

MediaScan: New dimensions in the technical measurement of traditional print media for planning

by

Dr Michael Halleemann, Gruner + Jahr GmbH & Co. KG
Gabriele Ritter, Media-Micro-Census GmbH

1. Initial situation and background

The publication of figures for advertisement exposure opportunities based on MediaScan data in ma Press Media 2015 I marks the day-to-day implementation of a multi-year research project at ag.ma. Work on this project got underway some years ago with a comprehensive review of innovative techniques in print research. One particular goal was to be able to offer an extension to planning data for printed media, to enable the presentation of historical reach growth/exposure growth and multiple issue usage, as well as read duration and read time. Following the consideration and evaluation of a wide variety of survey models, it was concluded that detailed planning data would be obtained only by combining several discrete methods. No single model offered the option of presenting both reach data and the required metadata so to improve on the copy tests typically used to date in representing out-of-home read data (for example). And, as regards integrating technical survey data with a multi-pillar model, there was also strong interest in extending this option to print. MediaScan was the tool chosen.

2. Objectives and Methodology

MediaScan pursued two primary goals:

- The data collected by MediaScan measurement is to be used to report on additional time-based performance parameters for ma Print (newspapers and magazines). These performance values include multiple exposures, reach extension over time und page exposures.
- The previous method to determine ad exposure probabilities, based on copy tests, will be replaced by measurement.

Methodology:

With the MediaScan approach, participants selected by a quota system first complete a slightly shortened version of the ma Press Media interview before then documenting their time-based usage of magazines and daily papers with scanners over a two-week period. Data collected here include the publication, issue, read volume, read duration and read times. It is important to note that the reach survey performed (using a random route method) by ma Press Media on the basis of the "recent reading" model continues to be carried out as before (39,000 cases/year). MediaScan participants are also recruited using a quota system in a separate study. Before the MediaScan device is issued, a 30-minute CASI interview is conducted in which the typical readership questions about time filters and frequency are supplemented by extra questions on reading locations, usage time of day, number of pickups and read volume. The MediaScan device is then issued and training is given, using prepared scenarios and examples. The scan period lasts two weeks. After the test period, the interviewer collects the scan device.

Later, data modelling is used to correlate the data from the MediaScan participants with reach survey data. This method retains the media exposure metric in the established manner while simultaneously supplementing it with extra time-based metadata.

Alongside barcode-based input, we also deploy a diary for entering missing or forgotten scans. Participants are asked to update their diary every evening. Our experiments have shown that this is necessary, since there are always situations in which people do not scan. And there is a tendency for "under-reporting" anyway.

Alongside the goal

- a) of collecting additional, print-specific performance parameters
- b) the core objective for introducing MediaScan was to revise advertisement exposure data collection. With MediaScan, this is performed as follows:

The number of pages read is queried immediately after each read session. Immediately after a read session, the respondent marks the end by pressing a button on the scanner. A scale is then shown on the display with four reading amount categories:

- (almost) all
- $\frac{1}{4}$ - $\frac{3}{4}$
- $\frac{1}{4}$
- Only a few

This information is then used later to calculate advertisement reach.

That the scale has only four steps is attributable more to limited scanner display real estate than research design.

MediaScan thus ensures data is not forgotten, since it enables the proportion of page-turns to be logged per publication after each read session, whether at-home or out-of-home. Sample sizes also require aggregation for similar titles until the sample size for more and more publications increases to a level where per-publication page exposure data is available.

3. Testing and the search for the right scanner

The development and optimisation of the scan method involved the completion of various experiments requiring the mastery of a series of both technical and methodological challenges.

Key results from testing were as follows:

- Method test (2008)

Completion of the test was intended to provide initial experience with scanner handling and the scan data obtained. Half of the survey respondents also received a diary they were asked to update.

Result:

The verdict from participants was generally positive, although many found having to remember to perform the scan tedious. It was also decided to limit the double workload for survey respondents with diaries to the entry of scan omissions only. More scans were completed in the first week than in the second week. Initial approaches to data modelling – relevant for integration into the ma dataset – returned some promising results.

