

# **Better TV Data for Modelers: A Research Study for the Council for Research Excellence**

## **April 11, 2017**

### **Introduction**

Marketing mix models are fueled by media input data -- typically DMA-level weekly GRPS. We've seen, over the last few years, that aggregate market-level, overly averaged data that doesn't line up with weekly sales data doesn't show a medium in the best light -- modelers need more disaggregated data, variability and exposures properly aligned by week in order to tease out the impact of different media on sales. Through our work, we've made recommendations that increased the granularity in the data used in modeling media like cinema, magazines, outdoor, etc. We turned our attention to television because it is a very significant part of the marketing mix, generally, and we learned that advertising ROIs had begun to fall in general. Marketers were not as happy with television ROI as they had been.

We wondered if the television data used in marketing mix models could be improved. And after initial exploration and discussion with marketing mix modelers, we identified four technical television audience measurement areas that might be playing a role in under-valuing TV advertising in marketing mix models.

Before we get too far into the subject, it's worth a small detour into the current state of ROI measurement in general. For years, marketing mix models were used as the primary tool for assessing media contribution to sales. The models, which incorporated all media spend as well as pricing, promotion, and other operational variables, provided strategic guidance about the relative effectiveness and efficiency of advertising spend. Recently, however, there is a lot of focus on attribution models, which are disaggregated, household-level models, ostensibly operating in digital, but also being applied to addressable television. Attribution modeling is a tremendous analytic tool, with inordinate potential for decoding the efficiency of spend through a lens of person's level response to advertising. It is unlikely, however, that marketing mix models will be usurped by attribution modeling any time soon since cross-platform attribution models are only now beginning to address the breadth and scope required.

So, since marketing mix models will certainly be around for the near future, it makes sense to strive for the very best media input data with which to fuel the models.

Over the course of the past two years, Sequent Partners worked with Nielsen Media and Buy-Side MROI Product Leadership to address the four areas we identified for potential improvement. Sponsored by the Council for Research Excellence, we set out to determine:

## Better TV Data for Modelers: A CRE Research Study

- whether the television schedules -- weekly, DMA-level, HH GRPs currently being provided to modelers were sufficiently granular, precise and accurate
- whether improvements could be made
- and how much impact these improvements would have on television's read in marketing mix models? Would more granular, precise and accurate data improve models' estimates of TV ROI?

### Opportunities in TV Data for Modeling

In our exploration, we learned that there was an opportunity to produce more granular, precise and accurate television for the models. We recommended the industry consider:

1. Using precise commercial minute GRPs instead of local market quarter-hour GRPs
2. Using precise day GRPs, counting playback viewing when it occurs, rather than when the ad was aired.
3. Using real cable viewing data to replace estimates based on allocating audience proportionate to cable subscriber population.
4. Addressing greater variability and more precise viewing in diary markets.

The four areas we recommended for improvement were only associated with the Nielsen media data that's available to modelers. We know Nielsen has a great deal of audience data in-house or data available to media/agency clients, but our focus was on widely available modeler's data -- generally, television GRP data through Nielsen's Ad Intel service, formerly Ad\*Views. This paper shares the result of our investigation as well as key findings and recommendations.

### Summary of Findings

We are pleased with the outcome of this study. Nielsen provided a very robust examination of the issues and the impact some of these changes would have on television ROI. They have also agreed to make certain changes to strengthen the data streams for modelers.

- **Can using precise commercial minute make a difference in television ROI?**
  - Yes. Not very often. But when it makes a difference, TV ROIs are usually lower - the negative impact on sales lift can be sizeable.
- **Can utilizing precise day of DVR playback impact television RO?**
  - No. Definitely not at this time. Almost no difference between exposure levels by week since most DVR playback occurs within the week of airing.
- **Will actual cable viewing data be more precise?**
  - Yes. Nielsen didn't need to analyze this. They are making actual cable viewing data by DMA for major cable networks to modelers in Ad Intel.
- **Do diaries influence television ROI?**
  - This issue wasn't addressed either, since Nielsen has already announced that it is using return path data for diary markets starting in early 2018.

