Decoding Digital Video Environments

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eye square

real eyes

∞ Meta

Executive Summary

The media landscape has changed rapidly in recent years, with the introduction of new digital ad formats creating both opportunity and increased complexity for advertisers. Despite this, the industry still often uses the broad categories of video versus display for infrastructure and reporting, which does not capture the immense nuance of available ad formats.

This research - executed by Realeyes in partnership with eye square and Bill Harvey Consulting - used simulated apps to execute an experimental study across major digital platforms to investigate whether there is evidence for more granular environment types. Analysis of a comprehensive suite of metrics – including mindset, view time, engagement, visual attention and brand outcomes - confirmed there are distinct environments within digital video. While each of the tested environments had very distinct consumer behavior patterns, brand recognition was similar, suggesting that marketers should focus on leveraging each environment's unique strengths to make the most of media.

Given the evidence for more granular environments, the research also suggests that we as an industry must collectively consider how best to evolve infrastructure to better reflect the modern media landscape.

CHAPTER

1

Introduction

The media landscape has changed immensely over the past decade. We've seen the shift to mobile, the rise of video, and the introduction of myriad new digital ad formats like feeds, stories, interactive or shoppable posts, in-game ads, and more. These innovations have forever changed how people interact with both content and ads. Looking forward, we can only expect the pace of change to intensify as the role of creators and augmented and virtual reality become a larger and larger part of our online lives.

Despite these changes, today we still use categories to group digital media together, such as "digital video" and "digital display". Those categories may not be the best ways to understand these media in a modern landscape with increased complexity. Moreover, the question of what categories we use to group and understand media is urgent as it is critical to every aspect of advertising including creative development, planning, campaign execution and measurement.

Indeed, the fact that the same ad performs differently in different media environments has been known for a long time for traditional media, but few if any large-scale definitive studies have been published covering the normative effects of the diversity of digital environments. For this reason, Meta, perceiving that such a study is of potential value to the industry, and must be conducted by objective third parties, engaged Realeyes, eye square, and Bill Harvey Consulting to collaborate on the design, execution and analysis of the large-scale experiment reported here.

The objective of the study is to establish if there is evidence for distinct environment types within digital media.

