REAL CROSS MEDIA PLANNING FOR TELEVISION AND MAGAZINES

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Introduction

The role of media research has traditionally been to provide a trading 'currency' between buyer and seller. Since the selling and buying of different media types has essentially taken place independently this has led, for both technical and political (funding) reasons, to quite different research approaches particularly between print and audio-visual media. It is popular to describe media research as taking place in 'silos' using different research techniques and measurement standards.

The media highway is changing dramatically with ever increasing media fragmentation and new media. Media owners, particularly through their Internet site links with their print or TV content now offer a cross-media audience delivery. They begin to see the commercial need for cross media data and evaluation. Advertisers increasingly demand a better assessment of their return on their cross media advertising investment. Cross media evaluation is becoming a more serious consideration for media owners (who primarily fund media research) as well advertisers and their agencies.

In consequence media research is being asked to play a role for cross media campaign planning and evaluation for which it was not designed. As an essential first step the data must allow media planners to estimate the outcome of a media plan in terms of target group message delivery (reach and distribution of OTS) day by day across the campaign time period with estimates of the contribution provided by each of the media used. Only when such a map of cross media exposure distribution is available can we start to evaluate the 'effects' of different cross media plans.

Considerable development is needed, particularly for print media data, before it will become possible to reliably build these cross media exposure maps as the concepts between print and TV research design have been quite different.

The TV and print research divide

Television audience measurement, based on in home PeopleMeter panels, provides viewing event data continuously across time. Knowing spot/campaign performance (reach and OTS frequency by time period) rapidly after transmission has been crucial in the trading of television time which places a lot of emphasis on post analysis.

Television defines (albeit with a number of nuances) its audience in terms of recorded presence in the room during the period of the screening of the advertisement. It provides therefore a measure of the advertisement audience.

Downsides are the generally small homes panel sample sizes limiting precise targeting and analysis of the increasing numbers of small special interest channels which, unlike magazines, cannot demonstrate (and therefore cannot charge for) their special interest audiences. Increasing attention will have to be given to out of home viewing with increasing reception of TV content on PC's and mobile devices.

For print fast reporting and post analysis was never an issue but detailed targeting has been. Hence periodic (1-4 times a year) large scale higher quality samples reporting on average exposure levels (AIR) have been the standard for print research. There is no concept of reading events by time of exposure as there is for TV (internet/radio/poster) viewing events.

Print defines its audience in terms of those exposed to an (average) issue of the publication and not the audience likely to be exposed to a particular advertisement within the issue. OTS definitions between print and TV are therefore quite different.

With traditional print AIR data planners can only look at the cumulated end result of a plan and ignore the element of time dispersion of the planned contacts. Although the end result of a plan might show high net reach and repetition, the weekly and daily results are often well below what would be a minimum acceptable level of ratings for TV. AIR has let to magazines often being used to cover too many weeks with too few insertions (and thus attributed too low budgets). No wonder that advertisers are often disappointed by the lack of visible return from magazine investments when the research period excludes much of the press exposure (yet to be delivered) and compares below threshold issue audience ratings with much higher above threshold TV advertisement ratings.

The nature of TV audience research and print audience research is thus completely different yet the planner needs to be able to evaluate the two media in combination. There is little doubt for this to happen that it is the print issue audience data that has to move towards event based advertising exposure data - if the print medium is not to be isolated. Data for TV, radio, Internet and poster will all be event related across time (before long).

The Belgium WAR project

The WAR project (reported at the Prague WWRS) developed a methodology to provide magazines with such event based data at the average page exposure level so that estimates of magazine exposure could be made on a day by day basis - at the advertising exposure level and including multiple reading events.

Using a two week diary respondents reported their reading events for each 'yesterday'. This included specific issue(s) of a title read, day part in which read and time spent reading in that day part and the proportion of that issue read that day. The two weeks of data were expanded mathematically to create an 'n' week dairy of reading events. A short description of the evolution of the WAR project and technical references can be found in Annex 1.

Although it takes time to change old habits, the new way of looking at results of magazine plans through the WAR project and the Sesame software is slowly altering the way magazines are planned in Belgium. Magazine planning starts to look more like TV-planning. The planner can now set and plan for weekly goals in terms of net reach, repetition and gross reach just like is done for television. The definition of a contact is also quiet similar. Both 'WAR' and 'CIM/Audimetrie' (TV PeopleMeter system in Belgium) report at the level of 'open eyes in front of an average page or presence in room at the time advertisement is screened'.

We thus have all elements in our hands to build a television plus magazines mix media planning tool. Don't we?

Integrating TV data into the event based magazine data (WAR)

A second phase of the WAR project, conducted by Sanoma Magazines in association with SPACE, one of Belgium's leading media agencies, involved expanding the event based magazine readership base to also include TV viewing. This had been planned for in the initial data collection.

The means used to achieve this Magazine and TV data integration did not rely on data 'fusion'. While fusion techniques can be useful for merging social or demographic surveys they are rather poor for merging media surveys as it is impossible to control media duplication patterns directly. Correct duplication patterns are absolutely crucial to cross media planning and evaluation.

The approach adopted can be considered to an extent as 'single source'. By adding a limited number of questions to the initial WAR print survey we established general TV viewing patterns by channel for the same respondents. This provides 'single source' *duplication patterns within TV* channels and *between print and TV* vehicles as well as approximate TV channel reach, viewing time and viewing weight levels. This data was then *modeled* (expanded) so that every respondent ended up with a 'Virtual' week diary of TV viewing behavior at the average minute level within quarter hour. In this expansion process the results are *calibrated* such that the sum of all viewing events by all respondents matches the levels of the PeopleMeter panel data (averaged over a period). This is controlled (calibrated) to match at the average minute, quarter hour, day part, day and week level within a range of population subgroups. A further modeling process expands the one week diary to 'n' weeks of viewing such that the known audience accumulation growth patterns by channel from 1-4 weeks are respected. More detail can be found in Annex 2 on the creation and validation of the Sesame Virtual Diary.

The end result is a cross media data base in which the planner can evaluate a TV schedule and expect to achieve a very similar result in terms of reach and frequency across time to that achieved using TV panel data (for an equivalent time period). However with the integrated base the planner has access to all the classification data available on the print survey enabling more detailed target groups to be analyzed for TV (as would be used in the print evaluation). Plus, and most important, the planner is able to create the exposure distribution map of press and TV combined and the contribution to this from each of the media.

We now report a number of case examples based on the combined event-based press and TV data.

The VDiary in practice

Today's FMCG (fast moving consumer goods) advertisers seem to be reluctant to embrace a plurimedia strategy: recent adspend data show that those advertisers generally use less media than the average brand on the Belgian market.

Nr of media used for brand support
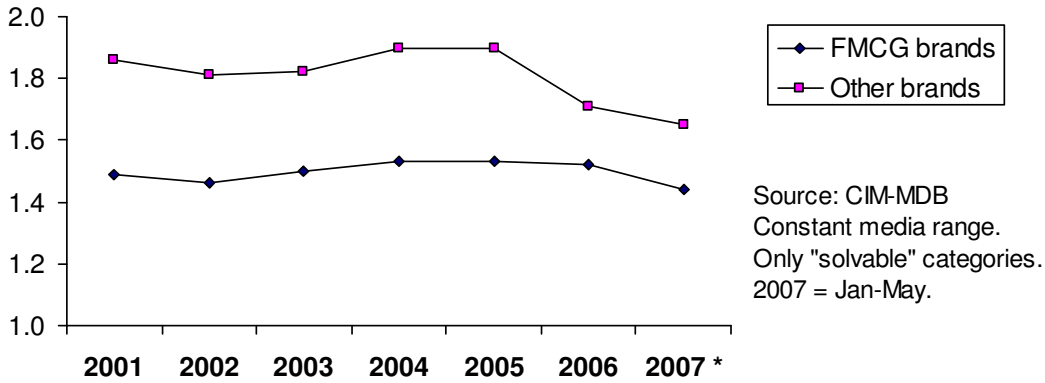
The reason for it is obvious: FMCG brands tend to use television advertising very intensively, often as a single medium, while other categories (e.g. telecoms, automotive, etc.) more often use plurimedia schedules to promote their brands. TV share of total adspend is noticeably higher among FMCG brands than the other ones.

