndicated magazine audience measurement because of issues like sample variation, respondent memory, and the like." (Hanrahan, 2011) In effect, the reluctance to shift metrics derives from an aversion to incur risk in a new system. This paper addresses the risk-reward issue, describes a system for both sellers and buyers of magazine advertising to negotiate guarantees at specific ad-audience levels and provides the statistical context behind the guarantee system.

We have used basic probability theory and methods to provide a Risk Management system that may be used to assess various probabilities of achieving certain audience and advertising delivery guarantees.²

This paper is divided into 4 basic sections:

- I. Theoretical Development of a system to determine probabilities associated with achieving audience and advertising delivery guarantees. This part will describe the statistical theory that allows for the computation of levels of risk associated with various levels of audience guarantees. Readers who are less mathematically inclined may wish to skip this section
- II. Application of the basic theoretical system to actual currency level audience estimation systems: GFKMRI Average Issue Audience Reports, Issue Specific Audience Reports and Starch Ad-Measure reports. This part describes a system (application) that has been developed to allow users to examine the specific risk levels for specific advertising schedules.

¹ Several magazines, including The Week and Scholastic Parent& Child, have offered guarantees based on ad impact.

² Wikipedia defines Risk Management "the identification, assessment, and prioritization of <u>risks</u> (defined in <u>ISO 31000</u> as *the effect of uncertainty on objectives*, whether positive or negative) followed by coordinated and economical application of resources to minimize, monitor, and control the probability and/or impact of unfortunate events or to maximize the realization of opportunities"

- III. Empirical validation of the System. This portion of the paper describes some of the empirical testing and simulations that have been applied to validate the theory developed in part I.
- IV. Further Research Needs and Plans. In this section we describe some of the outstanding issues associated with both the theory and implementation of the audience guarantee system. We also describe some of the proposed extensions of both the theory and the application.

I. Theoretical Development of a system to determine probabilities associated with achieving audience and advertising delivery guarantees

A basic audience guarantee is defined as a scalar value (the guarantee level), and a set of magazine issues and delivery conditions within the issue(s). In the development that follows we assume that the scalar and magazine issue(s) delivery condition(s) are expressed as totals rather than intersections or some other more complex sub-conditions.

For example an audience guarantee might be that a noting audience for a specific ad appearing on page 64 of the July 2, 2011 issue of Magazine A will be 10 million adults, or the July 11, 2011 audience of magazine B will be 20 million adults, or the gross number of adults noting ads on page 23 of the July 23th issue of magazine C or on page 35 of the August 3rd issue of magazine D will be 25 million adults.

In order to describe and assess various probabilities associated with the basic audience guarantee we let $X_1, X_2, ..., X_n$ denote random variables, one for each magazine issue and delivery condition audience. For example, suppose the guarantee involves the noting audience for a particular ad execution PG1 that appears in 2 issues of magazine A and 3 issues in magazine B and a different execution PG2 (for the same product) that runs in 2 different issues of magazine C. Then X_1 denotes the ad noting audience for the ad PG1 that appears in the first issue of magazine A; X_2 denotes the ad noting audience for the second issue of magazine A; X_3 denotes the ad noting audience for the APG1 that appears in the second issue of magazine A; X_3 denotes the ad noting audience for agazine B, and so on to X_7 which denotes that noting audience for ad PG2 that appears in the second issue of magazine C. In this case there are 7 random variables, X_1 through X_7 .

We assert, and later show by empirical demonstration, that each of these random variables, X_1 through X_7 may be approximated by a normal distribution with mean μ_i and σ_i^2 . The normality of the distribution of X_i follows from the central limit theorem applied to the estimated issue specific audience and ad noting score estimate. These are based on independent samples of size 2,500 and 125 respectively. While the product of two independent normal distributions follows a product-normal distribution, we show, in section III, that for this application, the distribution may be approximated by a normal random variable.