- Scanner handling test (2009)

One question that arose during the MediaScan work was whether it would be possible for page usage logging to take place "live" while using the issues, by deploying the MediaScan device. Questioning respondents on the number of pages read directly after reading the magazine or daily paper would have advantages in terms of the respondent's capacity to recall session details. And so the idea was conceived of combining the MediaScan method with a read volume scale. This now required the deployment of scanners with a display, however, so the necessary survey questions could be shown to the user. Two types of scanner were deployed, each very different in terms of weight and size.



Result:

Overall, the device test was less than satisfactory and was cancelled after the first wave. One type of scanner was attractively compact and user-friendly but didn't work reliably with the software version installed. The battery drained rapidly during the test period, which resulted in data loss and resets to the device clock. While the second scanner model worked reliably, users found it relatively large and cumbersome, and were reluctant to take it with them to log out-of-home usage. One positive result was the proof of concept for using barcode scanners with a display, promising success once hardware and software issues had been resolved.

- First real-world test (2010/2011)

The first real-world test involved using the smaller display-based scanner model (now with updated software) to log page usage during a two- to four-week scanning test period.

Results:

The battery problems had been largely resolved. Results from the read volume scale were very positive. Data distribution was plausible in comparison to read duration. Cases of users forgetting to scan mostly occurred during out-of-home use.

While only occasional use was made of the logbook provided for entering forgotten scans, it had the effect of improving discipline and was therefore retained as a study tool. As scan rates declined over longer survey periods, the decision was made to measure readership patterns over no more than two weeks. At the start of Week 2, respondents were reminded to keep entering scans.

- Optimisation work (2010/2011)

A period of optimisation followed in 2010 and 2011. The main problem was that the multiple exposures logged by MediaScan were not as numerous as other external surveys suggested they should have been. From follow-up interviews with test subjects, it was concluded that some read sessions – involving TV listings magazines and daily papers in particular – had not been scanned. One consequence of the incomplete logging in this area was to improve participant instructions and illustrate them with case studies.

Despite precise instructions and raising test participant awareness, however, it was also recognised that motivating respondents to scan each and every read session would be an effectively impossible goal. Brief multiple exposures – such as a quick look at the TV listings or flicking through a magazine at the newspaper stand, for example – are prime candidates for patchy read session logging. Accordingly, we have to accept a certain amount of under-reporting. Alongside economic and methodological reasons (random sampling), this is also one of the primary reasons why MediaScan is not itself suited to logging readers per issue. At least not without making major concessions regarding the comprehensiveness and representativeness of the survey.

- Real-world MediaScan test parallel to ma 2013 Press, 2nd wave

Once successful results had been obtained from all of the experiments and evaluations, one final test was performed in parallel to the ma Press Media survey. For this test, 1,200 test subjects were equipped with scanners to trial the required survey data models against a larger sample size.

By this time, a scanner model had also been selected that offered the necessary ruggedness and reliability in a compact form factor. The scanner was a Zebex Z-1160, measuring just 6.99 cm x 4.44 cm x 2.33 cm.

Scan apps on smartphones had also been trialled but results had been unsatisfactory to date. Phone camera quality varied widely, with typical problems resulting from poor lighting conditions, scanning high-gloss papers and situations where it was impossible to keep the EAN code absolutely motionless – such as when reading on the bus or train, etc. Improvements have been seen in the meantime, however, both in terms of the library and in terms of phone technology. A scan app on a phone owned by the test subject is therefore an option for the future and is now being actively researched.



Results:

Overall results for the parallel test were positive and regular deployment – with ma 2014/2015 – could now begin.

4. Advertisement exposures: calibration, allocation and modelling

- Calibration

As regards the read volume scale, it had been known since advertisement exposure work began that skew is a problem with estimates made by survey respondents: regular page readers tend to overestimate their page exposures towards "all" while occasional page readers tend towards "very few". It was therefore possible to assume that something comparable to the Beike Regression Model¹ – originally developed to calibrate the read volumes determined using copy tests – would also have to be applied to the read volume² queried by the display-based scanners (requested as a four-level scale after each read session).

Investigation

To provide a basis for later calibration of the scale, an observational study was conducted in which test subjects' usage of daily papers and magazines was recorded per double-page spread using (over-the-shoulder) video recording. The same test subjects used the scanner to log the read session and read volume.