Share of television vs total media spend
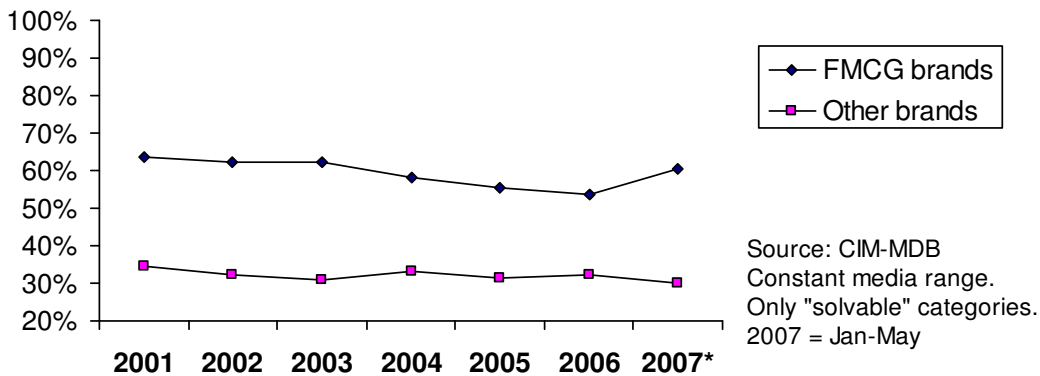
Conversely, the share of magazine's within the total media spend of FMCG brands is becoming lower and lower: from just 10% in 2001, it went down by 25% in 5 years (other categories decreased as well).

Share of magazines vs total media spend
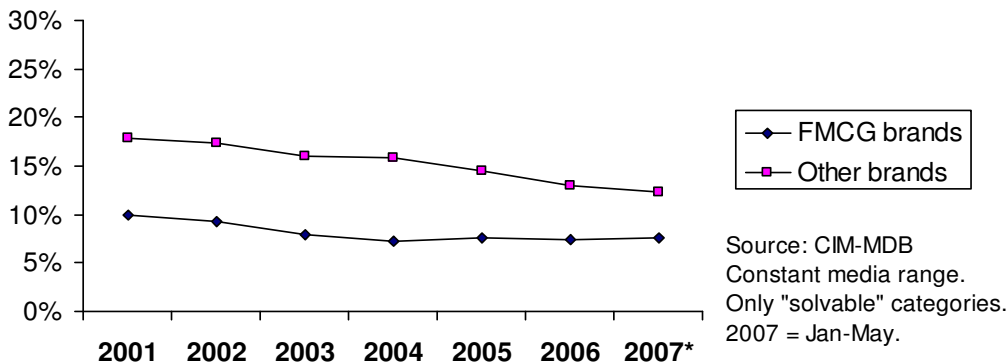
What makes magazines so difficult to sell, especially to FMCG advertisers, while the general profile of their audience (shopper, female, relatively young) theoretically fits the advertisers' requirements?

The problem comes from the currently "siloed" audience research: it is hard to demonstrate the added value of print to television in terms of reach. Even if, in Belgium, the press

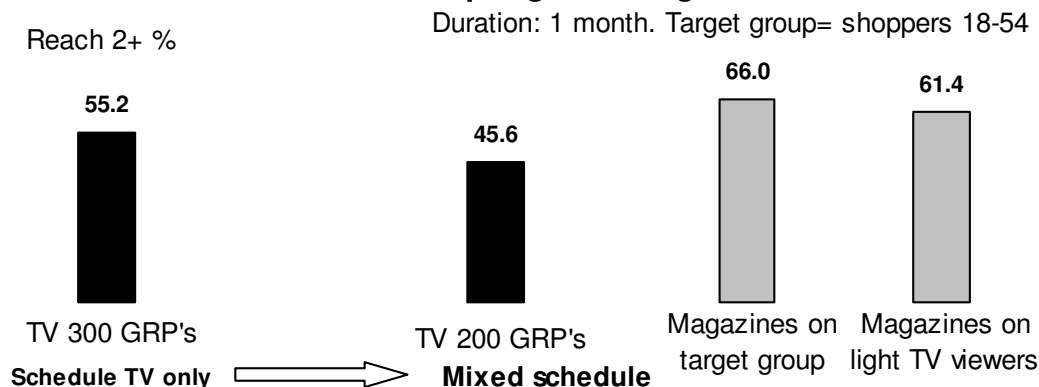**Compared performances for TV and TV+magazines
at equal gross budget**

Duration: 1 month. Target group= shoppers 18-54

Reach 2+ %

55.2 — TV 300 GRP's — Schedule TV only

45.6 — TV 200 GRP's — Mixed schedule

66.0 — Magazines on target group

61.4 — Magazines on light TV viewers

Source: CIM TV/Space estimates - CIM PMP 2003/Sesame

audience data do contain general information about the consumption of other media. So we can for instance argue that decreasing a TV campaign by 1/3rd only reduces the 2+ reach (a standard benchmark for several FMCG advertisers in Belgium) by 17%. In the meantime, that budget would build a magazine campaign with 66% reach at 2+ on the whole target group and even 61% on TV light viewers, who are not optimally reached either by the 200 GRP TV campaign or by the 300 GRP's campaign (1).

Even with that kind of demonstration, advertisers, especially from the FMCG world, are generally not persuaded, mainly for two reasons:

1. Like in many other countries, available JIC audience research (CIM in Belgium) only provides AIR figures at title level on a yearly basis: reach does not apply to seeing a given ad ("my ad" in the words of the advertiser), while television research provides with contacts at spot level. It is "assumption" of print contacts vs "actually measured" TV contacts.

2. Of course, unduplicated reach estimates are not available. It makes the reasoning less credible since based on assumptions like for instance the rough and highly questionable random duplication formula.

Once again, in the words of the advertiser, "it does not apply to my own campaign".

WAR data can now definitely help since we can provide a practical demonstration rather than just a theoretical one:

-   they provide page contacts (hence advertising contacts) estimates within specific issues: we get closer to "my campaign".

-   and of course, the V-Diary provides duplication and exclusive reach from both media, TV and magazines.

In these circumstances, the exercise above may be revisited: the V-Diary will provide the advertiser with an accurate and validated estimate of the added value of magazines while cutting 100 TV GRP's and reinvesting the budget into print.

The consequence is significant: it extends the 2+ reach by not less than 55%, for the same gross budget. Arguably a print exposure may not be considered equal to a TV exposure, but the proportion of supplementary reach is so important that one cannot consider it is worthless.

Compared performances for TV and TV+magazines at equal gross budget

Reach 2+ %   Duration: 1 month. Target group= shoppers 18-54

67.7

43.6

37.8   **41.5**

TV 300 GRP's   TV 200 GRP's   Magazines only   Magazines +TV
Schedule TV only ⟶ **Mixed schedule**

Source: Sanoma V-Diary
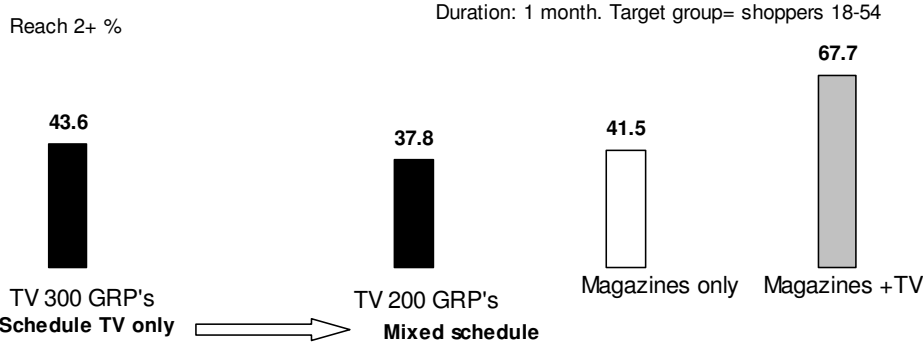
As far as the viewing weight is concerned, the addition of print expands the 2+ reach on light viewers (the ones who are less exposed to the TV campaign).