CHAPTER

2 Method
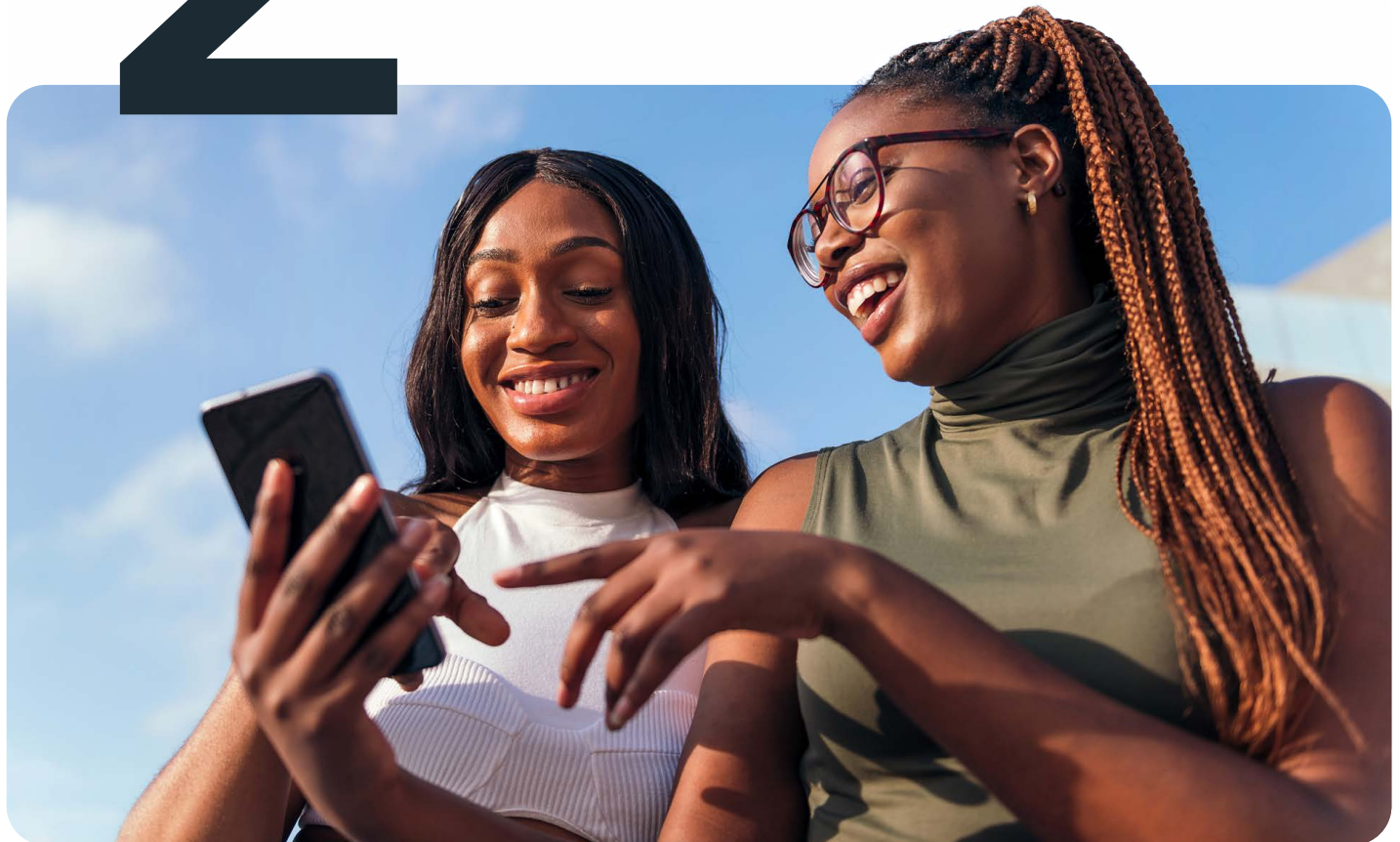
In order to describe and quantify differences across digital media environments, a large scale experiment was designed to expose study participants to ads in fully interactive simulations of digital media apps. The study was scoped to video ads on mobile and the main analysis sample looked across 16,835 ad impressions from 6,076 participants.
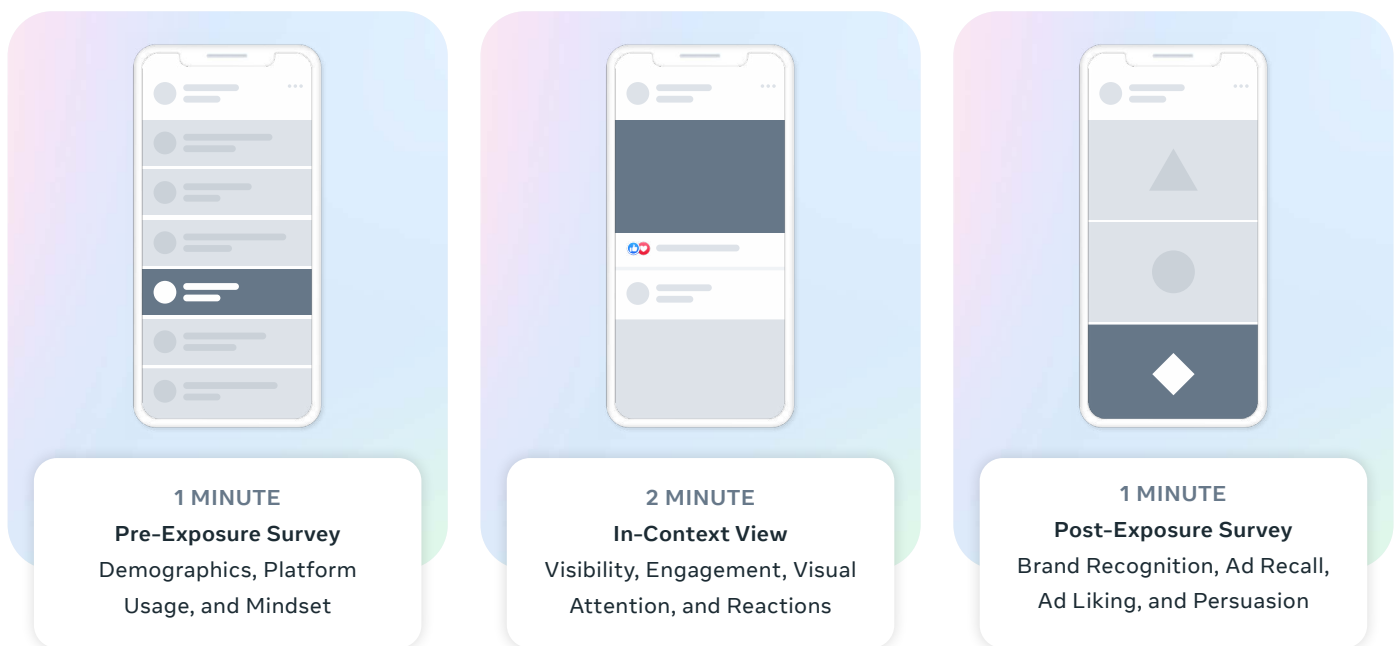
16,835
Ad impressions