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Those are the highlights and conclusions of this extensive study. Read on to understand the analysis we undertook to arrive at those conclusions.

### Details: Precise Minute vs. Average Quarter-Hour Ratings

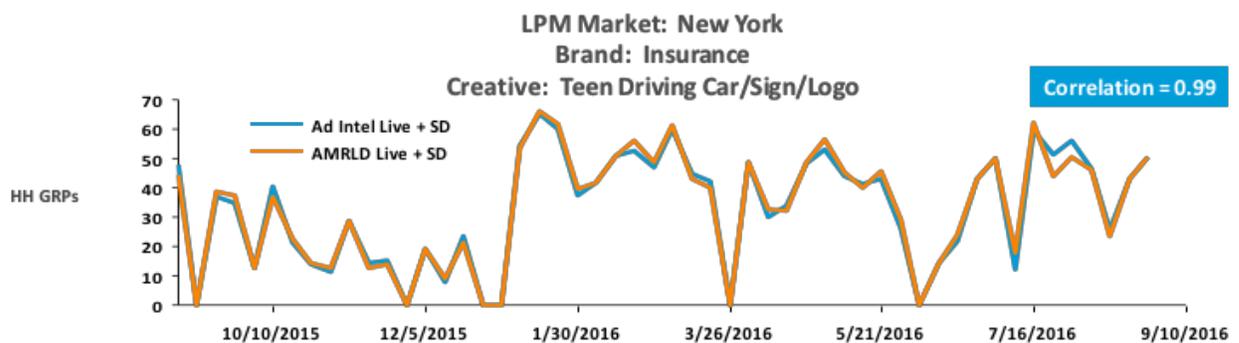
Nielsen undertook the study of the differences between precise minute and average quarter-hour ratings in marketing mix models by comparing Ad Intel (average quarter hour) ratings and All Minute Respondent Level Data from national and local people-meter markets.

- Six LPM markets were selected -- New York, LA, Chicago, Boston, Minneapolis and Charlotte.
- Sixteen brands were randomly selected from a sample of the top 300 network television spending brands for the 52 weeks ending August 28, 2016.
- Schedules associated with these brands were pulled at the creative-executional level. All in all, 3323 units of observation were used in this analysis.

Nielsen generated new precise minute GRPs for each of the schedules and correlated the two datasets – precise minute data and comparable quarter-hour GRP data from Ad Intel, the current standard.

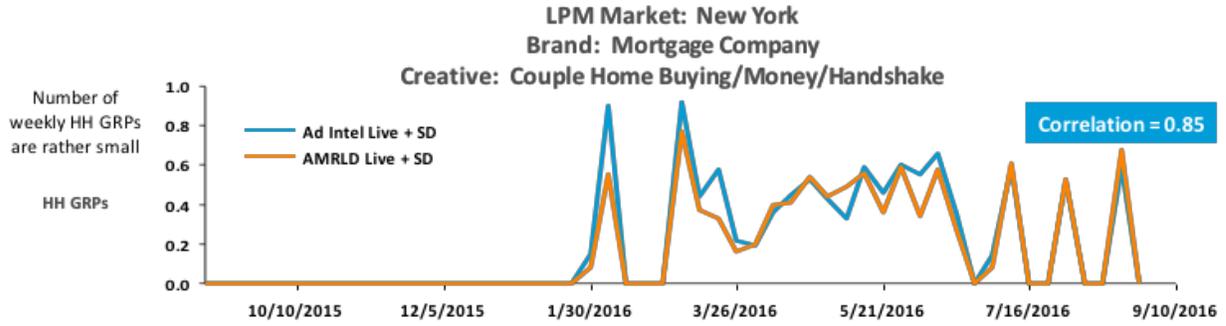
Nielsen calculated the correlations between Ad Intel quarter-hour household GRPs and average minute HH GRPs each brand, creative and market using the weekly data. Then, they conducted thousands of Monte Carlo simulations to test the likely impact on marketing mix models. If the correlation coefficient is close to 1 between the two data points, then using weekly average quarter hour HH GRPs will not substantially affect MMM-based TV Marketing Return on Investment (MROI).