Maybe this is rather theoretical. Here are two actual case studies from the same (FMCG) advertiser, for which the use of print has been effective.

Based on Sanoma V-Diary, we could have been more balanced, and by far, more effective than it actually was. It should be emphasized that light TV viewers are important for FMCG advertisers. These viewers are generally highly educated, up-market and young. But they are also much less loyal to brands: according to the Brand Media Monitor 2006 (TNS Media Belgium), almost 16% of light TV viewers declare they are not loyal to the known A-brands, against an average of less than 11% among other viewer types (significant difference at $\alpha = 0.01$). It is therefore crucial for the brands, hence the FMCG advertisers, to effectively reach those more elusive shoppers. With a profile generally biased towards young & affluent people, magazines offer a fair complement to TV to reach them.

Case Study 1 is a campaign aired during the last 2 months of 2006. Print accounted for 10% of the total gross budget and TV for 90%.

Sanoma V-Diary and WAR data may be combined to illustrate the weekly gross and net reach of the campaign. Even if the magazine schedule was made on TV light viewers from the target group, it is obvious that the magazines contacts are not distributed evenly across weeks.

Case 1: original magazine/TV impacts

☐ Magazines net %   ■ TV net %   —×— TV gross %   —△— Magazines gross %

Weeks
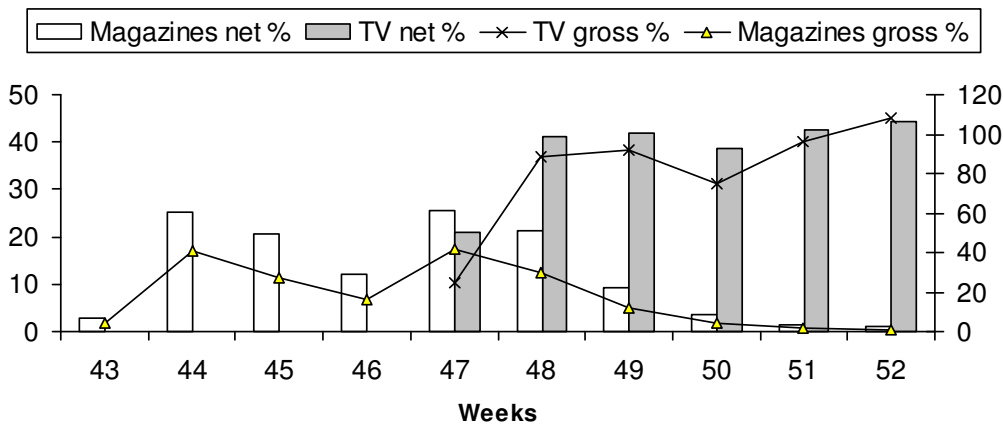
Source: Sanoma V-Diary. Target group = upmarket adults 18-54.

And yet this campaign proved to be effective: monthly tracking data show that while the brand usually was at an equal spontaneous awareness level compared to its main competitor (25.8% for the brand, 26.3% for the competitor – yearly average), the very month of the campaign, unaided awareness levels were respectively 28.3% and 25.2%. This means that TV+Magazines resulted in a bonus of 12% awareness for our brand!

Nevertheless, a better allocation was possible:

- during the last month of 2006, the dispersion of print contacts was not even
- some magazines (the monthly titles) are only used once, which is a low usage for the production cost investment.

We therefore studied a -10% budget cut for TV, with the budget reallocated to magazines. As shown in the graph below, this leads to much more continuity in contacts breakdown (TV has been somewhat rescheduled as well): extra budget enabled a second insertion in monthly titles.

This in turn must lead to a better efficiency if we refer to the well-known theories of recency planning.

Case 1: reallocated magazine/TV impacts
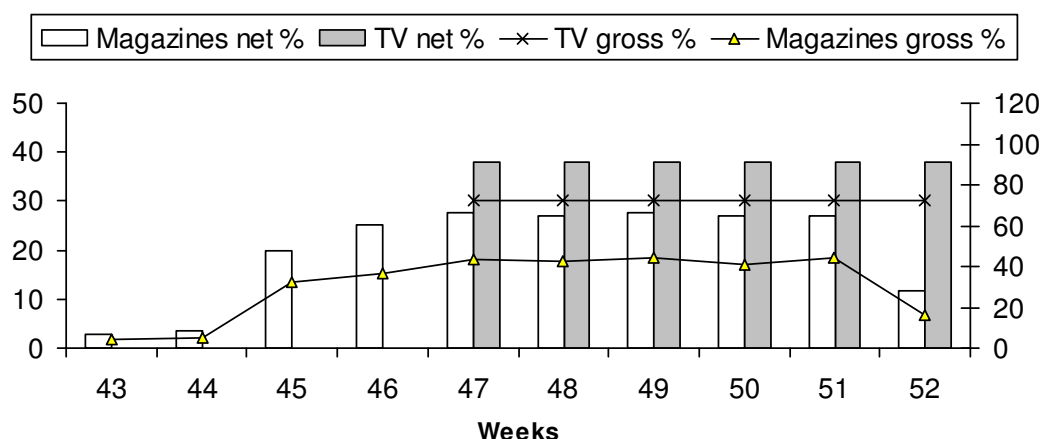
Source: Sanoma V-Diary. Target group = upmarket adults 18-54.

A comparison of schedules shows that the 10% budget cut on TV results in an overall optimization of reach, by expanding the magazines schedules accordingly. In our estimates the 10% cut on TV primarily results in a decrease on high (rather ineffective (2)) frequency levels, while the 2-6 (TV) OTS is hardly penalized.

Meanwhile, the allocation helps expand the net reach of the campaign by 5 percentage points. It also drastically increases the amount of contacts realized by magazines, which is normally not a problem (3).

Case 1	Original schedule			Reallocated			Index reallocated/original		
	TV	Print	Both	TV	Print	Both	TV	Print	Both
GRPs	485	160	645	436	311	748	90	195	116
Reach 1+ %	65.7	49.2	75.4	63.0	63.8	80.4	96	130	107
Avg OTS	7.4	3.2	8.5	6.9	4.9	9.3	94	150	109
Reach 2+ %	57.5	34.0	66.6	53.9	50.7	71.8	94	149	108
Reach 7+ %	27.4	5.4	35.7	24.7	16.1	40.6	90	298	114
Reach 2-6 %	30.1	28.6	30.8	29.2	34.6	31.1	97	121	101

Source: Sanoma V-Diary/Space estimates. Target group = adults 18-54 up-market.

In summary **Case 1** shows that within the same budget with the same title selection (up to now, we have not altered it) a more effective contact breakdown may be achieved. No doubt that the awareness data should have been even better for this case.

Notes to analysis
The V-Diary does not reproduce exactly the results we get from the analysis of our exact campaign on the CIM/Audimetrie panel data. The panel results are based on the actual spots bought not the average ratings forecast by the VDiary. In fact the differences represent a measure of the buying performance against the average. For this campaign, the evaluation coming from the panel gave a gross reach of 516 GRP's and an average frequency of 7.2 (CIM TV/Arianna- Up-market 18-54 adults) compared to 485 GRP's and 7.4 OTS from the VDiary. The simulation is therefore highly reliable.