6,076
Participants

Participants were randomly assigned to one of 15 different ad placements across 7 different apps: Facebook, Instagram, Hulu, Snapchat, TikTok, Twitter, and YouTube. Participants accessed the simulation through the browser in their mobile. The study set out to measure natural exposure as participants were simply asked to interact with the simulated app for two minutes, on their own smartphone in their own homes or wherever they liked. During the task, data was collected on a suite of ad metrics including engagement (interactions with the ad including clicks, likes, shares, etc.), visibility (seconds where at least 50% of pixels were on screen), visual attention (seconds of attention to the screen while the ad was fully on screen) and facial reaction (measured through facial coding technology). Participants also answered pre-exposure survey questions on demographics and mindset, and post-exposure survey questions on brand and ad metrics. Participants who had never used a particular platform before were excluded from analysis.

Participant Study Flow

1 MINUTE
Pre-Exposure Survey
Demographics, Platform
Usage, and Mindset

2 MINUTE
In-Context View
Visibility, Engagement, Visual
Attention, and Reactions

1 MINUTE
Post-Exposure Survey
Brand Recognition, Ad Recall,
Ad Liking, and Persuasion

Ads in the study were sourced from 5 real brands across different product/service categories, and were adapted where necessary to meet best practices for the placement – so as to hold creative quality constant. Participants saw 1-5 of the test ads depending on ad load and how quickly they moved through the experience, but could only see the same ad once.

In sum, the study was a large split test across ad placements, designed to hold audience, creative and frequency constant.

Note: Meta-commissioned lab study designed and executed by Realeyes in partnership with eye square and Bill Harvey Consulting.

In order to produce insights about broader media environments, each placement was defined as belonging to one of three environment types:

