Introduction to the Application of Wearable Eye-Tracking Devices in Marketing Research

Outline

1. Introduction to Eye-Tracking
2. Wearable Eye-Tracking Devices and Marketing Research
3. Application Examples
4. Summary

Eye Tracking Technology

Photo Source: Ophthalmic photographers' Society

- Detects eye movement information to understand the user's gaze location.
- It also includes information such as pupil position and size, gaze direction, and blinking behavior.

Types of Eye Trackers

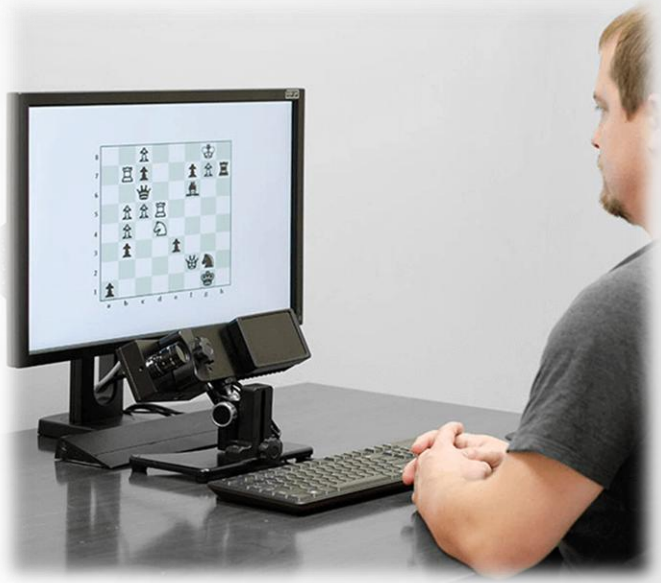


Photo Source: 錫昌科技

- Wearable Eye tracker
  - **Pros:** Can be used in a variety of real-world situations.
  - **Cons:** Lower spatial and temporal resolution.
- Remote Eye tracker
  - **Pros:** Higher spatial and temporal resolution
  - **Cons:** Limited to specific usage environments.

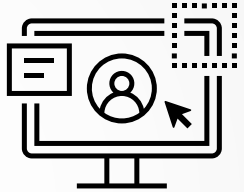
Main Applications of Wearable Eye-trackers