Case Study 2 is about a co-branding between a women's magazine and an FMCG brand. From the beginning of January 2007, a special 10 second TV commercial referred to the cooperation between the brand and the magazine, while in parallel a campaign run in the magazine pages advertised the cooperation between both. Visuals of the campaign will be shown during our presentation to make the case more tangible.

The remarkable thing about this campaign is that, by means of the V-Diary, we can demonstrate that in this case, the addition of print led to a fair expansion of net reach (+10 percentage points) while the average frequency (11 OTS) remained unchanged over the considered period .

	Cumulated results		
	Jan	Feb	Mar
TV			
GRP's	276	534	783
Reach 1+ %	59.3	66.5	70.4
Avg OTS	4.7	8.0	11.1
Print			
GRP's	28	73	120
Reach 1+ %	14.9	19.9	20.4
Avg OTS	1.9	3.7	5.9
Both			
GRP's	305	607	903
Reach 1+ %	69.4	77.1	81.7
Avg OTS	4.4	7.9	11.1

Source: Sanoma V-Diary/Space estimates. Target group = women 15-34.

Notes to analysis

Once again, the V-Diary varies a little to the panel data based on actual spots used. The evaluation of this campaign led to 813 GRP's and an average frequency of 11 (CIM TV/Arianna- Women 15-34 years) compared to the VDiary at 783GRP's and 11.1 OTS.

This means that the TV campaign only partially reached readers from the magazine but helped advertise beyond this specific group of readers.

Crossing V-Diary data with the actual campaign performances helps to understand why the campaign did not specifically reach the magazine readers.

As shown in the table below, the budget allocation between channels did not entirely match the viewing habits of the magazine readers (and further, the V-Diary suggests other channels should have been used):

Channel	Gross budget breakdown		Index b/a
	% actually invested (a)	Reach % of target magazine readers * (b)	
VTM	37.5	44.7	119
KANAALTWEE	8.2	4.5	55
VT4	10.9	7.3	68
RTL-TVI	26.6	22.5	85
CLUB RTL	4.5	5.2	115
PLUG TV	1.6	2.6	158
LA1	7.7	10.3	134
LA2	1.7	2.9	164
BE TV	1.3	0.0	0

* Target = women ever read target title. In this case, was to maximize duplication
 Sources: Sanoma V-Diary for alternative budget breakdown, CIM-MDB for actuals.

Similarly V-Diary data suggest that the day-part allocation of the TV campaign should have been somewhat different to match the target group of women reading the magazine, with a sharper focus on evening slots (that would have made the TV campaign more expensive !).

| Day part | Gross budget breakdown | | Index b/a |
	% actually invested (a)	% to reach target magazine readers * (b)	
Daytime (< 17:00)	6.5	0.8	13
Access prime time (17:00-18:55)	6.6	7.2	110
Prime time (18:56-22:30)	69.6	86.9	125
Night time (22:31+)	17.3	5.1	29

Target = women ever read target title. In this case, strategy was to maximize duplication
Sources: Sanoma V-Diary for alternative budget breakdown, CIM-MDB for actuals.

Nevertheless, the campaign proved to be effective. Research conducted by Sanoma showed that the buying intention on post-test 2 (after the campaign evaluated above) was higher amongst people reached by both magazines & TV and that this parameter had grown again by 5%. The effect is opposite among those only reached by TV for whom the two successive post-tests show a decreasing trend. The people claiming to be readers of the target magazine showed the highest growth of buying intention for the advertised product with an increase of 25% compared to the first measurement. This is a clear effect of the emotional link created between the brand and the target magazine readers.

Case 2: evolution buying intention (/5)
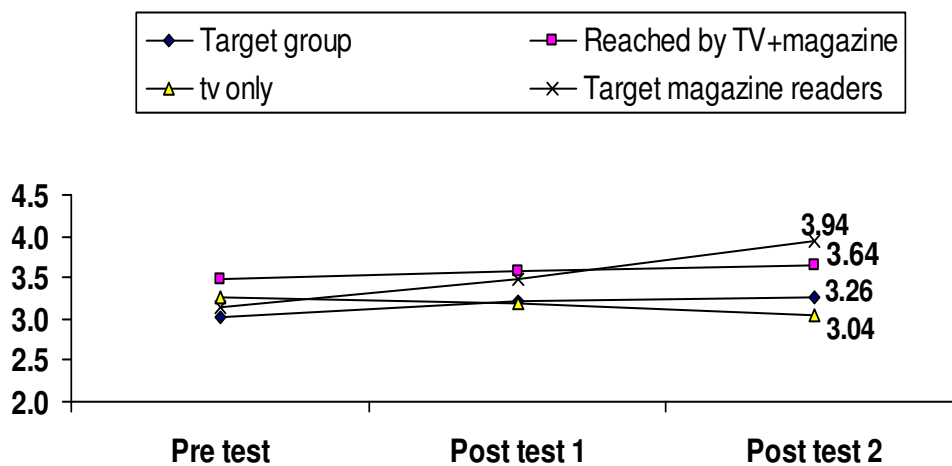
This suggests that seeking for further duplication between the TV campaign and the target magazine readers should have been a successful strategy. Unfortunately, at the time we planned this campaign, the V-Diary was not yet available.

Conclusions

These preliminary analyses, made on a tool only recently available, show that the V-Diary provides matter for improving the day-to-day work of both the planners and the (print) sales houses.

The planner gets valuable help to develop and adapt bi-media strategies, by quickly analyzing alternative allocations, not only across vehicles, but also across media, measuring the added value of both TV and magazines: no guesses, but credible and hard figures. At the time we write this paper, the simulation functionalities of the V-Diary, allowing quick "What if ?" questions are the most promising ones.

The print sales house has a state of the art argument to demonstrate that magazines are the ideal complement to TV advertising.

References

(1) Further development on the subject, dating back from December 2003 but still relevant, may be read (either in French or in Dutch) under the title "Media-mix = efficiency-mix" on http://www.space.be/spacemaker/research/2003/Dec/mediamix_FR.pdf (French version) or http://www.space.be/spacemaker/research/2003/Dec/mediamix_NL.pdf   (Dutch version).

(2) Patrick DE PELSMACKER et Joeri VAN DEN BERGH "A study of 226 TV commercials", research paper from the University of Ghent (1997). It showed that 7 OTS was the average threshold for irritation among their respondents. We therefore recommend not to go beyond this level while planning usual (not short) TV commercials.

(3) Research from Mondadori (France) suggested that saturation of magazines OTS occurs at high levels: "To reach 80% of effectiveness, saturation may be found between 7 and 17 contacts, depending on the intended objectives". Source: Nicolas COUR, Gilbert SAINT JOANIS, "EFFIPRESSE. Optimisez vos plans presse magazine grâce à de nouvelles références média planning » paper (in French) presented at the GRP Symposium in Brussels, 01/03/2007.

ANNEX 1 – The evolution of the Belgium WAR

For media where the measurement of the media exposure happens in real time (mostly television and internet, radio in some markets) the focus has shifted from media planning to post evaluation. Knowing very rapidly after transmission the target group R&F achievement has become crucial in the trading of television and internet. The measurement of print media is more complex and slow. Most print audience results are only published once or twice a year. The notion of Average Issue Readership is very 'average' compared to minute by minute TV Ratings, Unique Visitors, Page Hits, etc. In times where ROI is king, print media are lagging behind.

The measurement of specific issue reach (SIR) is an attempt to solve this commercial disadvantage for magazines (1). In practice however it is an enormous challenge to collect a sufficient number of observations for each individual edition of each individual title in the market to produce reliable readership figures for separate editions that can be split to relevant target groups. From what we have understood, the goal of the research has shifted to producing average issue readership figures based on the measurement of specific editions. The method used also allows calculation of average audience accumulation curves as was demonstrated earlier in the Belgian Time Planning experiment (2).