Here's what the data looked like. In this example, the two schedules based on precise minute and average quarter hour are highly correlated -.99.



The chart on the next page is an example of a less-well correlated schedule, .85. The average quarter hour ratings are higher and lower than precise minute ratings across the various weeks.

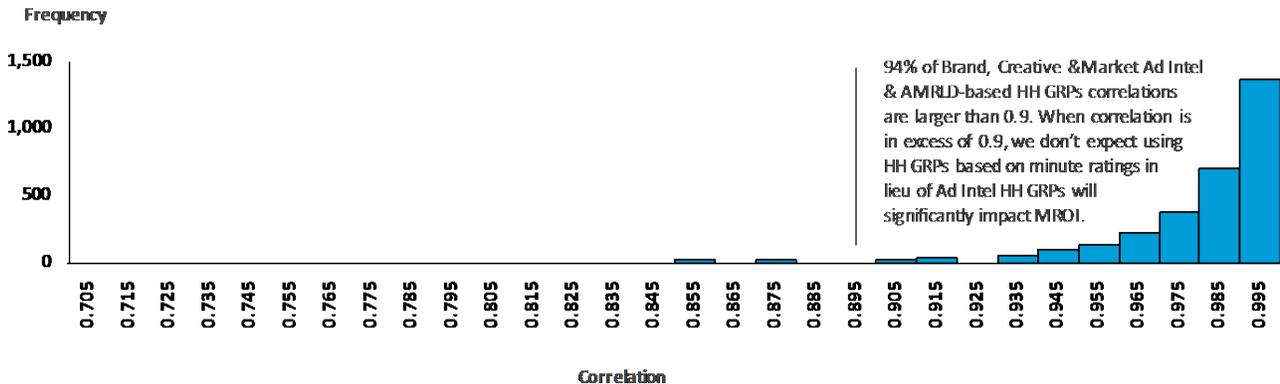
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When we look across the 16 brands in 25 markets, 90% of schedules had average quarter-hour and precise-minute correlations larger than .92. That's a lot, so we are not talking about an enormous difference between average quarter-hour ratings and precise minute ratings ... generally. Less than 2% of brand schedules had correlations of lower than .70 but they are not shown because they are distorted by virtue of having very few GRPs in the schedule.

### Distributions of Correlations Between Schedules Based On Average Quarter Hour vs. Precise Minute GRPs

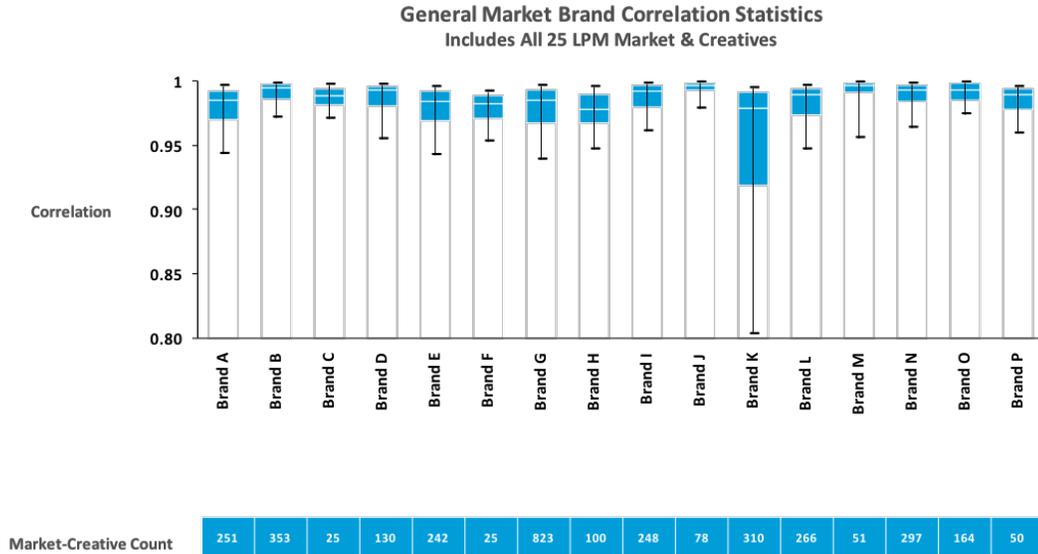
**Histogram of General Market Brand, Creative & Market Correlations**  
 All 25 LPM Markets, 16 Selected Brands & Their Creatives