It should be noted that the true parameter associated with the guarantee will never be known with certainty because it is based on a sample estimate. However, since the satisfaction of the guarantee is based on this estimate, it will act as the relevant outcome parameter.³

The basic theorem that allows for the assessment of probabilities associated with audience guarantees is that the sum of two independent standard normal random variables is normal with mean zero and variance two. Symbolically if X $\sim N(0,1)$ and Y $\sim N(0,1)$, then X+Y $\sim N(0,2)$. This theorem may be extended to show that the sum of two independent Normal random variables with any particular means and variances is itself normal. Stated in symbolic terms if

Thus if $X \sim N(\mu_a, \sigma_a)$ and $Y \sim N(\mu_b, \sigma_b)$ then it follows that

³ This situation not only exists for print magazines, but for television and radio as well.

$$X + Y \sim N \left(\mu_{a+b}, \sqrt{\sigma_a^2 + \sigma_b^2} \right)$$

This result may be extended to include any linear combination of independent normal random variables as follows:

Let $X_1, X_2, X_3, \dots, X_k$ denote a vector of independently distributed normal random variables and let $a_1, a_2, a_3, \dots, a_k$ denote a vector of scalar constants, then

$$\sum_{i=1}^{k} a_i X_i ~\sim N (\mu_{lc} , \sigma_{lc})$$

Where

$$\mu_{lc} = \sum_{i=1}^{k} a_{i} \mu_{i}$$
$$\sigma_{lc} = \sqrt{\sum_{i=1}^{k} a_{i}^{2} \sigma_{i}^{2}}$$

This result allows us to assess the probability that the estimated gross audience for a specified set of ads running in a specified set of issues of magazines will fall within a set of specified bounds. In particular if we let $S = (s_1, s_2, ..., s_k)$, a particular schedule of ads running in various magazine issues, the probability that the defined audience will fall within limits t_1 and t_2 is given by:

$$P(t_1 < S < t_2) = \int_{t_1}^{t_2} \frac{1}{2\sqrt{\pi\sigma_s^2}} e^{-[(S-\mu_s)]^2/2\sigma_s^2} ds$$

If we define μ_i as the mean of the distribution of the ith issue-ad distribution and σ_i^2 as the corresponding variance of the issue-ad distribution we have

$$\mu_s = \mu_1 + \mu_2 + \dots + \mu_k ,$$

and

$$\sigma_s = \sqrt{\sum_{i=1}^k \sigma_i^2}.$$

We assume that estimates of μ_i and σ_i^2 are available from prior actual data. In section IV we discuss procedures that may be used when a sufficient number of prior values are not available.

II. Application to allow users to assess associated risk of various guarantee levels

The guarantee deliverable (application) is built upon the statistical foundation discussed in the above section. The overall goal of the guarantee tool is to provide the buyers and sellers of print with a system to help determine the number of gross ad impressions that would be guaranteed over the course of a particular ad campaign and to inform the buy/sell negotiations. This guarantee is analogous to that given by publishing companies using circulation, but moves the commitment to a more ROI accountable metric. In addition to establishing a guaranteed number of ad impressions, the system informs the user of the risk incurred with an associated numerical guarantee. For example, a publisher might want to guarantee "x" number of gross ad impressions over the course of a campaign that includes a specified number of failure with the guarantee. Users can then work within the system to assess the associated changes in risk and reward with different gross ad impression levels.

At the first stage of creating the guarantee (see Figure 1), the user selects a list of magazines from the available publications measured in all three GfK MRI audience studies (i.e., the National Survey of the American Consumer Study, the Issue Specific Study and the Starch Ad Measures Study). Users can create proprietary lists of competitive sets or a publisher's group of magazines that will be included in the overall guarantee.

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Figure 1

The next stage in the process (see Figure 2) enables the user to select the time frame of historical data that will be part of the guarantee calculation. Since data are available from 2008 onward for most of the publications that are measured, users have the flexibility of basing their guarantee on the most recent set of data or on a longer period of time with many more instances of measured ads.

Figure 2

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At the third stage (see Figure 3), the user searches for the most appropriate set of ads that will serve as the statistical basis for developing the guarantee. If the campaign is specifically about a particular advertiser or advertising category, options are available to restrict the historical data to only those ads that reflect the upcoming ad campaign. The system provides a warning if there are too few historical examples for establishing guarantees, thereby informing the user to revise his selection of past performing ads to include a broader ad category. Users have the option (see Figure 4) of selecting the type or size of ads (e.g., one-page, four color) that will reflect the type of ads to be used in the upcoming campaign.

