Understanding the issue of age-based bias in active audience measurement panels

October 2024

cimm Coalition for Innovative Media Measurement

TVISION

What You Need to Know: Research in Brief

Understanding the issue of age-based bias in active audience measurement panels

- Buy-side and sell-side stakeholders are heavily invested in **understanding differences between legacy measurement and alternative currencies.**
- This study uses an **artificial simulation of an active panel** to explore potential age-based bias in active panels. It is **not an active representation** of a real panel, but helps to explore the issue by:
  - Deploying an active metering simulation to passive panel participants.
  - Using behavior monitored on active and passive panelists in the simulation to explore points of divergence.
- The data collected **illustrates what can go wrong** if appropriate steps aren't taken to correct for non-compliance in active panels.

The study illustrates some of the challenges facing measurement providers leveraging active panel offerings as part of their solutions:

- The resources required to manage an active panel metering solution on an ongoing basis are significant, with response rates eroding over time unless the panel is actively managed.
- Non-compliance on an active panel could be the result of panelist error or a technical fault, or it could represent actual viewing behavior. Distinguishing between these issues is complex, requiring field team visits and/or complex modelling work to correct. With a large 40,000+ panel, this requires significant resourcing – and, ultimately, higher costs for the industry.
- Even in the short-term, small errors may be inevitable. Imagine a panel household that complies for a short period, then stops complying for a few sessions, then begins complying again. Over time, non-compliance adds up and errors creep in. Equally, consider a case in which a TV is on but no buttons have been pressed, such that the viewing audience is unidentified for a period of time. The measurement provider needs to make a decision about how best to assign this viewing, given the composition of the household – introducing more complexity.

Although measurement providers have developed sophisticated methodologies for addressing non-compliance on active panels, the effectiveness of these corrections remains unclear to many end users and can be difficult to determine, unless some kind of secondary measurement check is introduced on an ongoing basis to determine whether the corrections that are being made are accurate.

The Emergence of Alternative Currencies Creates New Questions

What is the suitability of legacy person-level data collection practices?

CURRENT SITUATION

- During the past few years, the US currency marketplace has become more competitive, with numerous vendors making great strides in bringing together smart TV / set top box data with panel data. Methodologies vary widely.
- Both buy-side and sell-side stakeholders are heavily invested in understanding the differences between the various currency-grade measurement solutions.
- One common observation is that measurement estimates produced by different vendors can vary widely, especially when it comes to personification. Personification measures the people actually viewing a given program or service, in front of the glass.
- One possible cause of divergence is the use of active vs passive metering approaches.

The purpose of this study is to provide insight, via an active simulation, into whether the data collected through active measurement panels could be a potential explanation for these differences.

Two Approaches to Persons Measurement

Passive Measurement

- Data collection methods designed to minimize disruption and active participation of the person(s) under measurement.
- For example:
  - **Ethnographic study:** Behavior observed in-person or via camera and annotated by a human researcher.
  - **Personal People Meter:** Small device kept on person of all panelists under measurement, content exposure detected based on audio signals.
  - **Passive Meter:** Presence detected via camera or beacon technology, content measured via other means.
- The idea of passive measurement is to disrupt native behaviors as little as possible in order to reduce the potential for human compliance to impact results.

Active Measurement

- Data collection methods that require actions on the behalf of the person(s) under measurement to collect data.
- For example:
  - **People Meter**: Presence reported via button press.
  - **Diary**: Panelists record viewing behaviors over a concentrated period of time to inform ratings.
  - **Survey**: Panelists respond to survey questions after-the-fact to identify exposure.
  - **Interview**: Coincidental interview studies are commonplace when operating a panel.
- These methods became common practice when large-scale TV measurement panels were established and have become the primary source off which we base TV ratings.

What You Need to Know

A brief note on active panels

It is important to acknowledge the significant investment that active panel companies make in delivering quality data for the industry:

- **Continuous Panel Management**
- **Training Reinforcement**
- **Error Catching** based on deviation from normal patterns for each individual (over 100,000)
- **Numerous Proprietary Algorithms**

=

Although not publicly available, data is typically released (at least quarterly) to governing bodies and is subject to rigorous review.