But we wanted to drill down further to see what we could learn about brand schedules that did not correlate as well as the majority of the schedules.

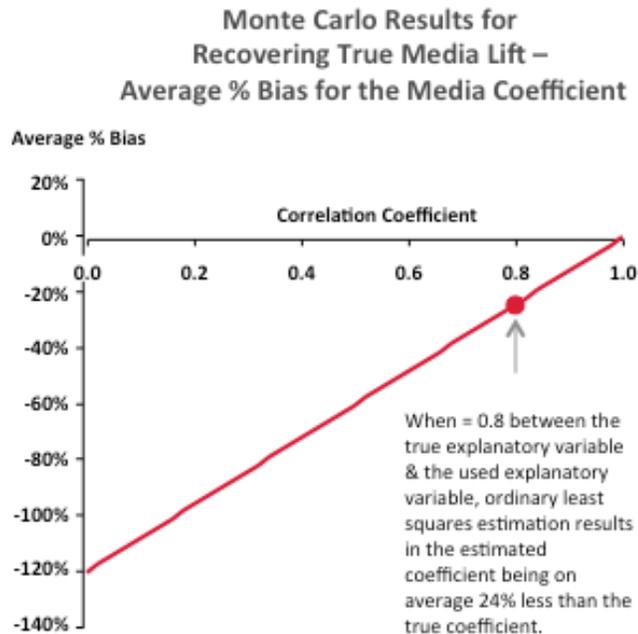
Looking at the specific brands across all the markets, the AdIntel and AMRLD GRPs for the Quicken Loan brand schedule, was not as highly correlated as other brands.

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For the Brands listed except Brand K, at least 90% of all correlations are larger than 0.93.

And it is this case that gives us pause. We're not certain why the correlations between average quarter hour and precise minute were less strong in this instance. The more important question is, what effect do these low-correlation cases have on a model's estimate of television's sales lift? The chart below relates those two statistics. The example called out shows that when the correlation is 0.8, the sales contribution of television is underestimated by 24%.



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We spent time with the Nielsen team correctly characterizing the impact a move to precise minute GRPs would have. We know that using data that is poorly correlated to actual exposures will usually underestimate the value of television. And we demonstrated that the chance of understating television's value is small, but the impact on the estimate of sales lift can be large.

- > **90% of the time, there is only a small difference between the precise minute and average quarter-hour datasets**
  - **Under-estimating the sales lift of television by about 3%, on average, and no more than about 10%**
- > **However, 10% of the time, the average under-estimate of television sales lift is about -20 percent**
  - **And close to 40% of time, it is statistically significant**

Sequent Partners recommends migrating to GRP data based on precise minute rather than average quarter-hours for modelers. Why incur the risk that your brand's ROI could be negatively impacted on the basis of this single variable when a better solution is possible?

Nielsen recommends evaluating the schedules ahead of time to determine whether they will have the characteristics of brands that might be impacted by precise minute vs. average quarter hour. At this time, the process for pre-screening schedules is unclear.