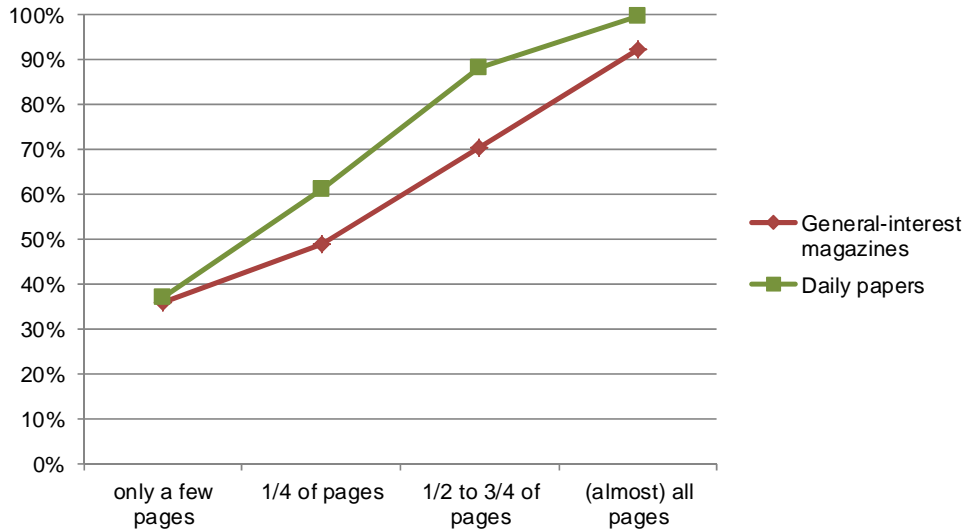
In studio tests conducted at various locations, survey respondents were provided with the current issue of a publication that they read at least occasionally. Two groups were formed for these tests: one group completed longer read sessions that were not time-limited and a second group featured shorter read sessions, where reading was interrupted by the interviewer at intervals of 5, 10 or 20 minutes. A total of 18 issues of 16 magazines and 15 issues of 11 daily papers were investigated with a total of 570 test subjects.

¹ A regression model developed in 1992 by Peter Beike for anchoring the page usage surveyed by copy tests to the actual page usage (as determined via one-off observational studies) – which is required in order to report average advertising page readership (AAPR = advertisement exposure). Further details: Peter Beike, "Identifying print media potential advertisement exposure in the ma 92 press dataset" (in German), agma research report, 1992.

² (Almost) all pages, 50% to 75% of all pages, 25% of all pages, only a few pages

As has been expected, results showed that the two lower read volume categories were underestimated, while the upper categories were overestimated (see figure 1).

Figure 1: Estimated read volume vs. the proportion of double-page spreads actually read



Choice of regression model:

The data from the observational study was utilised to construct discrete regression models for daily papers and magazines to enable estimates to be made of the proportion of pages actually read.

Predictors for the non-linear regression model for magazines included the four-level read volume scale, read duration in minutes and issue page count. For the daily paper regression model (also non-linear), the read volume scale and the read duration were also found to be significant predictors. Differentiation by paper type (national subscription paper, regional subscription paper, over the counter paper) was also a significant variable for predicting actual page usage.

Finally, the two regression models identified for estimating the actual proportion of pages per read activity also needed to be restricted to the consumption of advertising pages. Accordingly, multiple definitions of "advertising page" – variously describing a single or double page with varying (minimum) proportions of advertising space – were compared in terms of the total proportion of pages read that was recorded for each definition. When compared together, the various definitions produced similar results. Namely: the usage level for advertising pages was slightly higher than for all pages. This was a new finding and of particular interest for print media. It can be attributed to the tendency for ads to be placed in particularly eye-catching and heavily-used environments. One must also bear in mind that we are not considering the degree with which readers relate to an advertisement or any particular quality of usage as such, but solely the possibility of viewing an advertisement on a double-page spread. As a final note, it is also almost impossible to view a double page with ad space without making at least peripheral eye contact with the adverts.