The authors and advisors to this study do not assume that the level of variance observed in this simulation translates at scale to final reported numbers. However it does highlight the types of headwinds that need to be managed – all of which drive up costs and decrease transparency.

This Study used Various Technologies to Create a Simulation, Designed to Explore Potential Differences between Active and Passive Metering

Sample

- Stratified household sampling from within TVision US panel (6 age/gender cells of ~30 ppl)
- Two phases of recruitment
- Panelists compensated for participation (cash + tablet)
- 1 week of training + 4 weeks of data collection

Tech

- TV Tuning (Linear & CTV) data based on TVision system
- Presence measured using two forms of technology:
  - Passive-metering using computer vision
  - Active self-reporting via custom tablet app

Analysis

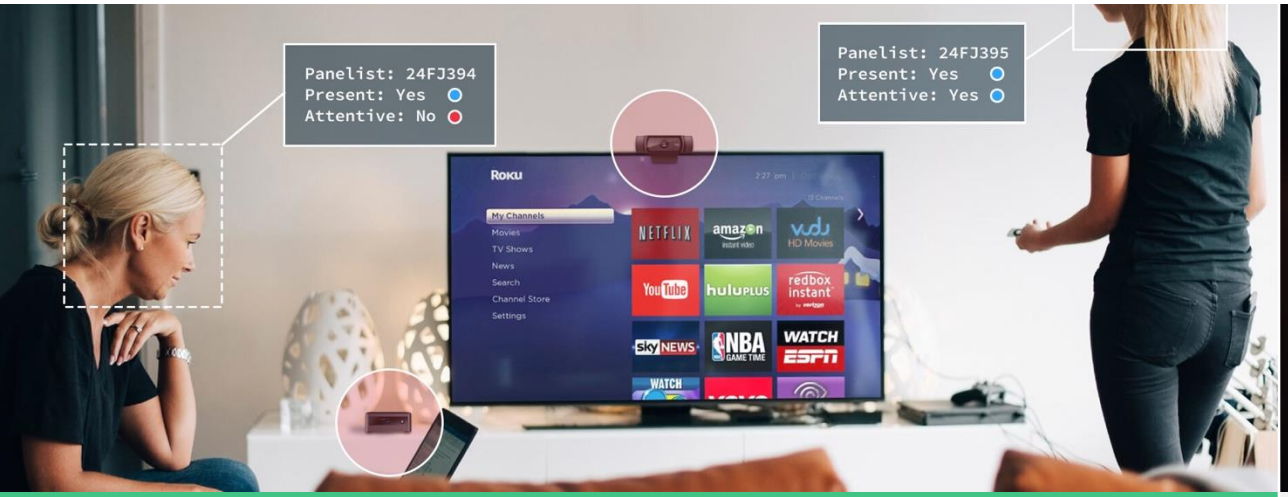
- Tuning seconds classified based on alignment between passive and active meters[1]:
  - Aligned In-Room
  - Aligned Not Viewing
  - Active Overreporting
  - Active Underreporting

Limitations

- Leveraged a convenience sample from within the TVision panel, focused on the primary TV in each panelist home.
- The tablet application provides a simulation of active metering but is not a complete replication of legacy methods. (no period of continuous panel training and monitoring, non-separation of prompter from pushbuttons, fixed session timeout after 40 minutes)
- The timeframe for the study was limited.

(1) Guests were measured but excluded from analysis due to absence of demographic data

Panelists were Provided with a Tablet and Instructed to Self-Report Viewing Behaviors, Alongside Existing Passive Metering Technology



Passive Measurement (TVision)

- ACR measures tuning behavior (what is on the screen).
- Computer Vision determines who is in the room and if/when they are paying attention.(1)
- Viewing behavior is linked back to individual registered viewer profiles.

Active Measurement (Custom App)

- TVision households were provided with customized tablet with application to self-report viewership.
- Application interface was tailored to household profile (with option of adding guests).
- Panelists were instructed to check-in when viewing, and check-out when not viewing.(2)

(1) Attention analysis is out of scope for this study; (2) Basic edit rules built into the application to alert and then time out sessions after 40 mins.

