How Does Eye-Tracking Compare to “Click on What You Saw” and VAS Projections?

Eye-Tracking technology – the ability to capture, record, and assess a person’s focal point and gaze (through corneal reflection) – was originally developed over 50 years ago, primarily for military, medical and scientific applications.

In the early 1970’s, PRS IN VIVO pioneered its use in consumer research, as part of studies to assess and improve advertising and packaging – and since that time, eye-tracking has become a widely-accepted and validated technique in the market research industry. Specifically, the research, marketing and creative communities have acknowledged the value of eye-tracking in documenting the ability of marketing materials:

- To break through clutter and gain consideration (i.e. “Do shoppers even see a package within a cluttered shelf?”)
- To hold attention and highlight key marketing messages (i.e. “Do shoppers engage with specific on-pack elements / claims?”)

More recently, several companies have promoted alternative methodologies as acceptable “substitutes” for eye-tracking, including:

- A mouse-clicking exercise conducted via PC (“Click on what you saw”)
- A software algorithm intended to predict visual attention without actual consumer research (Visual Attention Service – VAS)

In this paper, we will share key examples and findings from recent parallel testing of these approaches, relative to in-person Eye-Tracking.

Executive Summary

This parallel research clearly shows that neither the mouse-clicking exercise nor VAS are viable substitutes for actual eye-tracking with quantitative samples, as they:

- Generate inaccurate data on an absolute level (% Noting brands or design elements)
• Lead to different research conclusions regarding the impact of new packaging (on-shelf visibility and the visibility of on-pack claims)

However, the mouse-clicking exercise may have value as a complement to eye-tracking, as an indication of what packaging elements shoppers find compelling, as opposed to documenting what they actually see.

**Eye-Tracking vs. “Click on What you Saw”**

To gauge this methodology, PRS IN VIVO fielded a series of parallel packaging studies:

• In each study, one set of 150 shoppers went through an Eye-Tracking exercise (recording what was actually seen ... as it occurred ... while viewing a series of cluttered product categories at the shelf and individual packages) conducted via in-person interviews in multiple central location facilities across the U.S.

• A matched set of 150 shoppers, with similar demographics and brand usage, saw the identical set of shelves and pack images via the Web and were asked to “click on the first 3 things that catch your attention” within each visual.

As the Cracker Jack example below illustrates, the data varied dramatically between the two techniques:

• While 81% of Web respondents clicked on the “Prize Inside” burst (as one of the first 3 things they “saw”), in-person Eye-Tracking revealed that only 33% of shoppers actually fixated on (“Noted”) that element as they viewed the packaging.

*Thus, the Clicking method dramatically overstated the actual visibility of this claim.*

Visibility levels varied widely between methodologies for several other packaging elements, including the background popcorn (56% Noting via PRS Eye-Tracking vs. 7% clicking) and the Jack & Bingo visual (30% Noting vs. 65%). In addition, the primary viewing pattern (represented by the arrows) also differed noticeably between the two methods, with varying “start points” (branding vs. claim) and flows.

In addition to comparing the absolute numbers between PRS Eye-Tracking and clicking, our parallel tests included Control Cells (respondents exposed to current packaging) and Test Designs for the packaging (respondents exposed to proposed new packaging designs). We focused our analysis on the shift in viewing patterns between the Control and Test packaging. Specifically, we analyzed whether the approaches would lead to similar conclusions on whether the Test design was increasing (or decreasing) the visibility of specific design elements (the
Prize Inside claim, the main visual, etc.). In the Cracker Jack example, the findings were dramatically different:

- Eye-Tracking revealed that the Test packaging increased the visibility of 2 of the 5 primary packaging elements, while decreasing the visibility of 3 other elements
  - For example, Eye-Tracking showed that the visibility of the “Prize Inside” flag was significantly higher in the Test design (vs. the Control).

The Clicking method reached the opposite conclusion on 4 of the 5 design elements.