With the Weekly Average page Reach study (WAR) (3) we did not have the intention to improve the post buying evaluation process for magazines. Our focus was to improve media planning. We are all aware of the limitations of Average Issue Readership (AIR) measure. For media planning practice the main limitations of AIR are that: AIR gives no idea about the contact distribution over time, does not take into account repeat reading and reports contacts at the (average) issue level instead of the (average) page level.

The WAR study tackled these issues by collecting day and time of reading, duration of reading, number of reading occasions and total daily reading proportion by issue read during a specific day through specially designed two-week reading diaries. The fieldwork (2749 diaries, collected in the period of week 47/2004 till week 17/2005) was carried out by TNS Media. Long term reading diaries were created through the V-diary method by Bucknull & Masson (4). The planning software was developed by Sesame.
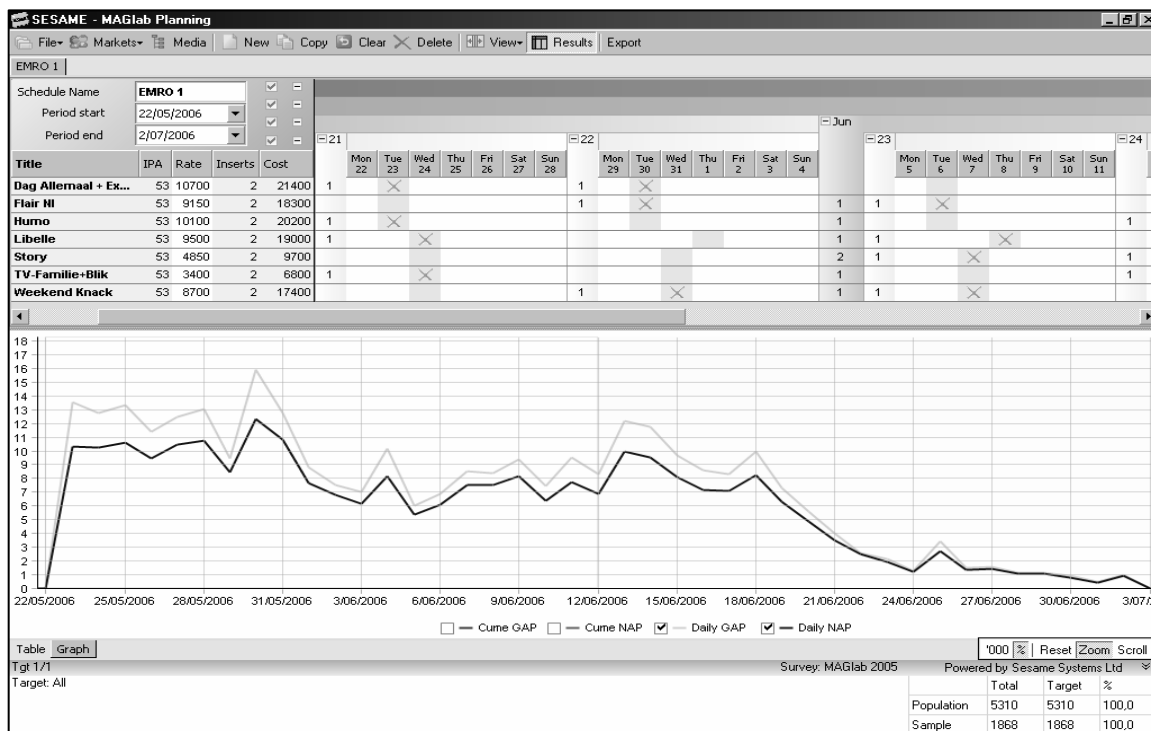
Through this planning software planners in Belgium can now visualize the day by day (or week by week) coverage (Net Average Page reach – NAP) and gross contacts (Gross Average Page reach – GAP) of a magazine plan at the average page level. Cumulated results of a plan evaluated through WAR compared to the same plan evaluated through AIR are lower in net reach, because the reach of an average page in a specific issue is reported and not the reach of an average issue, but higher in gross contacts, because the number of pick-ups of the issue during the same and across different days is taken into account.

Although it takes time to change old habits, the new way of looking at results of magazine plans is slowly altering the way magazines are planned. The mistake still often made based on traditional AIR planning tools is that planners only look at the cumulated end result of a plan (in terms of average issue reach!) and ignore the element of time dispersion of the planned contacts. Although the end result of a plan can show high net reach and repetition figures, the weekly results in many cases are well below a minimum acceptable level of 20 to 30 ratings per week. This is due to the fact that magazines are often used to

cover too many weeks with too little insertions (and thus to low budgets). No wonder that advertisers are often disappointed by the lack of visible return of their magazine investments.

Magazine planning starts to look more like TV-planning. The planner can now set and plan for weekly goals in terms of net reach, repetition and gross reach just like he does for television. The definition of a contact is also quite similar. Both 'WAR' and 'CIM/Audimetrie' (TV PeopleMeter system in Belgium) report at the level of open eyes in front of a page or a screen. We thus have all elements in our hands to build a television plus magazines mix media planning tool. The creation and validation of this tool is described in Annex 2

References

(1) Faasse, J. and van Meerem, L. (2003). *What the World needs now.* Worldwide Readership Research Symposium, 2003
(2) Peeters, S., Debeer, V. and Lanckriet, T. (1999). *Magazines Deserve Time – The Build up of Magazine Audiences Over Time*, Worldwide Readership Research Symposium 1999.
(3) Hermie, P., Lanckriet, T., Couvreur V. and Lansloot, K. (2005). *The WAR Project - A small step up the ARF media research ladder, a giant step forward in magazine planning,* Worldwide Readership Research Symposium, 2005
(4) Masson, P. and Sumner, P., (2005). *An improved Method of Collecting and Processing Readership Data,* Worldwide Readership Research Symposium, 2005

Annex 2.   Creating and validating the Virtual Diary and calibration.

The 'host' survey, in this case the Sanoma magazine diary study, contains the (event based) print media data and target group data. We want to be able to evaluate TV schedules in combination with print schedules. Included in the personal interview part of this study were certain TV viewing behavior questions. These limited questions enable us to prioritize the selection of individuals in the survey for each stage of the virtual diary creation process and not therefore have to rely on purely random processes.

Our objective is create for every informant a one week diary of their TV viewing. We want the viewing levels, when accumulated for all (weighted) informants, to yield the same reach results by average minute (Rating), quarter hour, broad day part, day and week as reported by the (CIM/Audimetrie) PeopleMeter panel (averaged over the 3 month fieldwork period of the print survey).

The PeopleMeter panel data is analyzed to provide control data, namely the (averaged) reach levels by channel by ¼ hour, 2-3 hour day part, day and week plus the average number of minutes viewed in each quarter hour by those that viewed. Depending on the panel size and the availability of common classification criteria these reach analyses are made within 15-30 population cells designed to reflect differences in TV viewing patterns. The profile of the cells within the total population should be approximately the same in both the control and host survey. Those used in this case were:

Cell Matrix		have TV in household			
		Younger (12-34)		Older (35+)	
		Social class 1-2	Social class 3-8	Social class 1-2	Social class 3-8
Main shopper	Have Children	*1*	*2*	*3*	*4*
	No Children	*5*		*6*	*7*
Non main shopper	Have Children	*8*	*9*	*10*	*11*
	No Children	12	*13*	14	*15*

In Step 1 of the VDiary creation we determine which respondents are eligible to appear in the one week diary at all for each channel (by control cell). The recency of viewing scale by channel included in the host survey allows us to select only those who claimed to view the channel in the last week. If this is higher than required from the panel control data a random selection of respondents is discarded. If the panel control data requires a higher week reach then a random selection from those making a recency claim to view the channel in the last month will be added.

Step 2 requires us to allocate those who were eligible for the diary week to each of the weekdays. The control data tell how many people (by control cell) should be allocated to each day. We know, from the recency scale claims, those who viewed yesterday and from the survey records which day was their yesterday. This allocates approximately one seventh of the sample to each day. The remaining respondents are allocated randomly to days weighted by their number of days viewing claims for the week.