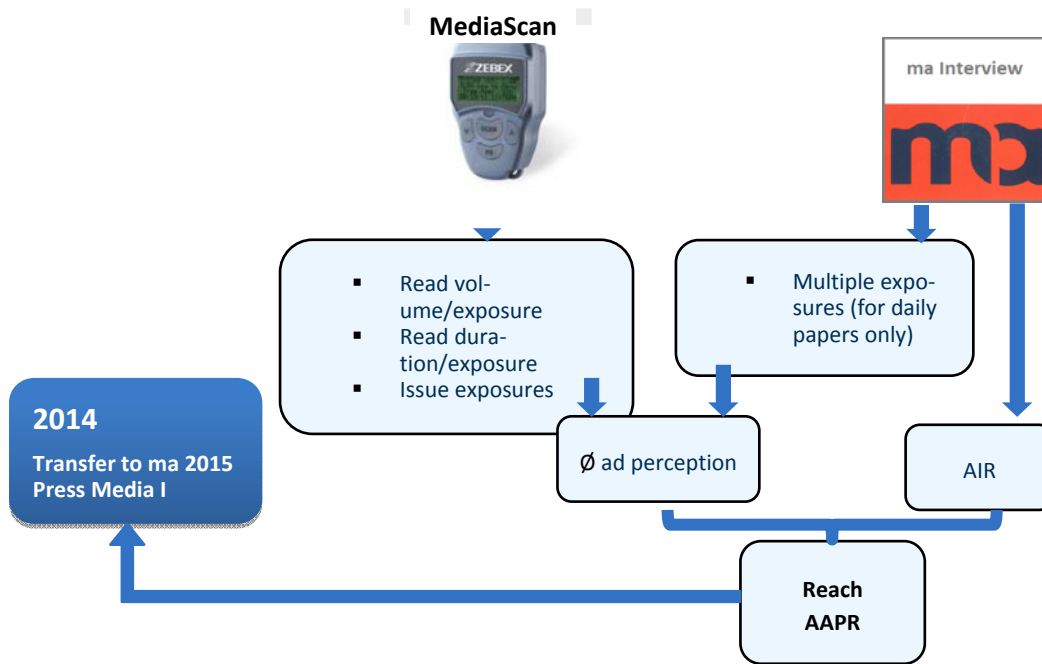
The proportion of advertising space per double-page spread definition was adopted, since its reasonable weighting of double page vs. ad space represents the most stringent definition. In accordance with the definition chosen, the two regression models for magazines and daily papers were then adjusted to accommodate a ratio of advertising page page-turns to all advertising pages. The variance identified for the final regression models amounted to 51.2% for the magazines and 47.9% for the daily papers.

- **Allocation and modelling**

The final MediaScan model now has a format where magazines can generate the average level of ad perception by collecting the issue exposures and read volume per exposure.

For daily papers, the calculation combines data on multiple usage from the media analysis with the scanned-in data, since multiple exposures for daily papers as recorded by MediaScan collection are consistently below the level actually expected. One reason for this is that papers are "taken apart" and the part read then offers no barcode to be scanned. Accordingly, the media analysis includes a survey question on "Picked up yesterday" and these queried exposures are then included in the calculation of read volume. For magazines, only the scan data are used.

Combined with the AIR, the average level of ad perception then gives us the reach for average advertising page readership.



5. The new performance values

From this year onwards, both the familiar and new performance values can now be provided for media planning. Accordingly, there are performance values that do and do not factor in multiple exposures – namely for multiple exposures with issues (AIE) and multiple exposures with advertising pages. Reach extension or the building up of reach over time is a new option for plan evaluations

	Excluding multiple per-issue and per-page exposures	Including multiple per-issue and per-page exposures
Media reach	Unchanged AIR	New AIE (average issue exposure) and pickups*
Advertisement reach	Recalculated via MediaScan AAPR	New AAPE (average advertising page exposures)
Reach extension over time for plan evaluation	New**	New**

6. Modelling

To produce the new performance values, a number of fairly demanding mathematical operations need to be performed, whose explanation would exceed the scope of this paper.³ For magazines with a longer lifecycle in the reader market in particular, adjustments needed to be made to the random scan/usage period as well as the publication interval. Effectively, scanning periods needed to be supplemented and extended. To this end, the "intercept theorem" and a modification of the chain ladder method (CLM) familiar from actuarial theory were utilised.