- The Clicking method suggested that “Prize Inside” flag had significantly lower visibility in the Test design (vs. the Control).

Similar patterns were observed across many of the cases in which we ran parallel tests, on both shelf visibility and pack viewing patterns. The scatterplot below shows the weak relationship between the two data sets.
What do we believe is driving the significant differences between the methodologies?

Across packages, the Clicking data is higher on more “cognitive” (and perhaps more compelling) elements of the pack (such as the prize on Cracker Jack), while it is lower than PRS Eye-Tracking on more “mundane” (and perhaps less unique or compelling) elements, such as the popcorn. Perhaps, rather than “clicking on what they first saw,” shoppers are actually clicking on what most interested them. This hypothesis makes intuitive sense, given that the Clicking exercise requires a conscious thought process, while PRS Eye-Tracking is measuring a more physiological activity (actual eye fixations).

This hypothesis suggests that the Clicking exercise may offer value as part of a research study, if used/interpreted properly (e.g. “Click on what you liked.”). However, the data from the parallel research makes it clear this exercise should not be utilized as a substitute for eye-tracking, as it does not accurately document what people actually see (or miss).

**Eye-Tracking vs. Visual Attention Service (VAS)**

The VAS service is a software algorithm that is used to “predict” eye-tracking results. No actual consumer research is conducted: one simply uploads an image (of a shelf, a package, etc.) and the software projects the visibility of different elements within the image. The website for their service claims that “VAS functions like Eye-Tracking,” and references a validation study, in
which “eye-tracking results are compared to the predictions made by VAS on the same set of images ... the model was able to predict human fixations at around 85% of the theoretical limit.”

To verify this claim, PRS used the VAS service and loaded 20 images (of 10 shelves and 10 packs) into the VAS software and compared the results to those gathered from Eye-Tracking of the same images (conducted in central location studies, among a sample of 150 shoppers).

Shown below is the same Cracker Jack package, with the PRS Eye-Tracking findings compared to the VAS results. As the illustration reveals, the VAS results showed far less differentiation among the packaging elements, as most results were in the neighborhood of 50% – and it dramatically overestimated the visibility of the “Prize Inside” claim (56% vs. 33% from actual eye-tracking).

More importantly, the VAS system did not pick up any differentiation between the Control and Test packaging (not shown due to confidentiality). While PRS Eye-Tracking revealed significant differences (between Test and Control) in the visibility of all 5 primary design elements, the VAS system predicted no differences.
These two primary themes from the Cracker Jack case were repeated across multiple examples:

- The VAS system was particularly poor in predicting the visibility of on-pack claims and messaging (as it frequently projected higher visibility levels than documented via PRS Eye-Tracking).

- The VAS system did not appear to be very sensitive to detecting differences across design systems.

In fact, we found that over half of the research conclusions would have been different using the VAS system, as opposed to PRS Eye-Tracking. The scatterplot below shows the relationship between the two data sets. Note that the VAS data tends to cluster between about 40% and 65% for most data points.

![Scatterplot with R² = 0.42](image)

*What do we believe is driving the significant differences between the methodologies?*

While we were able to develop a hypothesis on the Clicking data as to why it differed from the Eye-Tracking (the fact that it’s a more cognitive exercise), there seemed to be little predictability with the VAS software. Simply put, the algorithm did not appear to be sufficiently...
sensitive or accurate enough to correctly predict actual shopper eye movement in the context of complex shelves and/or packages.

**Conclusions & Implications**

This parallel research shows that neither “Click On What you Saw” nor VAS are credible, accurate replacements for actual eye-tracking, as they:

- Generate inaccurate data on an absolute level (% Noting specific design elements)
- Lead to different research conclusions, regarding the impact of new packaging (on shelf visibility and the visibility of on-pack claims)

While there may be other valuable uses of these tools, they should not be considered substitutes for quantitative eye-tracking.

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