### **Details: Assigning Campaign Exposures to The Day of Playback versus the Air Date**

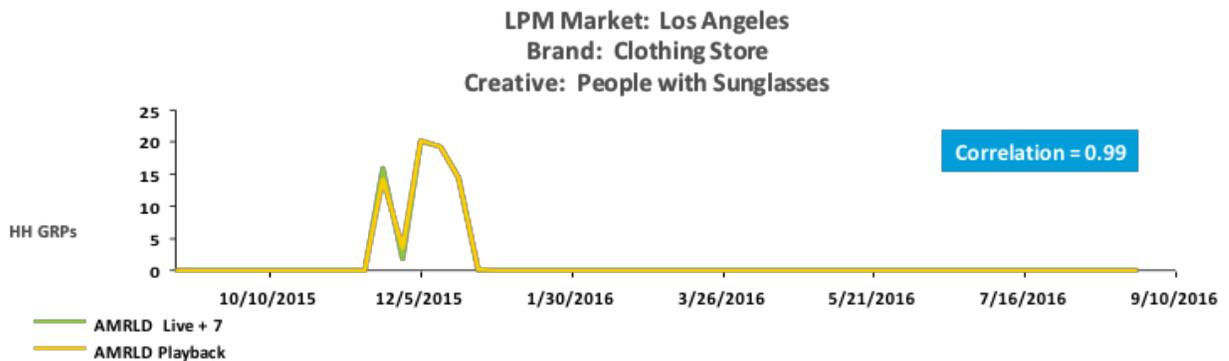
The second area we explored for improving audience data for marketing mix modeling involved DVR playback. Aligning media input data correctly by week is important in marketing mix models – and our thinking was that if exposures to a campaign actually occurred in future weeks due to DVR playback patterns, alignment between the schedule and its impact would be muddled.

Nielsen's study showed that right now, since most viewers playback an episode and are exposed to commercials within the same week, this is a non-issue. We found this surprising given all the press about the impact of DVR viewing on total audience estimates.

Nielsen approached this analysis similarly to the precise minute study. For each brand, creative, market schedule, they calculated weekly impressions based on Live + 7 GRPs and actual playback date and time. Then calculated the correlation between the two approaches.

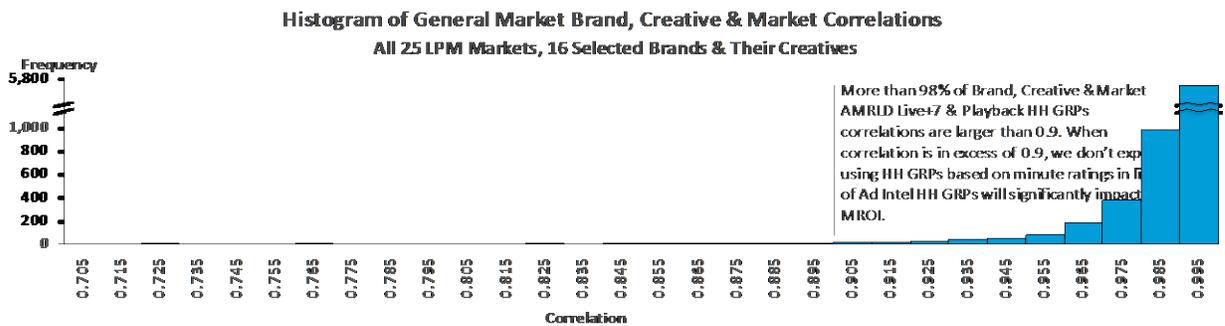
Here's what the weekly GRPs associated with Live + 7 and actual playback date and time datasets looked like on two specific schedules. They are very highly correlated.

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The chart below demonstrates that out of 3,618 creative executions, the minimum correlation value was 0.965.