01
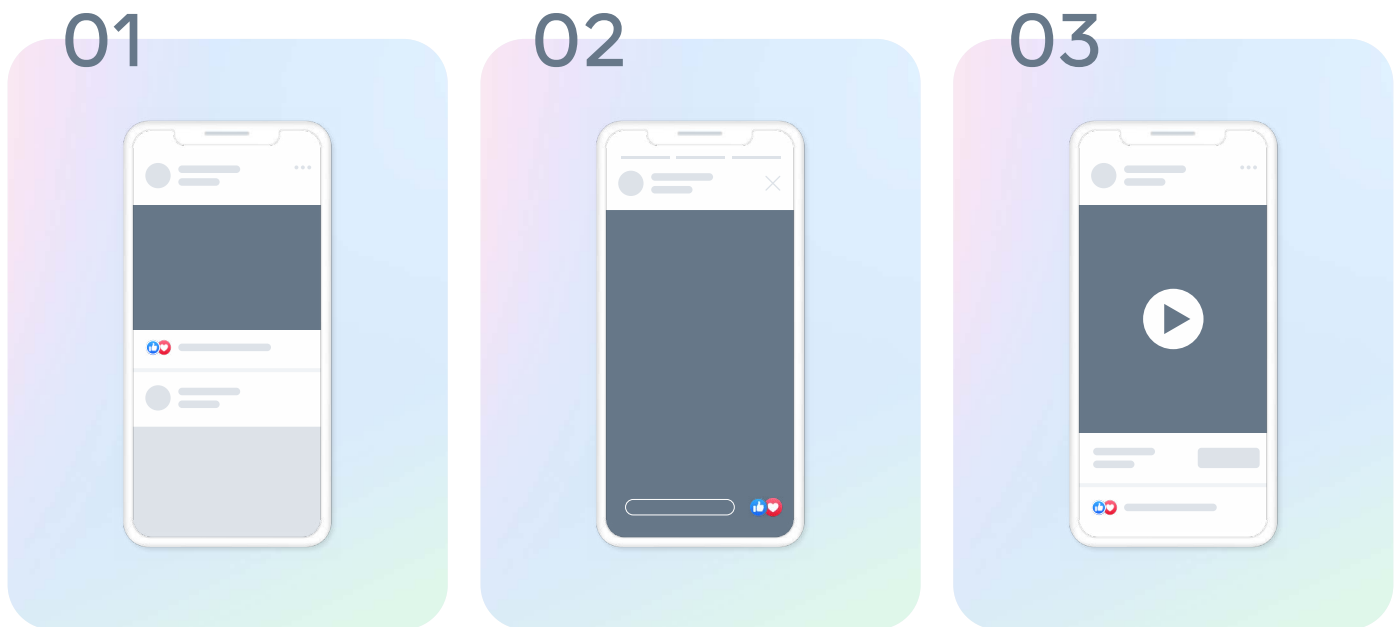
Feed

Vertically scrolling feed with ad units less than full screen and ads in between content.

Placements

- Facebook Feed
- Instagram Feed
- Twitter Feed

02

Short Form

Vertically or horizontally scrolling feed with full screen ads in between content.

Placements

- Facebook Stories
- Instagram Stories
- Instagram Reels
- Snapchat Stories
- TikTok Brand Takeover*
- TikTok Feed
- TikTok TopView*
- YouTube Shorts

03

Stream

Television program or user generated video viewed in online video player with ad appearing before or within the program/video (pre-roll or mid-roll).

Placements

- Facebook InStream*
- Hulu Pre & Mid Roll*
- YouTube Non-skippable*
- YouTube Skippable*

Note: Placements with an asterisk (*) had some or all unskippable time.

CHAPTER

4

Findings

There are different profiles of consumer behavior across environments.

Despite this, the brand outcomes are comparable – suggesting each environment achieves value in a different way.

Attention has a different relationship with outcomes across environments and users, which should inform how the industry uses these metrics.