Step 3 requires is us to allocate those viewers in the day to broad (2-3 hour) segments across the day. The control data tells us how many people (by control cell) should be allocated to each day part. We first allocate respondents to these day parts on the basis of their yesterday claims where their claims relate to the day in question. The remaining respondents, weighted by the hours spent viewing on an average weekend or weekend day are then randomly selected to populate each day part.

Step 4 is to allocate those in each of the day parts to quarter hours. Where the yesterday viewing claims are at the quarter hour level respondents are allocated directly to the quarters for the day that was their yesterday. The remaining viewers in the day part are allocated randomly to each quarter hour to meet the control data level.

Step 5 attributes an average number of minutes viewed in the quarter hour to each respondent allocated to the quarter. This is determined by the control data within cell. This provides the ability to calculate an average minute rating – the basis of all TV evaluation.

The accuracy of the procedure can be checked at every step by comparing the Vdiary results with the control. Examples for the Sanoma TV Vdiary are given below:

1   Weekly reach

WEEKLY			Age		Social Class		Main Shopper	
Channel		Reach%	12-35 %^	35+ %^	1-2 %^	3-8 %^	Yes %^	No %^
VT4	Control	42	41.9	42.1	42.5	41.3	22.3	42.6
	VDiary	41.5	41.1	41.7	40.9	41.7	20.9	42.3
KETNET/	Control	49.1	41.0	53.2	48.1	49.4	27.1	47.5
Canvas	VDiary	48.5	39.9	52.9	46.8	49.1	25.4	47.4
CLUB RTL	Control	25.7	23.4	26.9	21.6	27.1	14.9	23.4
	VDiary	25.4	23.1	26.5	22.4	26.6	14.0	23.4
AB3	Control	21.7	19.2	23.0	17.5	22.9	12.8	19.1
	VDiary	22	19.8	23.0	18.3	23.5	12.5	19.5

2.   Average Day

DAILY			Age		Social Class		Main Shopper	
Channel		Reach%	12-35 %^	35+ %^	1-2 %^	3-8 %^	Yes %^	No %^
VT4	Control	17.6	18.0	34.4	10.9	37.4	27.9	24.5
	VDiary	17.4	17.7	33.8	13.1	37.9	25.9	25.5
KETNET/	Control	20.5	14.7	46.5	12.6	45.4	34.7	26.5
Canvas	VDiary	20.6	14.5	46.5	15.6	45.0	32.6	28.5
CLUB RTL	Control	9.5	8.8	19.6	4.7	22.4	16.6	11.8
	VDiary	9.4	8.6	19.2	6.0	21.7	15.5	12.3
AB3	Control	8.5	6.8	18.6	3.4	20.7	15.7	9.7
	VDiary	8.7	7.3	18.4	4.6	21.1	15.2	10.5

3.   Day part

Day part			Age		Social class		Main shopper	
Av. Weekend Day		Time	12-35 %^	35+ %^	1-2 %^	3-8 %^	Yes %^	No %^
VT4	Control	0600-	0.45	0.55	0.23	0.72	0.36	0.65
	VDiary	1000	0.43	0.56	0.22	0.76	0.35	0.64
VT4	Control	1700-	2.22	3.99	1.15	4.47	3.33	2.88
	VDiary	2000	2.31	3.96	1.55	4.70	3.13	3.14
VT4	Control	2000-	3.62	8.47	2.49	8.76	6.58	5.51
	VDiary	2400	3.62	8.44	3.18	8.77	6.18	5.87

Day-part continued ..		Age		Social class		Main shopper		
Av. Weekend Day	Time	**12-35 %^**	**35+ %^**	**1-2 %^**	**3-8 %^**	**Yes %^**	**No %^**	
KETNET/	Control	0600-	0.61	1.05	0.41	1.22	0.67	0.99
Canvas	VDiary	1000	0.59	1.03	0.42	1.18	0.62	1.00
KETNET/	Control	1700-	2.41	8.32	1.85	8.42	5.65	5.08
Canvas	VDiary	2000	2.38	8.29	2.22	8.39	5.26	5.42
KETNET/	Control	2000-	2.67	10.98	3.03	9.91	8.35	5.30
Canvas	VDiary	2400	2.66	11.10	3.72	9.91	7.93	5.82
CLUB RTL	Control	0600-	0.41	0.40	0.10	0.65	0.48	0.33
	VDiary	1000	0.40	0.37	0.15	0.61	0.45	0.32
CLUB RTL	Control	1700-	1.35	1.46	0.45	2.21	1.54	1.27
	VDiary	2000	1.35	1.43	0.59	2.18	1.48	1.29
CLUB RTL	Control	2000-	1.76	4.82	1.05	5.25	4.00	2.58
	VDiary	2400	1.70	4.81	1.41	5.08	3.82	2.71
AB3	Control	0600-	0.18	0.29	0.05	0.37	0.23	0.24
	VDiary	1000	0.20	0.33	0.10	0.43	0.23	0.30
AB3	Control	1700-	0.53	1.72	0.21	1.94	1.40	0.85
	VDiary	2000	0.61	1.71	0.29	2.04	1.36	0.95
AB3	Control	2000-	1.34	3.55	0.71	3.88	3.02	1.87
	VDiary	2400	1.54	3.62	1.05	4.09	3.03	2.12

4. Quarter hour segment

quarter hour			Age		Social class		Main shopper	
Av Weekend Day			**12-35**	**35+**	**1-2**	**3-8**	**Yes**	**No**
Channel		Time	%	%	%	%	%	%
VT4	Control	0800-	0.05	0.04	0.23	0.06	0.02	0.07
	VDiary	0815	0.03	0.03	0.22	0.04	0.02	0.06
VT4	Control	1700-	0.24	0.74	1.15	0.81	0.55	0.43
	VDiary	1515	0.27	0.73	1.55	0.86	0.50	0.50
VT4	Control	2000-	0.96	1.93	2.49	2.06	1.61	1.28
	VDiary	2015	1.01	1.95	3.18	2.16	1.56	1.41
KETNET/	Control	0800-	0.11	0.27	0.41	0.29	0.15	0.23
Canvas	VDiary	0815	0.10	0.27	0.42	0.30	0.13	0.22
KETNET/	Control	1700-	0.49	2.56	1.85	2.54	1.59	1.45
Canvas	VDiary	1515	0.49	2.63	2.22	2.58	1.52	1.62
KETNET/	Control	2000-	0.62	3.06	3.03	2.74	2.22	1.46
Canvas	VDiary	2015	0.69	3.13	3.72	2.73	2.11	1.70

Quarter-hour segment continued ...			Age		Social class		Main shopper	
Av Weekend Day			12-35	35+	1-2	3-8	Yes	No
Channel		Time	%	%	%	%	%	%
CLUB RTL	Control	0800-	0.06	0.06	0.10	0.09	0.08	0.04
	VDiary	0815	0.04	0.07	0.15	0.09	0.09	0.02
CLUB RTL	Control	1700-	0.18	0.14	0.45	0.27	0.16	0.15
	VDiary	1515	0.18	0.17	0.59	0.28	0.14	0.21
CLUB RTL	Control	2000-	0.94	1.13	1.05	1.62	1.16	0.92
	VDiary	2015	0.94	1.15	1.41	1.56	1.16	0.93
AB3	Control	0800-	0.04	0.05	0.05	0.06	0.03	0.06
	VDiary	0815	0.04	0.07	0.10	0.11	0.03	0.07
AB3	Control	1700-	0.10	0.33	0.21	0.37	0.26	0.16
	VDiary	1515	0.13	0.40	0.29	0.40	0.28	0.24
AB3	Control	2000-	0.21	0.66	0.71	0.72	0.58	0.30
	VDiary	2015	0.30	0.71	1.05	0.87	0.61	0.40

The ability to match the control precisely is a function of 'host' survey sample size and survey weights. In the allocation process we can only add to a segment on the basis of 'whole' respondents. Since respondents represent many persons in the total population the building blocks of respondent*weight may be too large to meet the target population exactly. This issue becomes greater the smaller the segment that is being matched but the matches are still very close even with a small sample host survey (3000) as in this case.