For transferring the supplementary performance values, microfusions were selected whereby read frequency represented the decisive anchor. In the case of page exposures, the results offer no new insights in particular. A probability factor that is multiplied with the issue usage probability will be replaced by a recalculated factor. In principle, this also applies in the case of multiple page exposures.

³ All modelling work was completed by ISBA (Hamburg) and, in the case of daily papers, by ANKORDATA (Frankfurt).

Integration of historical reach extension data is truly new, however. While reports had indeed been published earlier by Axel Springer on the basis of diary studies, and the corresponding curves could be utilised in the planning programme, data collection was performed a very long time ago and the dataset was comparatively weak. It was now possible to update these results with the new MediaScan data. Entirely new modelling work was also performed, however. For magazines, the planning data now contain usage probabilities for each of the first 50 days following the date of publication. These data can be used as per-issue/-page exposures or as multiple page exposures in plan evaluation work. It probably goes without saying that this feature is of interest only to magazines and not to daily papers.

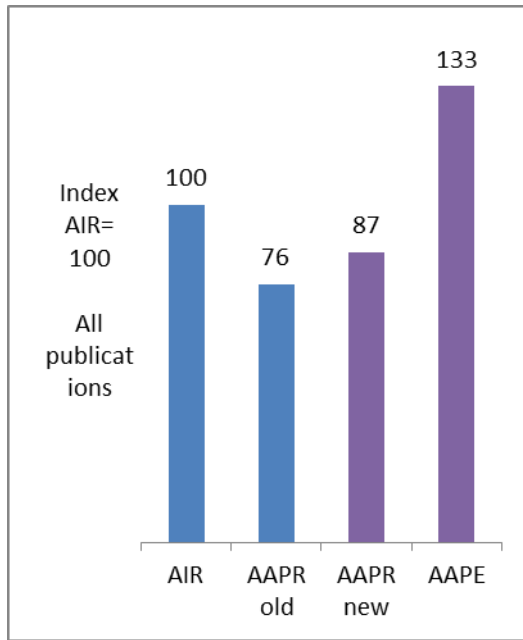
7. AAPR results with old/new comparison

Previously, it was assumed that the new advertisement exposure via MediaScan could actually be lower on average than before. In fact, the new performance value for magazines actually rose by 14% to 87% of AIR.

For the first time ever, we can now include multiple page exposures: if we do so, an index of 133 is achieved, i.e. an issue booking actually delivers around 1.4 advertisement exposures.

In contrast to daily papers, magazines will initially forego reporting on multiple average issue exposure (AIE) and will limit themselves to advertisement-relevant exposures with advertising pages. This stems from the underreporting of brief orientation exposures resulting from scanning. This affects TV listings magazines in particular, where some of the brief dips into the listings section go unrecorded.

Figure 2: Magazines old/new performance value ad exposure (AAPR)
Source: General Interest Magazines 2013, ma 2012 II, MediaScan N = 875 cases

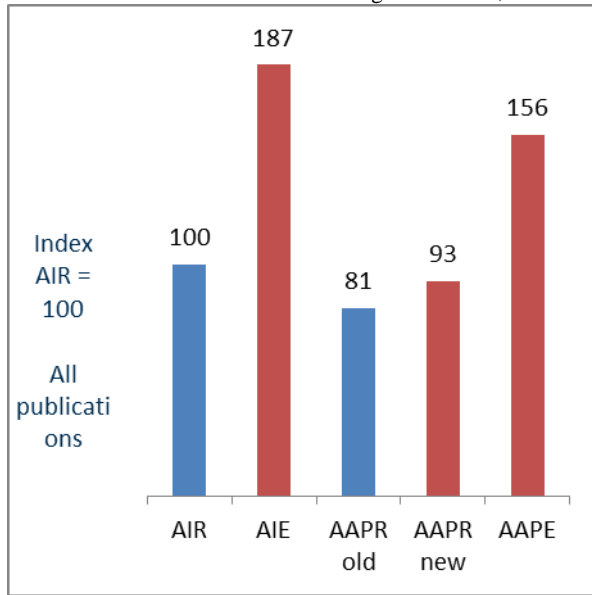


Initially published only for daily papers, the value for multiple average issue exposure shows that a reader picks up a daily paper 1.87x on average.