Scientific Research

- Medicine
- Psychology
- Neuroscience
- Ergonomics

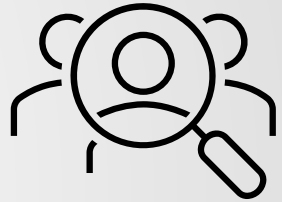
Employee training evaluation

- Knowledge transfer
- Visual inspection
- Process standardization



User experience research

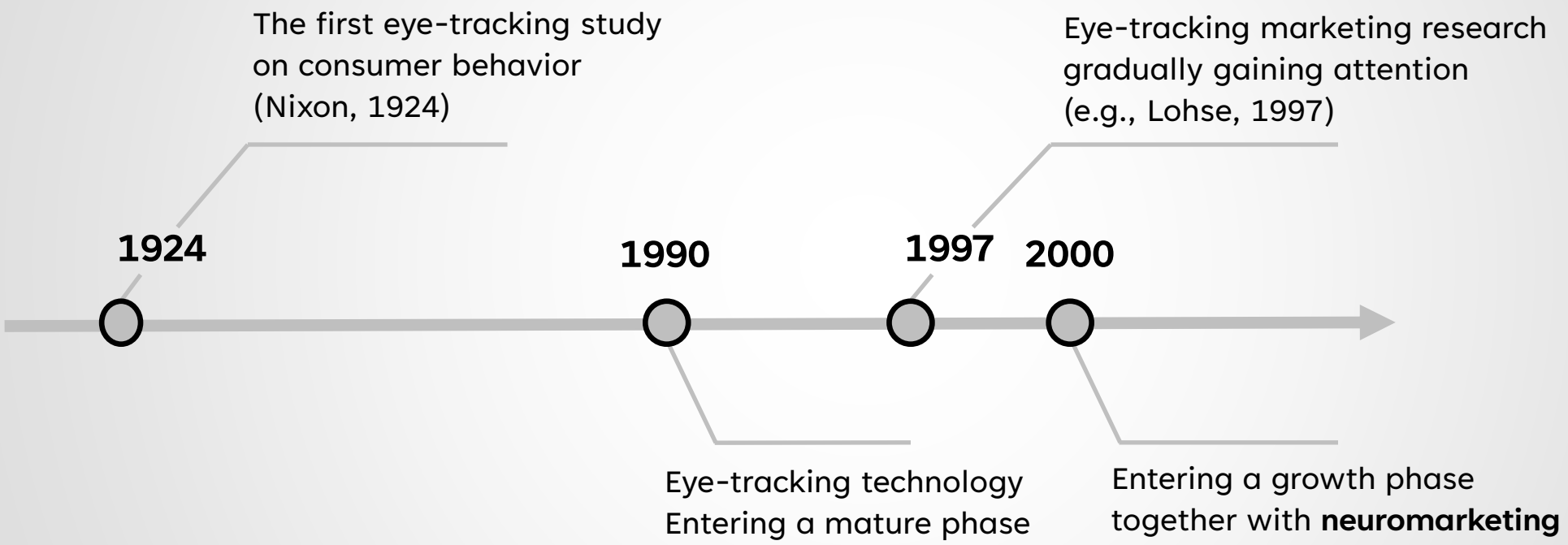
- Driving experience
- Mobile devices



Marketing research

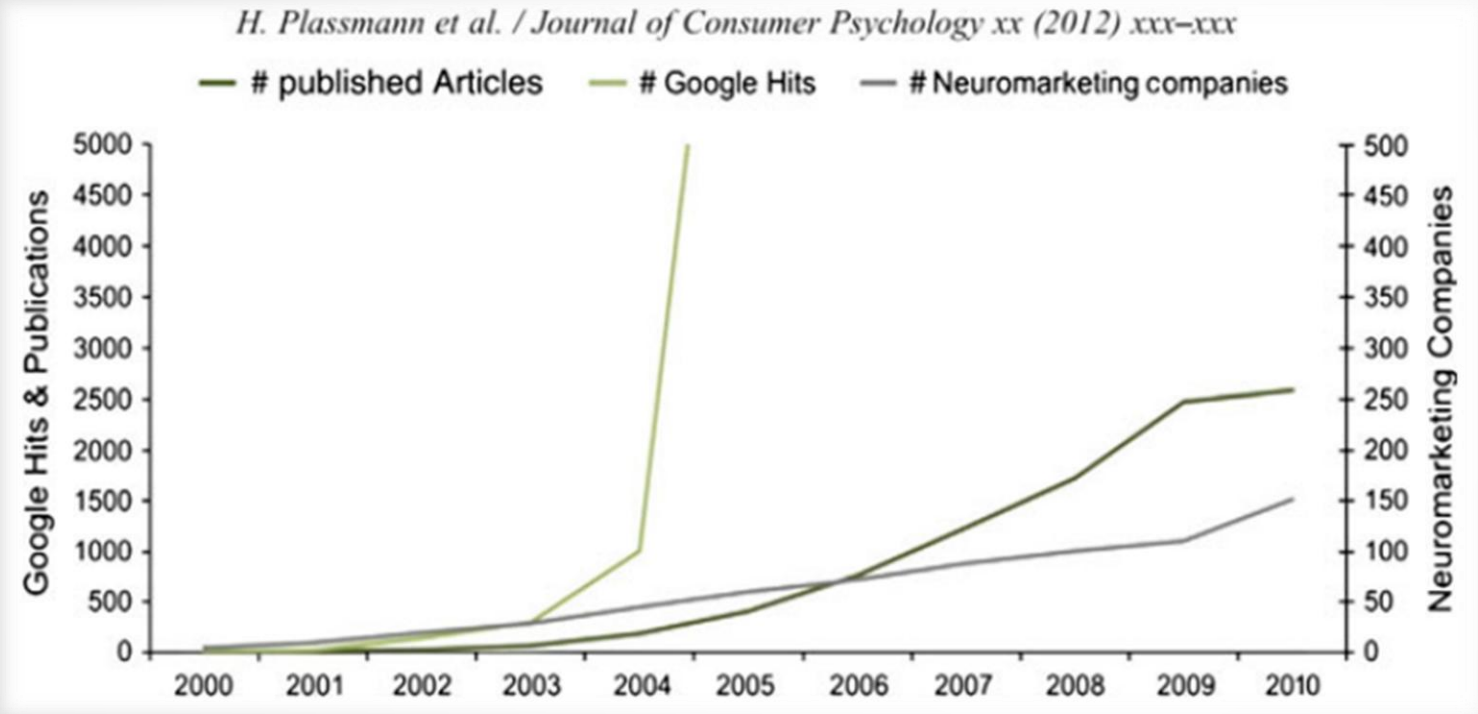
- Packaging design
- Advertising design
- Exhibition design
- User behavior