Key Findings from the Simulation

Potential issues to address when managing an active metering panel

Up to 44% of time that TV is on **is over or under-reported by viewers.**

As much as 7x more likely to **under-report viewing by 18-34s than to over-report.**

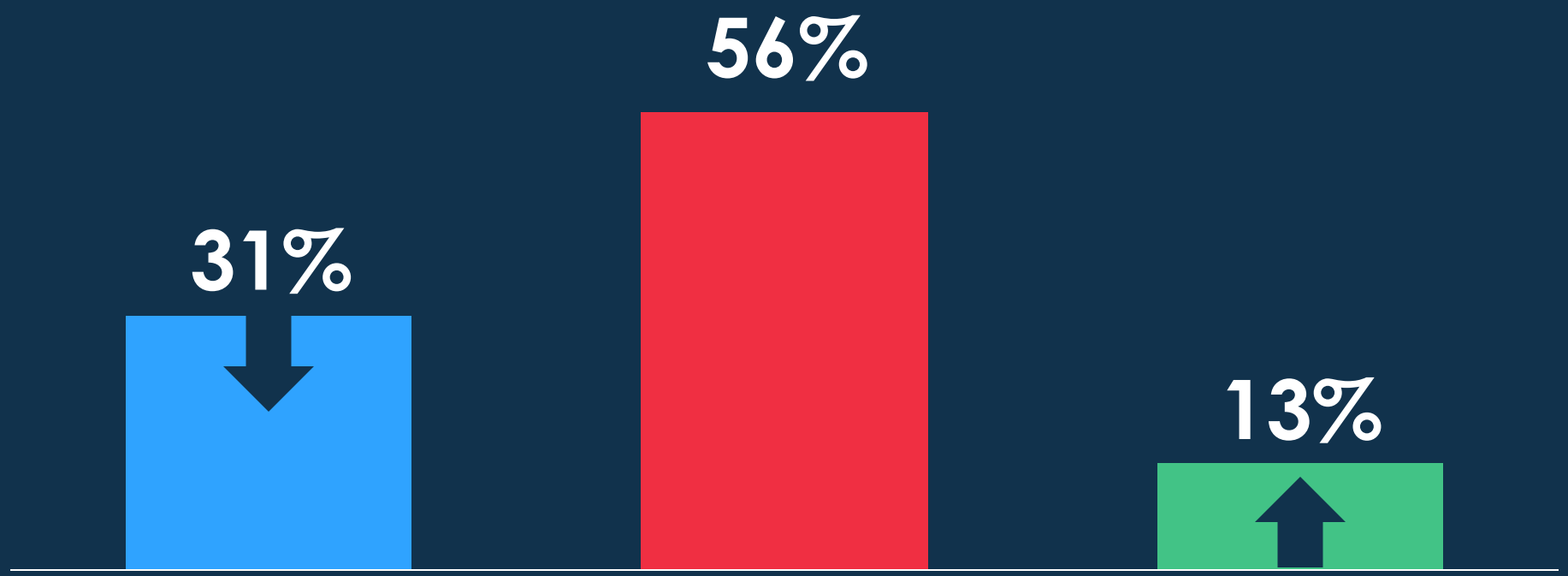
Up to 50% **increase in under-reported viewing seconds from week 0 to week 4.**

Measurement vendors need to communicate the practical steps and corrections they make to address these reporting issues in order to help end users understand the differences between vendor outputs and methodologies.

TVision Parallel Collection Study 2/16/2024 - 3/19/2024 | Excluding Each Household's First Week of "Training" and any "Non-Cooperative" households | Not all households on the exact same timeline

When the Television is on, the Simulation Found that Passive and Active Metering Approaches Agree on Viewer Counts 56% of the Time