Gross results on advertisement exposures for daily papers are similar to those found for magazines: we see the value rising from 81% to 93% of AIR.

At the gross level, i.e. once multiple page exposures are factored in, an index of 156 is achieved, i.e. an issue booking actually delivers around 1.56 advertisement exposures.

Figure 3: Daily newspapers old/new performance value ad exposure (AAPR)
 Source: General Interest Magazines 2013, ma 2012 II, MediaScan N = 875 cases



8. Historical reach extension results with planning example

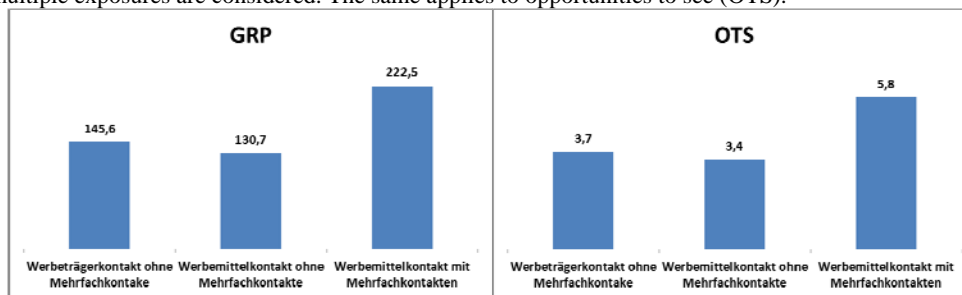
To illustrate the historical reach extension, we have calculated an – admittedly very schematic – example of a media plan. Here, we simply reserve space six times in parallel in the three weekly news periodicals Stern, Spiegel and Focus.

Figure 4: media plan
 German speaking population aged 14+
 Potential: 100%, 38.264 cases, 69.24 mio.
 2015er Preise 3 Aug. 2015 – net
 Plan1: 18 of 18 placements – EUR 1.035.346
 EVT = insertion date

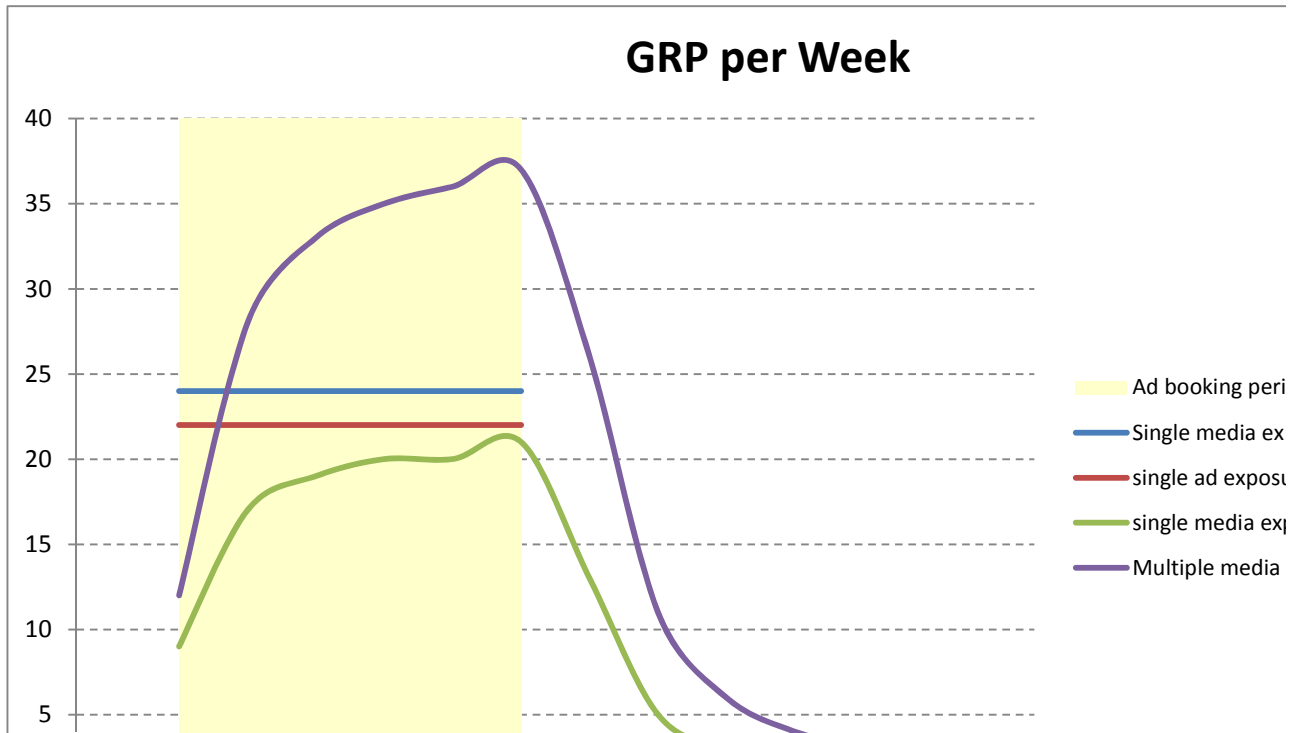
ma 2015 Presse II										
Deutschspr. Bevölkerung ab 14 Jahre										
Potenzial: 100.0 %, 38264 Fälle, 69.24 Mio.										
2015er Preise 3.8.2015 - Netto										
Plan 1: 18 von 18 Schaltungen - 1.035.346 Euro										
E			Okt 2015				Nov 2015			
V	GRP	Freq.	41	42	43	44	45	46	47	48
T			5.- 11.	12.- 18.	19.- 25.	26.- 1.	2.- 8.	9.- 15.	16.- 22.	23.- 29.
3 stern	14	6/6		X	X	X	X	X	X	X
5 DER SPIEGEL	14	6/6		X	X	X	X	X	X	X
5 FOCUS	9	6/6		X	X	X	X	X	X	X