The evolution of eye-tracking data applications in marketing research



Rothensee & Reiter, 2019

Growth trends in neuromarketing



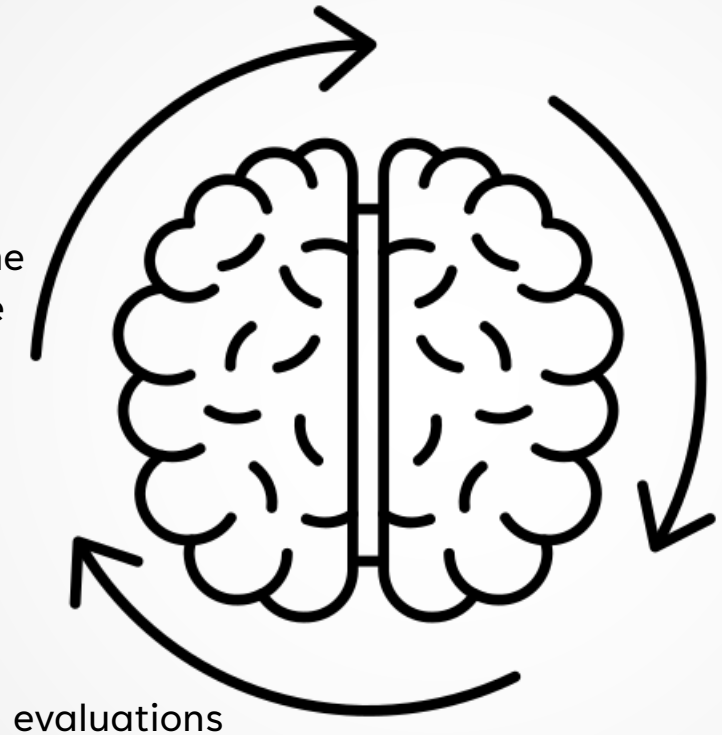
The number of companies related to neuromarketing began to increase significantly after 2003.

Plassmann, Ramsoy, & Milosavljevic, 2012

Benefits of using eye-tracking data in marketing research

Evolution

Brain mechanisms do not undergo drastic changes due to changes in the living environment, so investigating the brain's processing pathways can more effectively predict consumer behavior.



Attentional selection

Only a small portion of the vast information in the environment is processed by consumers, and eye-tracking is the most effective technology for revealing consumers' attentional distribution.

Avoid subjective reporting bias

Consumers often avoid giving negative evaluations due to social expectations, or they may forget product or advertisement content, making it difficult to provide objective feedback on marketing activities. Eye-tracking data can help avoid these biases.