## Distribution of Correlations between HH GRP schedules based on Live+7 Vs. one-week playback – Daily Data

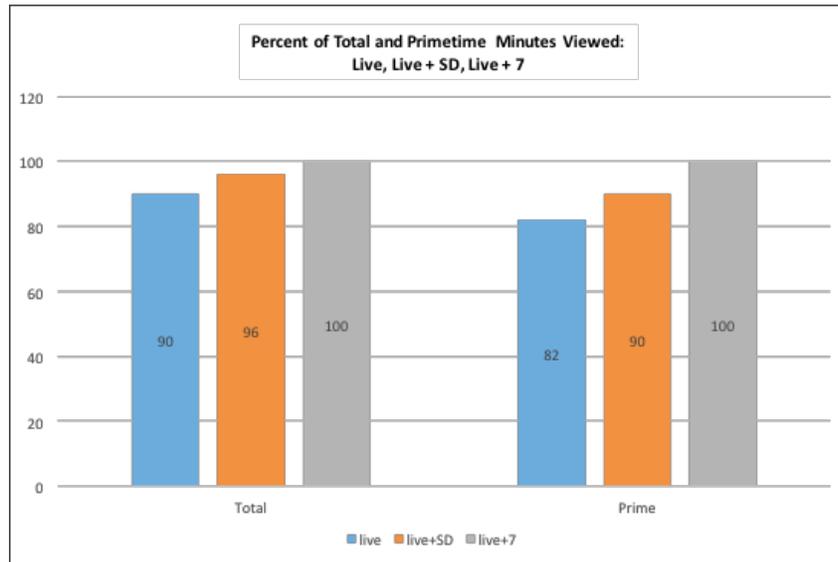


Therefore, we concluded that the level of correlation between Ad Intel Live + 7 Day and Precise Day GRP data is high enough to ensure that there would be no material under-estimate of television's ROI when air date is used versus playback date. As we said, this is surprising given the level of hype around the growing importance of playback viewing.

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Nielsen provided additional insights into this finding and provided the percent of total week viewing that was not viewed on the original air date:

- Only 4% of viewing occurs after the original airdate, in total, and 10% for primetime programs
- We infer that even less playback occurs beyond one week



Since so much of the focus of attribution is on daily data, we asked Nielsen to re-examine the impact of this data on a daily, not weekly basis. The results were the same.

This analysis surprised but convinced us that the way DVR playback viewing is attributed by week is not currently impacting television ROI. It may in the future, but it is not at this moment. This might be worth re-examining every few years.

### Details: Actual Cable Ratings Data

Over the course of our study of television data in marketing mix models, we were surprised to learn that the cable data modelers use is not actual local market viewing to national cable networks, it is cable networks' viewing in DMAs based on allocating national audience proportionate to cable subscriber population. It didn't seem right to have delivery of national cable audience for the DMA based on an estimate rather than a measurement of the audiences.

As we drilled into this topic with Nielsen, they announced that they will be changing this practice as part of their re-engineering of local television audience measurement. Nielsen currently has DMA level ratings for major cable networks in the LPM markets and will be using Return Path Data to measure audiences below the 25 local people meter markets. This will increase sample size and allow more national cable networks to be reported. The data will be used as the source of DMA-level national cable network GRP data in Ad Intel.

## **Better TV Data for Modelers: A CRE Research Study**

This is a major step forward and will provide a passive measure of HH tuning that is relatively consistent across DMAs.

### **Details: More Precise Viewing for Diary Markets**

At the beginning of this project, we were concerned about the accuracy of diary data and the potential bias introduced by three different measurement systems in different strata of DMAs. But we're pleased that this issue has been addressed by Nielsen's re-engineering of local market measurement -- broadcast and cable network data by DMA will now all be measured and reported the same way, using passive set-tuning return path data.

One issue the industry will certainly monitor is how this solution will impact measurement of Spanish language broadcast networks which tends to enjoy substantial over-the-air viewing.

### **Acknowledgement**

Sequent Partners wishes to thank Dave Poltrack and the ROI committee of the Council for Research Excellence for their guidance and support. We also thank Brian Weikel and Paul Donato of Nielsen for their extensive support and persistence in bringing this project to a successful conclusion. They did the heavy lifting under our guidance, but also proved to be excellent thinking partners as we collaboratively worked our way through very technical and subtle territory.