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Figure 3

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Figure 4



The final stage of the guarantee system (see Figure 5) affords the user two options:

- enter the level of risk the publisher is willing to incur for the guarantee and then returns the number of gross ad impressions consistent with that risk or
- enter the number of gross ad impressions the publisher is willing to guarantee for the ad campaign and returns the level of risk associated with that number

In either of these cases, the user enters the number of insertions for each magazine, respectively, in the upcoming ad campaign. The system also enables the user to vary the number of insertions and assess the corresponding change in guaranteed gross ad impressions.

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Figure 5													
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III. Empirical Validation of Assumptions, Distributions and Predicted Results

As is the case with any theoretical developments, the translation of theory into a practical application involves the satisfaction of certain assumptions. In order to test the degree to which these assumptions are satisfied and the degree with which the actual results agree with the predicted results we have conducted a number of simulations involving actual noting audiences as measured by the GfK MRI ad measure system.

We have examined three distributions, all assumed to be Normal with calculable means and variances, by the theory. These distributions are;

- a) The distribution of a noting audience for a single ad in a single issue
- b) The distributions of the sum of noting audiences in ads across multiple issues of the same magazine title.
- c) The distribution of the sum of noting audiences across multiple ads in multiple issues of different titles.

In order to examine validity of these assumptions, we examined the ad noting audience levels for selected categories in 7 titles: Allure, Better Homes and Gardens, Conde Nast Traveler, Glamour, Lucky, Time and Vogue. We restricted the ad categories as follows: (Time-Automotive, Conde Nast Traveler-Hotels & Resorts and Transportation, All other Titles-Cosmetics and Beauty Aids). This represented more than 3,000 specific issue-ad pairs.

To examine the degree to which the audience levels for single ads followed the normal distribution we graphed (using histograms) the actual ad noting score (audience levels) with the normal curve superimposed. Two of these histograms appear directly below and the other five are included in the appendix.



Figure 6 - Distribution of Ad Noting Scores Glamour





These histograms (Figures 6 and 7) and the other five in the appendix indicate that the noting scores are not perfectly consistent with the Normal distribution but that the departures from normality are not severe. However, they do indicate that the use of the normal distribution to produce statements of risk for guarantees based on single ads in single issues should be viewed as approximations.

We then examined the behavior of multiple ads across multiple issues of the same magazine and found a very strong conformation for the assumption of normality. We selected 50,000 replications, each consisting of a random sample of 5 ads from a title. We then produced histograms showing the gross ad noting audience across the 5 ads. The normal distribution was superimposed on these histograms. Two of these histograms appear directly below and the other five are included in the appendix.



Figure 8 - Distribution of the Sum of 5 Noting Audience Levels Lucky





Our conclusion from examining these histograms (Figures 8 and 9), as well as the theoretical and actual frequency distributions, is that the normality assumption is strongly supported and the resulting probabilities derived from the normal distribution will provide valid estimates of risk.

Finally we examined the distributions of the sum of noting audiences across multiple ads in multiple issues of different titles. This was done by selecting 50,000 replicated samples of various numbers of ads from the two groups of titles described above. We found that in all cases examined the assumption of normality was strongly supported. We describe two of these typical simulations below.

Simulation 1 consisted of 50,000 repeated selections of 3 ads from Allure, 5 from Glamour, 4 from Lucky and 2 from Vogue. The distribution of gross noting impressions is shown in the graph below. The normal distribution function is shown by the superimposed curve.