Rothensee & Reiter, 2019

Product packaging design

Photo Source: Kaago

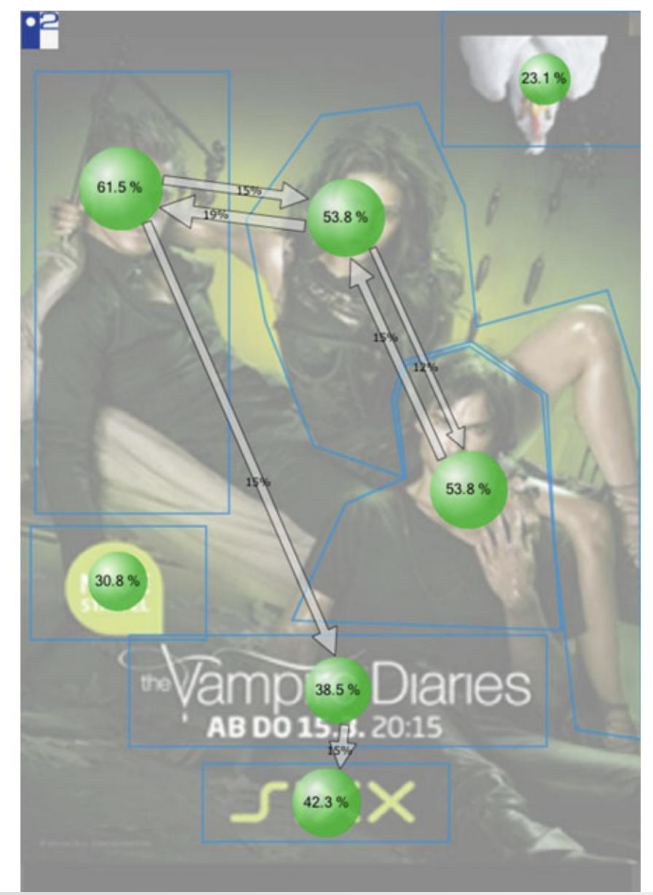
- **Japanese Earth Pharmaceutical Mouthwash “MONDAHMIN”**
- Launched in 1987, very well-known
- Do consumers still pay attention to the small stickers on the packaging when making a purchase?

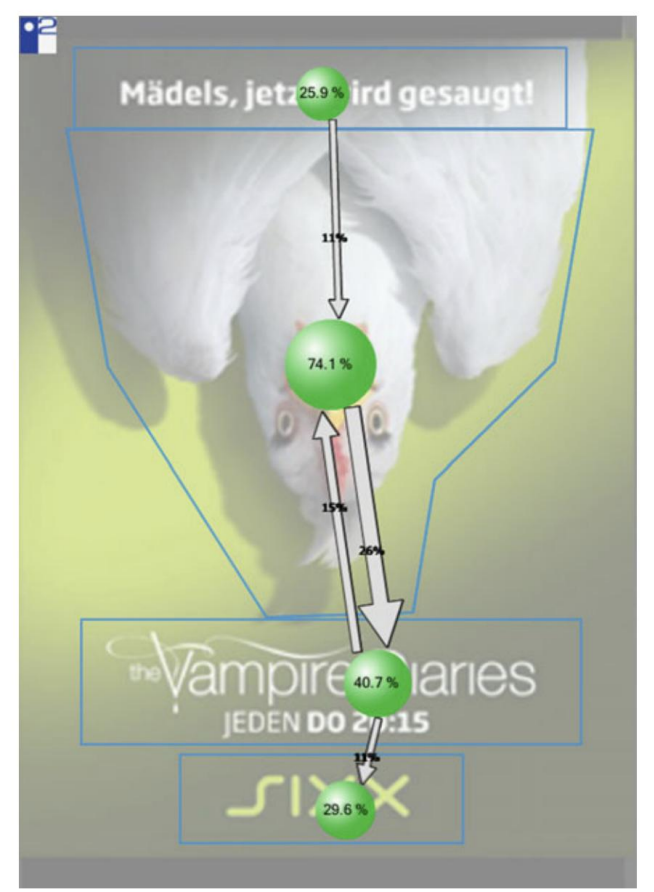
Shelf analysis

Photo Source: Tobii

- **Experiment:** Measure attentional distribution when selecting mouthwash
  - **Participants:** Women aged 30–50
- Consumers do pay attention to the small stickers
- Time spent looking at the small stickers increases when deciding which product to buy
- Continue using small stickers on the packaging (Tobii, n.d., a)