Note that the VDiary uses (is) the same population structure of the host survey. To the extent that the panel survey structure varies in profile within the control cells from the host survey there may be a difference between the VDiary 'all' and the control panel 'all' since the VDiary builds its 'all' from the sum of the control cells.

5   Minutes viewed by quarter hour by those that viewed at all

Channel >	VT4		KETNET/CANVAS		CLUB RTL		AB3	
Av mins viewed Time	VDiary	control	VDiary	control	VDiary	control	VDiary	control
07:00-07:15	9.1	9.1	5.7	5.7	9.6	9.7	11.3	11.3
07:15-07:30	6.5	6.5	5.6	5.6	8.7	8.7	8.2	8.2
07:30-07:45	6.9	6.9	8	8.0	10.1	10.1	8.3	8.3
07:45-08:00	6.7	6.7	8.3	8.3	4.4	4.4	8.2	8.2
08:00-08:15	6.3	6.4	8.8	8.8	2.3	2.3	6.3	6.3
08:15-08:30	3.5	3.5	7.4	7.4	3.9	4.0	7.8	7.9
08:30-08:45	8	8.0	7.3	7.4	4	4.0	7.5	7.5
08:45-09:00	7.7	7.7	3.6	3.6	3	2.9	10.6	10.6
20:00-20:15	8	8.0	7.8	7.8	9.5	9.5	7.9	7.9
20:15-20:30	6.4	6.4	9.5	9.5	7.9	7.9	9.5	9.5
20:30-20:45	6.6	6.6	8.4	8.4	6.3	6.3	9.4	9.4
20:45-21:00	6.9	6.9	7	7.0	8.5	8.5	4.7	4.7
21:00-21:15	5.5	5.5	7.3	7.3	8.6	8.6	5.8	5.8
21:15-21:30	9.6	9.6	9.3	9.4	9.1	9.1	6	6.0

Channel > Continued...	VT4		KETNET/CANVAS		CLUB RTL		AB3	
Av mins viewed								
Time	**VDiary**	**control**	**VDiary**	**control**	**VDiary**	**control**	**VDiary**	**control**
21:30-21:45	9	9.0	8.8	8.8	9.6	9.6	5.8	5.8
21:45-22:00	9.9	9.9	8.4	8.4	9.4	9.4	5.9	5.9
22:00-22:15	10.2	10.2	7.3	7.4	9.6	9.6	6.1	6.1
22:15-22:30	7.3	7.4	7	7.0	7.9	7.9	7.4	7.4
22:30-22:45	7	7.0	5.8	5.8	6.8	6.8	6.5	6.5
22:45-23:00	7.5	7.5	6.2	6.2	6	6.0	5.8	5.8
23:00-23:15	8.8	8.9	6	6.0	6.3	6.3	6	6.1
23:15-23:30	8	8.0	8	8.0	6	6.0	6.6	6.6
23:30-23:45	7.9	8.0	6.1	6.1	5.7	5.7	7.1	7.1
23:45-24:00	10.2	10.2	8.2	8.2	6.6	6.6	5.6	5.6

Accuracy of non control variables

It is also important to assess how the integration process performs with variables that were not used in the control/calibration process. In this study the demographic and behavioral variables were limited to the primary demographics. However we can test on the media consumption (frequency of reading) since this akin to the frequency of purchase/use of any product or service.

The following table compares the frequency of reading profile for three titles for the yesterday viewers of the main Flemish TV channels. The first is the reading profile obtained on the basis of the yesterday viewing claims found in the host survey and second the average day reading profile from the VDiary. They are consistently and substantively the same reach levels and profiles. It is crucial for planning to maintain the 'single source' duplication and target group relationships between print and TV found in the host survey

Print reach and profiles	Flair NI				Story				Trends+Tendances			
	Reg	Occ.	Rarely	Any	Reg	Occ.	Rarely	Any	Reg	Occ.	Rarely	Any
All Reader prfl %	5.2	8.5	15.5	29.2	6.2	7	12.2	25.4	2.7	2.9	4	9.6
Viewers of:	%>	%>	%>	%>	%>	%>	%>	%>	%>	%>	%>	%>
Tv1												
Yesterday - recency	5.5	8.7	15.6	29.8	6.3	8.1	13.2	27.6	2.6	3.2	4	9.8
Av day - VDiary	5.4	8.6	15.7	29.7	6.3	7.6	12.7	26.6	2.8	3	4.1	9.9
Vtm												
Yesterday - recency	5.8	8.8	15.5	30.1	7	8.4	13.5	28.9	3.7	4.2	4.9	12.8
Av day - VDiary	5.4	8.6	15.1	29.1	7.8	8.6	12.2	28.6	3.4	3.7	5	12.1
Vt4												
Yesterday - recency	6.7	10.3	18	35	7.4	8.1	14.8	30.3	3.8	4.1	4.3	12.2
Av day - VDiary	6.3	10.2	17.1	33.6	6.1	8.3	13.8	28.2	3	3.2	5.2	11.4
Kanaal 2												
Yesterday - recency	7.2	10.8	15.1	33.1	8.8	7.9	12	28.7	3.3	4	4.7	12
Av day - VDiary	5.8	10.2	16.5	32.5	6.3	8.4	12.8	27.5	2.6	3.8	4.8	11.2
Vitaya												
Yesterday - recency	6	10.1	16.5	32.6	8.8	5.5	15.8	30.1	2.1	4.5	6.4	13
Av day - VDiary	6	10.4	18	34.4	7.5	8.7	13.1	29.3	2.6	4.4	4.8	11.8
Mtv NI												
Yesterday - recency	7.3	9.2	17.2	33.7	6.4	8.5	14.4	29.3	4	0.7	7.7	12.4
Av day - VDiary	6.4	10.6	16.9	33.9	6.3	9.6	12.8	28.7	5.1	2.3	4.7	12.1

A further test on the maintenance of media consumption patterns is weight of TV viewing. It can be seen in the table below that the Vdiary patterns reflect very closely the weight of viewing profiles found 'single source' in the host survey.

Weight of TV viewing	Heavy	Med Heavy	Medium	Med light	Light
Pop 000/prfl	18.3	15.7	26.1	25.2	9.4
Viewers of:	%>	%>	%>	%>	%>
Tv1					
Yesterday - recency	19.6	18.4	29.3	25.5	6.6
Av day - VDiary	19.6	17.7	29.3	25.2	7.7
Vtm					
Yesterday - recency	21.8	19.2	27.5	24.2	6.7
Av day - VDiary	22	19	29.1	22.4	7.1
Vt4					
Yesterday - recency	21.7	17.3	27.4	25.9	7.2
Av day - VDiary	20.9	17.4	29.1	25.5	6.6
Kanaal 2					
Yesterday - recency	25.3	17.1	26.4	24	6.3
Av day - VDiary	22.9	18.1	28.3	24.3	5.9
Vitaya					
Yesterday - recency	25.3	17.5	26.6	22.3	7
Av day - VDiary	23.2	16.2	28.6	23.3	8.2
Mtv Nl					
Yesterday - recency	22.8	12.9	24.6	27.4	9.9
Av day - VDiary	23.9	11.2	27.9	26.3	8.6

Duplication patterns

The Vdiary is controlled in its construction such that the reach levels will always match closely at the average minute, segment, day and week reach levels. These levels will be achieved if an 'all spots' schedule is run for the relevant period. If the period is all day Monday then to get the Monday reach requires the placement of 1440 spots (one in every minute of the day).