Figure 10 - Distribution of the Sum Multiple Ads Different Magazines same Category

As is clear from this graph, as well as the resulting theoretical and actual frequency counts, the assumption of normality is strongly supported. In this case we selected ads from the same category, Beauty and Cosmetic Aids. In order to examine the distribution of multiple ads in multiple magazines with different categories, we also carried out a number of simulations with different titles and categories. For example, we carried out 50,000 replications which selected 3 ads from Time, 5 from Conde Nast Traveler and 4 from Better Homes and Gardens. The Frequency Histogram with superimposed normal curve is shown below in Figure 11. As may be seen, the assumption of normality is well supported even when both titles and categories are quite different. Again we find that the assessment of risk based on a normal distribution is strongly justified.

Figure 11 – Distribution of the Sum Multiple Ads Different Magazines different Categories



Ads Time(3) CNT(5) BHG(4)

IV. Further Issues and Planned Research

In order to improve the ultimate utility of this guarantee system, we have already introduced a number of enhancements to the deliverable discussed above. The user is now capable of assessing risk for guarantees using issue-specific audiences and "actions taken as a result of seeing an ad" projections, respectively. These changes enable buyers and sellers to shift the guarantee metric to different levels in the purchasing funnel.

There are, however, a number of issues that require additional options or warrant further research. For example, we want to provide the buyer or seller with the ability to track the performance of ads during the campaign and to continuously evaluate whether the campaign is performing as expected based on the initial guarantee. This tracking system should assist sellers to adjust placement of later ads in the campaign (if there is sufficient time) or consider alternative platforms (e.g., web sites or digital platforms) to make good for a possible shortfall. We also are exploring a statistical adjustment or factor that accounts for observed trends in a magazine's recent audience performance. This feature may be useful under certain circumstances since the analytical system makes use of historical data over a longer period of time. We are also conducting research on using ad noting performance(s) for surrogate magazines when a magazine has insufficient data or no history of ad noting audiences for a particular advertiser or advertising category. The complexities of applying observed variances and

noting levels from one set of magazines to another magazine in a competitive set to establish guarantees requires substantial statistical analysis and testing of the derived system.

The transition from negotiating guarantees on magazine circulation to issue-specific ad noting audiences is likely to be an ongoing process. If the proponents of this currency shift are correct, buyers and sellers will need a system that is understandable, informative and reliable. We hope that our guarantee tool meets these criteria.

We also note that as the system develops we may wish to add components that allow for the control of "risks" associated with over-delivery. This ability to assess both the high and low ranges in variation is often incorporated in financial product and derivative risk assessment.

References:

Hanrahan, Jack. "Magazine Circulation Guarantees: The Basics." *Circ Matters* Volume 4 Number 6: 2

Ives, Nat. "Marketers to Mags: Give Guarantees or We'll Walk." May 7, 2007 http://adage.com/article/mediaworks/marketers-magsgive-guarantees-walk

Ives, Nat. "Time Inc. Expands Ad Performance Guarantees Helping Magazines' Push for Audience Recognition." May 19, 2011 http://adage.com/article/mediaworks/time-expands-performance-guarantee-advertiser

Kliger, Jack. Speech at DMA Circulation Day 2008. February 12, 2008 http://www.magazine.org/AsSSOCIATION/PRESS/SPEECHES/26101.aspx

Moses, Lucia: "Papers Pushed on Numbers." November 28, 2010 http://www.adweek.com/news/press/papers-pushed-numbers

APPENDIX A SINGLE AD DISTRIBUTIONS



Figure 12 – Distribution of gross noting audience of 1 ad - Allure



Figure 13 –Distribution of gross noting audience of 1 ad – Better Homes & Gardens



Figure 14 –Distribution of gross noting audience of 1 ad – Conde Nast Traveler



Figure 15 –Distribution of gross noting audience of 1 ad – Lucky



Figure 16 – Distribution of gross noting audience of 1 ad – Vogue

APPENDIX B – DISTRIBUTION OF THE GROSS AUDIENCE OF 5 ADS SINGLE MAGAZINE



Figure 17 – Distribution of the cumulative ad noting audience of 5 ads - Allure



Figure 18 - Distribution of the cumulative ad noting audience of 5 ads - Better Homes and Gardens



Figure 19 - Distribution of the cumulative ad noting audience of 5 ads - Conde Nast Traveler







Figure 21 – Distribution of the cumulative ad noting audience of 5 ads - Time