Promotional poster selection



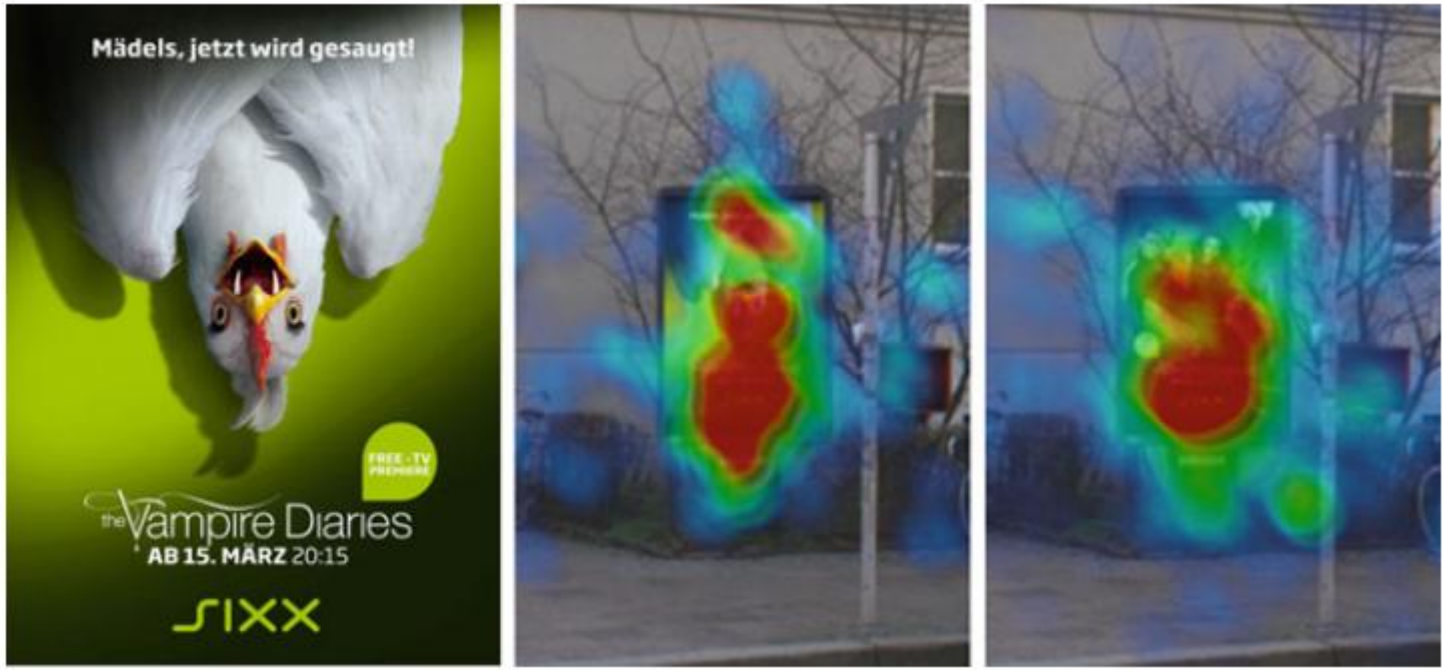


German TV Channel SIXX

- Chose to promote the poster for *Vampire Diaries* (Bloodthirsty Y Generation)
- Actor version vs. TV channel mascot version

Rothensee & Reiter, 2019

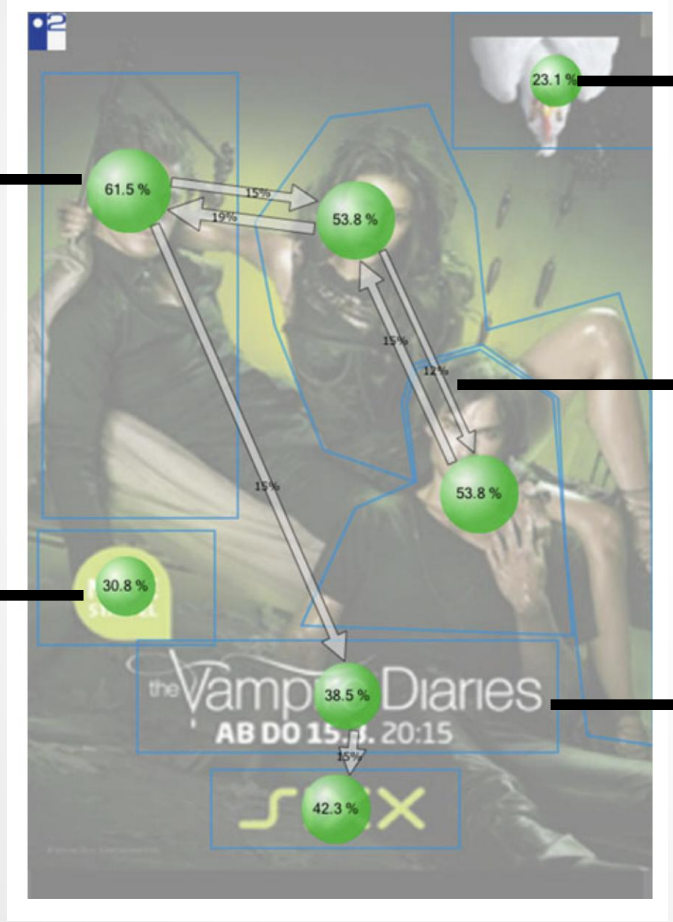
Test scenario



- Review eye-tracking data of participants in a simulated street environment viewing advertisements.
- Chose the TV channel mascot version.