Marketers should tailor creative to take advantage of how attention typically ebbs and flows over the course of a creative in each environment.
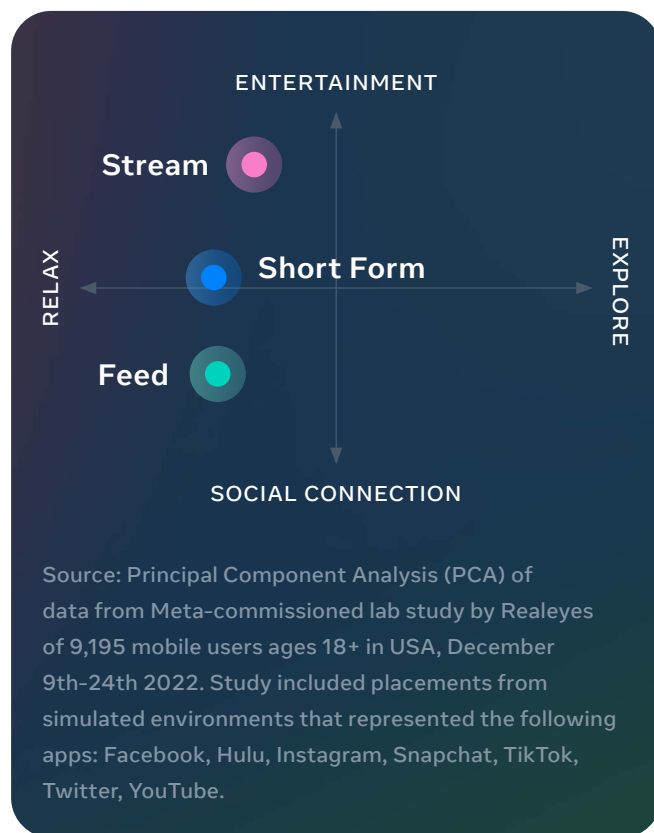
Behavioral norms vary by audience within environment.

1. There are different profiles of consumer behavior across environments.

Analysis of mindset survey data shows that people use different platforms and environments for different reasons. Principal Component Analysis was used to reduce the complexity across the 17 mindset questions, which revealed that reasons for use can be represented on two dimensions: "Explore vs. Relax" and "Entertainment vs. Social Connection". In this conceptual space (figure 1), the average responses for platforms within the three major environment types fell further to the relax side of the spectrum, rather than to explore. On the relaxation side of the scale, stream is used more for entertainment, feed more for social connection, and short form for a combination of both.

Figure 1

ENTERTAINMENT

Stream

RELAX — Short Form — EXPLORE

Feed

SOCIAL CONNECTION

Source: Principal Component Analysis (PCA) of data from Meta-commissioned lab study by Realeyes of 9,195 mobile users ages 18+ in USA, December 9th-24th 2022. Study included placements from simulated environments that represented the following apps: Facebook, Hulu, Instagram, Snapchat, TikTok, Twitter, YouTube.

On the relaxation side of the scale,

stream is used more for entertainment, feed more for social connection, and short form for a combination of both.

When looking at how participants interacted with each environment, it's clear that each digital environment also has its own characteristic behaviors. Figure 2 illustrates that point using three metrics:

1. Engagement
Interactions with the ad including clicks, likes and shares - a device-level measure

2. Visibility
Seconds where at least 50% of pixels were on screen, another device-level measure

3. Attentiveness
Seconds of attention to the screen while the ad was fully on screen, a passively collected human-level measure