Normal schedules are not like this using only 1 (or a few) spots in any quarter hour and, of course, involving more than one channel.

In producing a VDiary our aim is to produce results that are close to what schedules would produce in an average week (or longer period). We do not aim to produce results that exactly match any given set of PeopleMeter results, because such results vary so widely minute to minute, day to day and week to week. This is not to doubt the value of PeopleMeter ratings as a post-hoc capture of the effect of any particular schedule, merely to point out that in forecasting we need as far as possible a reliable **average** measure. This is what a VDiary provides.

Below we show typical samples of schedules run using Sesame (VDiary) software and the Belgium CIM/AudiMetrie panel. The panel results are the average of about 20 random (in spot times) schedules using a selection of weeks within the period from which the VDiary control statistics were created. We chose the schedules to be a good representation of high-rating and medium-rating segments. We have found that only two or three such schedule comparisons need be made. If the first two or so are good then the remainder of schedules will also be good.

Schedule A is 1 spot every quarter-hour between 19.00 and 21.30 for all 7 days in channels VTM, EEN, RTL-TVI.

Schedule B is 1 spot every quarter-hour between 17.30 and 23.00 for all 7 days in channels VTM, LA1, KANAL 2, VT4.

| Market | Schedule A | | | | Schedule B | | | |
| | Rating | | Reach % | | Rating | | Reach % | |
	Panel	Sesame	Panel	Panel	Panel	Sesame	Panel	Panel
All	6.8	6.2	78.6	76.4	2.8	2.5	74.4	72.3
Women <35	3.9	4.0	68.2	73.5	1.9	1.7	69.6	68.8
Women>35	9.2	8.2	82.1	80.4	3.5	3.1	74.8	72.9
Men<35	2.7	3.6	61.7	65.2	1.5	1.7	65.5	67.1
Men>35	7.9	6.7	82.9	80.2	3.2	2.8	75.8	74
Dutch Speaking.	8.7	7.5	85.3	82.1	3.8	3.3	75.3	77.8
French Speaking.	4.1	4.4	69.3	72.6	1.4	1.3	71	68.2

Note: The panel results are the average of only a few of the hundreds or thousands of possible spot distributions

Extending the average one week Virtual Diary to multiple weeks

The *Sesame* Radio/TV virtual diary (VDiary) model is based on a one-week diary. Schedules beyond one week are estimated and evaluated in the Sesame software using modeling curves tailored to the individual stations. These are very complex routines that also handle the cross media duplication issues created by print data being in the form of reading probabilities.

Within the Sanoma data base the print readership data is event based over time and not probability data. It is much simpler if the VDiary itself is extended to 'many weeks' in parallel with the print information. If this can be successfully achieved (and it can) then the new extended VDiary model is much more flexible than the old model. The new model lends itself easily to the application of media and dosage weights, and to the use of complex response functions. Essentially this is because, once a VDiary has been extended, obtaining schedule statistics is a simple counting exercise. It requires no additional modeling assumptions.

The creation of extended VDiaries is not complex theoretically. We have for any station its growth over a fixed period, usually from one week to one month. This growth can then be modeled and extended so that at any week after the first we know how many new viewers (listeners) we require in week n. This growth calculation is done separately for each calibration cell. We have well established methods which use not only the growth amount but also the rate of growth.

Thus for any cell and any week n we need to discard (say) D viewers and replace them with the same number of new viewers. This maintains the weekly reach of any station as constant. Of course if we have evidence that reach changes week to week – as it might for example during national holiday weeks – it is a simple matter to adjust.

We choose any new viewer to be as similar as possible as possible to the viewer they are replacing. Of course similarity is largely ensured by performing all operations calibration cell by calibration cell. But of course there may be informant characteristics which are not or cannot be included in the calibration cells since their use would make the calibration cells too small and unreliable to handle.

This process has now been used very successfully to create a number of long term Vdiaries. In the example below planners are now able to view their reach (net and gross advertising contacts) on a day by day basis. It shows very clearly the danger of viewing only the end accumulated R&F results as an AIR R&F analysis would show. Print can now be planned on the same basis of TV in terms of reach and GRP delivery on a day by day basis and the comparative levels with TV viewed directly.
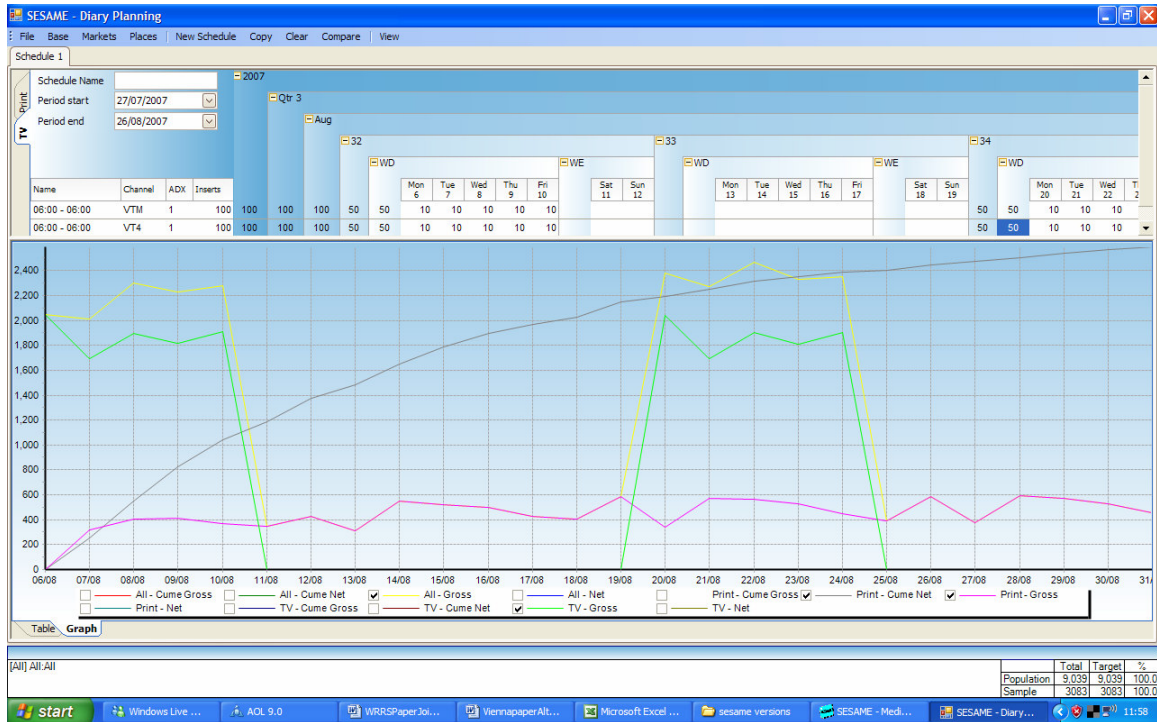
Four week cume comparisons

CIM/Audimetrie provide estimates of net reach (within target groups) that will be achieved at given level of GRP's based on a multiple randomizations of spot selections at each GRP level. A similar randomization process (but not identical) facility is available with the Sesame software. The comparative results are as follows. They are very similar up to 300 rating points after which the Sesame model provides a slower rate of net accumulation although both arrive finally at the same maximum (all spots) net reach (93.5%) for these channels.

Target group: shoppers 18-54 4 weeks Oct 2006 Channels: VTM, KII, VT4, VijfTV, RTL-Tvi, Club RTL, Plug TV, La Une, La Deux				
CIM/Audiemetrie Panel			Sanoma VDiary	
GRP's	**Reach 1+ %**	**Reach 2+ %**	**Reach 1+ %**	**Reach 2+ %**
100	48.3	28.2	48.3	27.0
200	61.0	44.5	61.3	43.6
300	68.4	54.1	66.2	52.7
400	73.6	60.9	68.9	57.9