PERCENT OF TV ON SECONDS



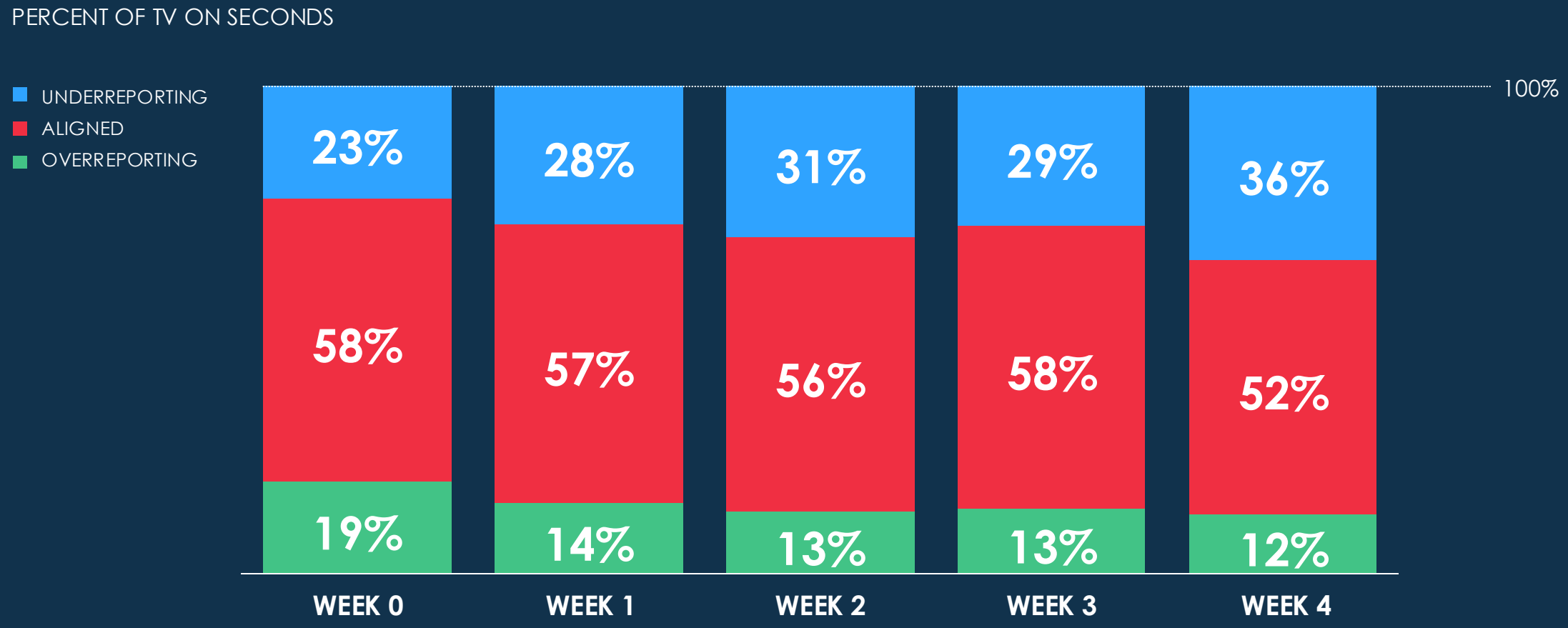
More people reported by passive meter than active meter.

More people reported by active meter than passive meter.

TVision Parallel Collection Study 2/16/2024 - 3/19/2024 | Excluding Each Household's First Week of "Training" and any "Non-Cooperative" households

Simulation Highlights Active Panel Underreporting Challenges

The simulation evidences viewer fatigue over time on active panels, highlighting the importance of active management.