The net reach of this plan in the overall population is 39.3% media exposure in terms of advertising media and 38.2% in terms of advertisements. As a result of duplication effects, probabilities for advertising media and advertisement exposure converge in proportion to ad space reservation.

More significant differences are naturally seen with the GRPs. A sharp increase is seen in this gross reach – particularly if multiple exposures are considered. The same applies to opportunities to see (OTS).



A look at the historical reach extension data is also rewarding. Without MediaScan findings, the exposures are distributed evenly over the ad placement period: two parallel, insipid lines for advertising media and advertisement exposure. Yet if we factor in the reach extension curves obtained by MediaScan measurements, we get a very different picture.



Now we see that gross reach extends rapidly within the first two weeks but achieves its highest level only at the end of the ad placement period. Afterwards, reach falls off sharply. That having been said: while the ad placement period ends in the third week of November, the last exposures to this plan occur in January of the following year.

9. MediaScan: outlook and potential

With the introduction of the new performance values based on MediaScan, a new milestone has been achieved by print research in Germany. For the first time, the average issue readership survey method is now augmented by technical data collection to render it comparable with the push-button surveys typically used in TV. Logging read volume directly after the read session in question promises to yield more accurate values than the copy tests previously used.

It must be said that the introduction of the new performance values was accompanied by little fanfare, however. It also remains to be seen whether agencies will make changes to their routine planning. In this era of real-time advertising, improvements in mapping print to the timeline may be considered less than sensational. And yet MediaScan data does open doors.

Both the multiple exposures and the chronological dimension to the development of print planning performance make print comparable in a sense to other types of ad media that deliver their exposures "hard-wired" to the timeline. The binary "exposure/no exposure" familiar to us from electronic media can now be compared to print media for a specific point in time – at least as a probability.

Alongside an improvement in resolution, this mapping also finally illustrates the strengths of print. Data for multiple exposures and for the knock-on effect of print plans beyond the actual ad placement period can now be utilised in ad effectiveness studies and as proof of the effectiveness of print.

Another application whose utilisation is already being planned by some media brands is the calculation of total audience reach figures for specific time periods. As one example, MediaScan data could be used by media brands to generate daily reach figures as calculated from a printed daily paper, the website, the app and a weekly magazine. Here, the weekly's publication frequency is effectively broken down to a daily figure. Accordingly, MediaScan developments now enable applications that had never been planned in this form before. And the introduction of mixed-mode for print surveys promises to accelerate the rate of innovation in the future.