Rothensee & Reiter, 2019

Issues with the poster on the left



The mascot is isolated

The actor attracts too much attention

Attention shifts mostly between the actors

It is difficult to process information from so many different areas in a short period of time

Program information receives relatively less attention

Showroom design

圖片來源: Tobii

Canada Toyota

- **Problem:** Which information do consumers pay attention to when selecting a car
- **Test scenario:** Record consumers' eye-tracking data within the showroom

Tobii & Toyota, 2017

Attentional distribution on vehicle exterior

圖片來源: Tobii

- Attention is focused on the driver's side
  - Front row receives the most attention
- Relative inattention to the rear seats
  - The most noticed element is the logo

Tobii & Toyota, 2017

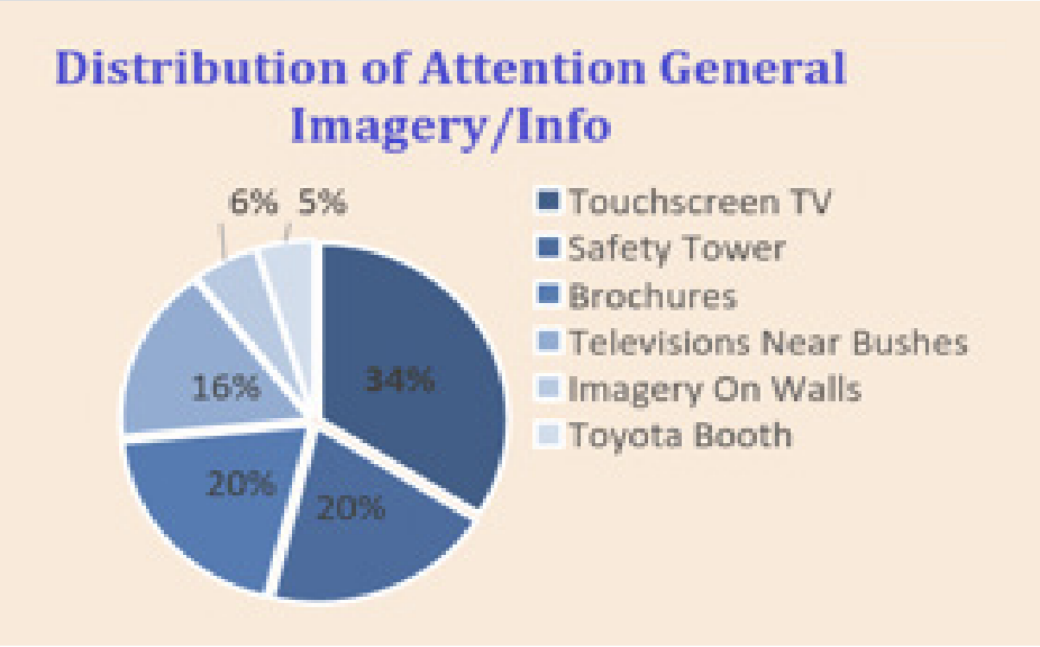
Attentional distribution on the interior

圖片來源: Tobii

- The most viewed parts are the gear shift, steering wheel, and dashboard
- Trunk space comes next
- Rear seat space receives little attention
- Almost no one opens the hood in the showroom

Tobii & Toyota, 2017

Other vehicle information



Safety Info.