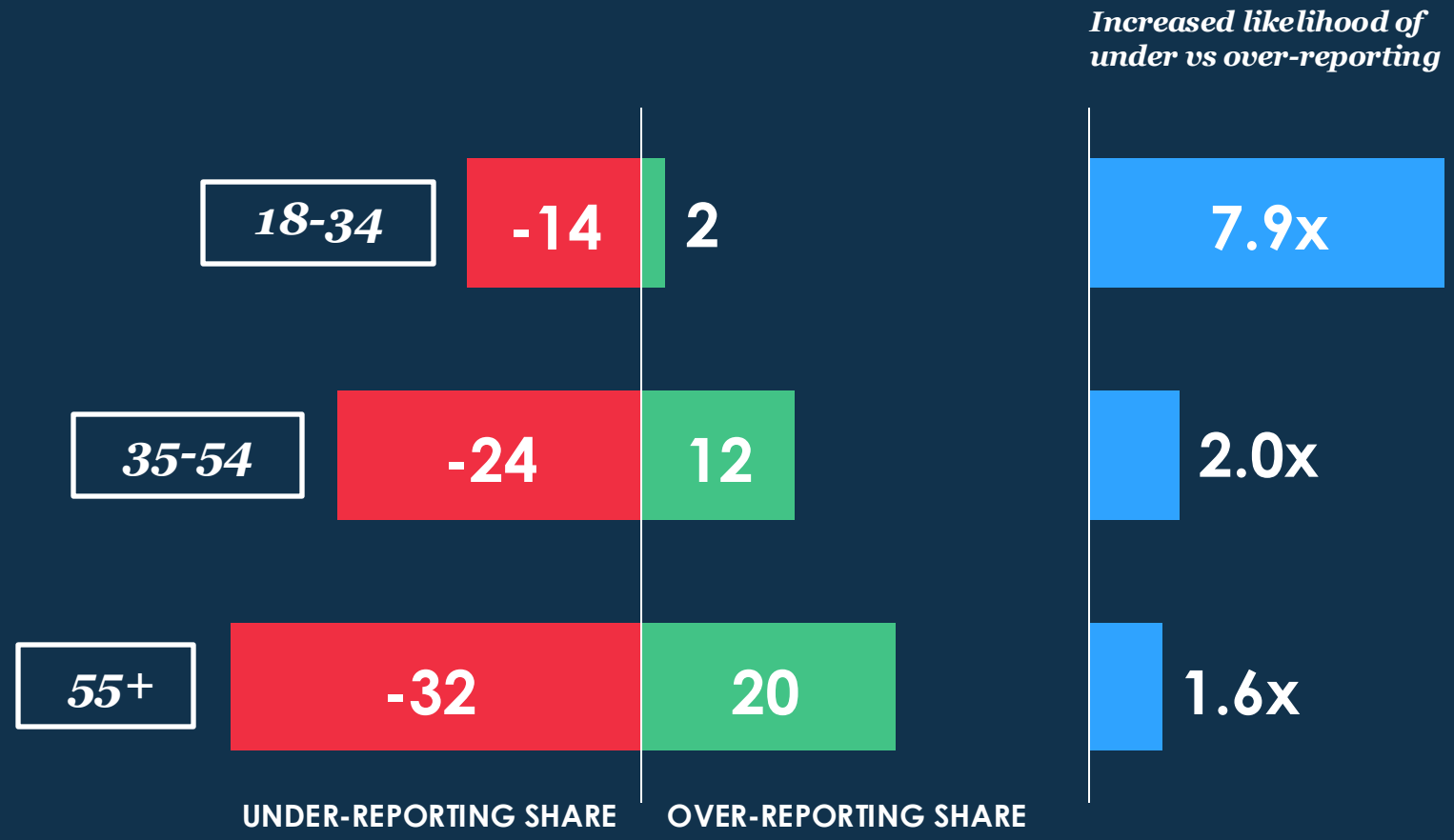
TVision Parallel Collection Study 2/16/2024 - 3/19/2024 | Excluding Each Household's First Week of "Training" and any "Non-Cooperative" households

Active Panels face Non-Compliance Challenges Across all Age Bands, with Significant Variations between Different Cohorts

INDEX OF TV ON SECONDS (BY AGE BAND)

- TV is on, person in the room, and they are not checked in to the active meter
- TV is on, person is not in the room, but they are checked in to the active meter
- Skew in the nature of the error experienced by the age band

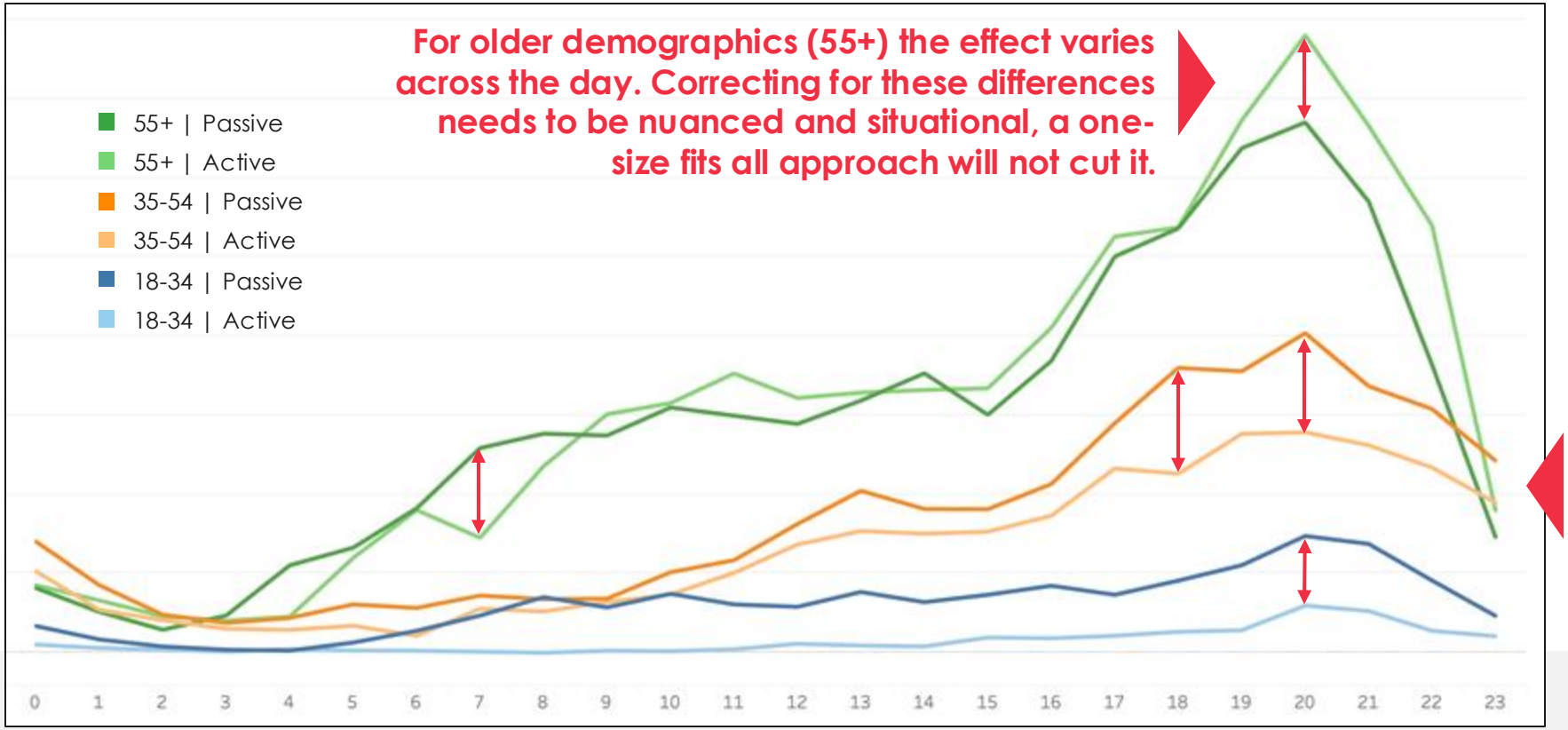
- The error rate is much higher for older demographics, but over and under reporting more-or-less offsets each other.
- The skew is much greater for younger viewers resulting in a greater propensity to underreport viewing.



TVision Parallel Collection Study 2/16/2024 - 3/19/2024 | Excluding Each Household's First Week of "Training" and any "Non-Cooperative" households
Share is calculated as % of Seconds Over/Underreported relative to % of Seconds Accurately Classified

Across a Typical Viewing Day, these Factors would have Material Consequences for TV Ratings, Varying by Daypart

Hourly TV consumption by age band (Passive vs Active Metering)



Across the day the active meter consistently under-reports total viewing for the two younger demographics (18-34 / 35-54).

TVision Parallel Collection Study 2/16/2024 - 3/19/2024 | Excluding Each Household's First Week of "Training" and any "Non-Cooperative" households
Index is calculated as % of Seconds Over/Underreported relative to % of Seconds Accurately Classified

There are Several Important Lessons for the Measurement Industry to Consider, in a Multi-Currency Marketplace

Age-based Skews May Impact Accuracy

There are clearly significant variations in viewing behavior across different demographics that can materially impact measurement outputs derived from active metered panels.

Active Metering Requires Active Management

Panel compliance issues present themselves rapidly and require active management to maintain compliance – this can be expensive.

Transparent Reporting on Limitations

End users require transparency about methods and modelling corrections, to fully understand how age-based reporting differences are addressed.

Questions?

Tristan Webster

tristan@tvisioninsights.com

TVISION