Photo Source: Tobii

- Spend the most time interacting with the touchscreen
- Attention to vehicle safety information is similar to that given to promotional brochures
- The Toyota brand image makes consumers particularly attentive to safety

Tobii & Toyota, 2017

Insights obtained from eye-tracking data

Photo Source: Tobii

- Make it easy for visitors to move toward the driver's side
- Emphasize lighting on the driver's side
- Power information should be highlighted with text
- Safety information should be placed near the vehicle

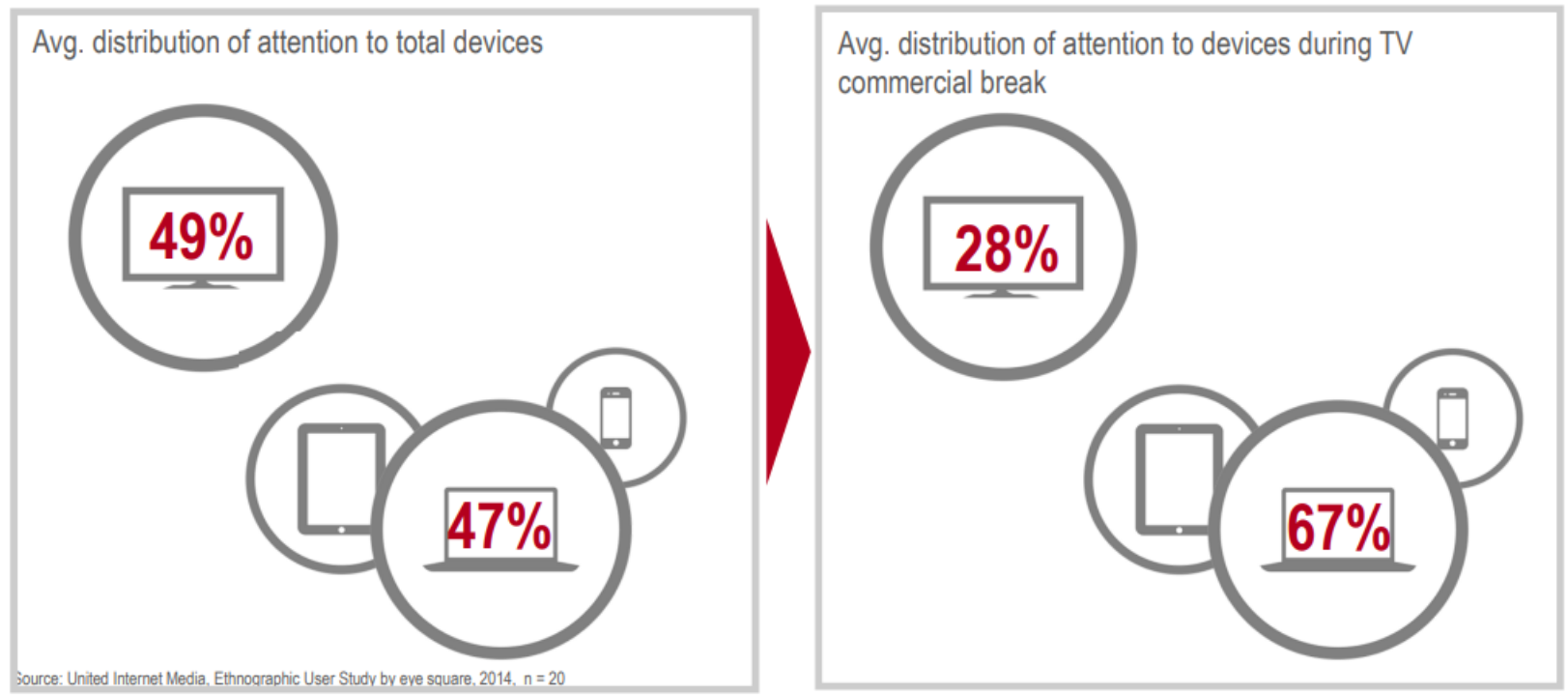
Tobii & Toyota, 2017

Multimedia usage behavior research

- Proportion of time spent using other devices while watching TV
- Subjective report data is inconsistent
    - 59% of the time watching TV (Universal McCann, 2014)
    - 28% of the time watching TV (TNS, 2013)
- Actual investigation using wearable eye-tracking devices on 20 households' evening leisure activities (United Internet Media, 2014)

圖片來源: proximus

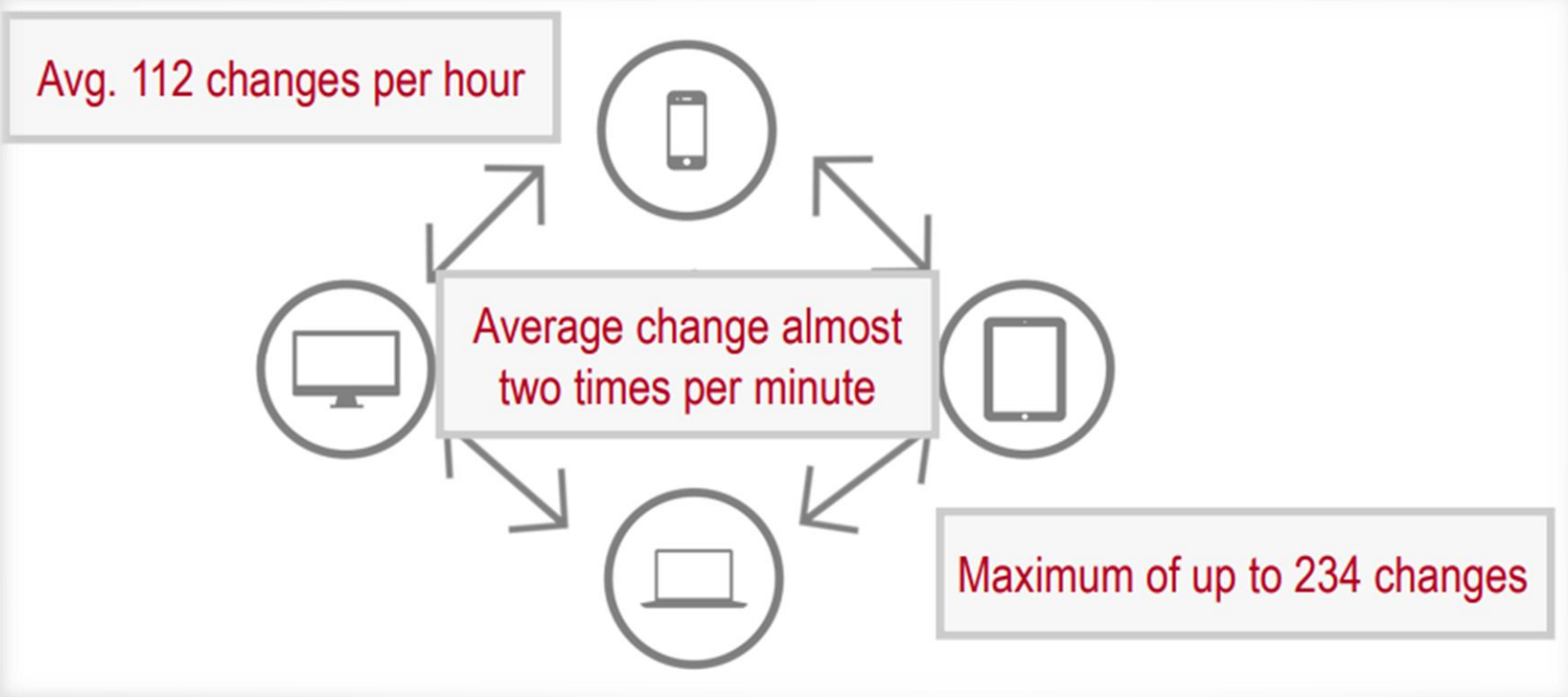
Attention frequently switches between devices



- Time spent on TV and mobile devices is roughly equal
- During TV commercials, most people are looking at other devices

United Internet Media, 2014

Why can subjective report results be biased?



- On average, attention switches between devices 112 times per hour
- Too frequent for respondents to accurately recall their own behavior

United Internet Media, 2014

Key points of eye-tracking marketing research

Clearly define the marketing problem

- Do they look at the small sticker?
- Which poster do they choose?
- How is attention distributed in the showroom?
- Are they using multiple devices simultaneously?

Definition of the target audience

- Shoppers of daily necessities
- TV series audience
- Car buyers
- TV commercial viewers

Selection of the test scenario

- Shelf scenario
- Shopping street scene
- Car show display area
- Evening leisure time at home

Eye-tracking data analysis

- Heat map
- Gaze Plot
- Proportion of fixation time
- AOI switching frequency

Reference

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