Figure 2
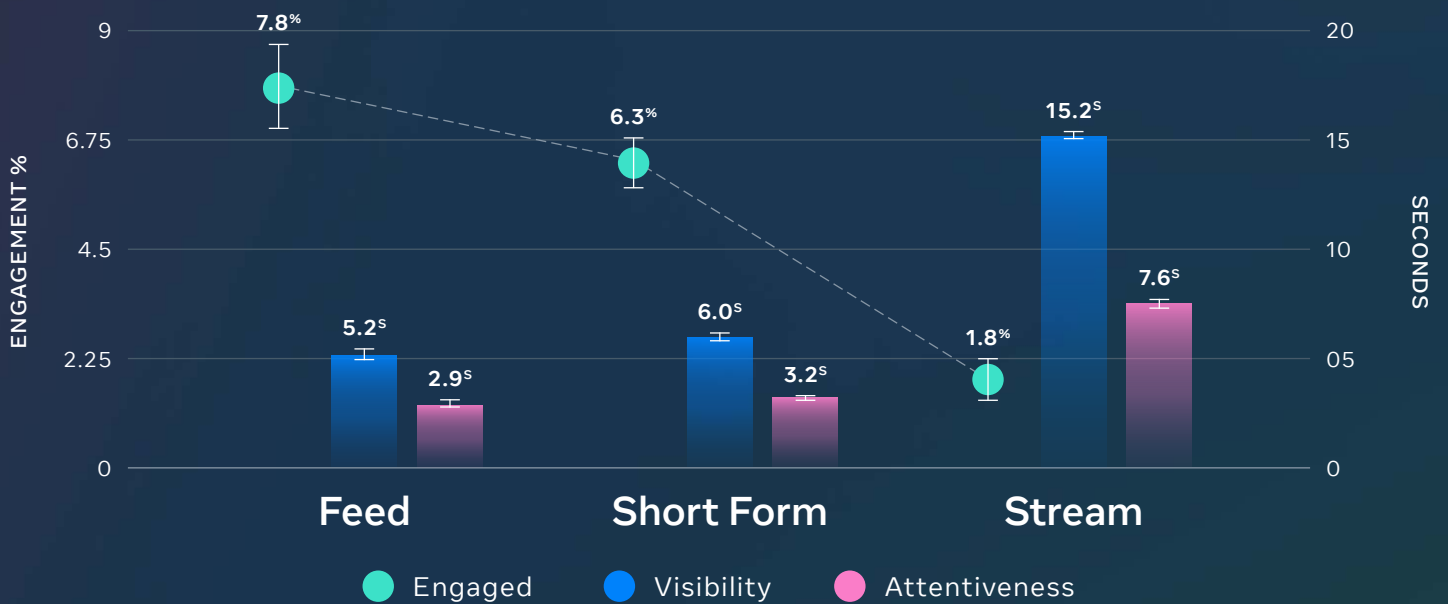
Feed attains the highest levels of such engagement, and stream excels the most in visibility and attentiveness, while short form is in the middle on attentiveness, visibility and engagement.

Source: Analysis of data from Meta-commissioned lab study by Realeyes of 16,835 video ad exposures from 6,076 mobile users ages 18+ in USA, December 9th-24th 2022. Study included placements from simulated environments that represented the following apps: Facebook, Hulu, Instagram, Snapchat, TikTok, Twitter, YouTube.

2. While attention norms vary significantly across environments, brand recognition, on aggregate, is comparable.

Differences in attentive behaviors across environments might lead us to expect differences in brand metrics. However, this is not the case. While stream had the highest visibility, and consequently also highest attentiveness compared to short form or feed, there was no significant differences in average brand recognition across the three environments (figure 3).

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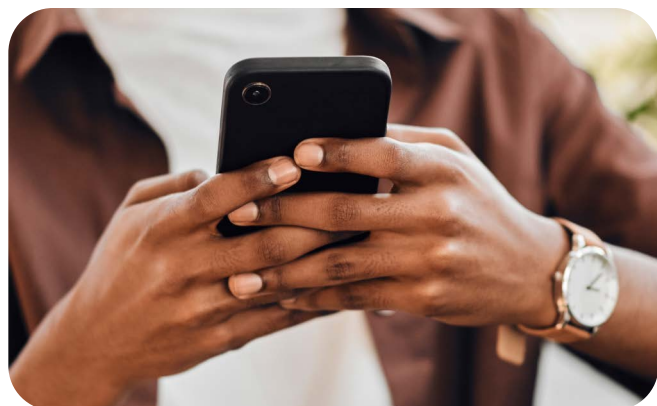
Figure 3

Source: Analysis of data from Meta-commissioned lab study by Realeyes of 16,835 video ad exposures from 6,076 mobile users ages 18+ in USA, December 9th-24th 2022. Study included placements from simulated environments that represented the following apps: Facebook, Hulu, Instagram, Snapchat, TikTok, Twitter, YouTube.
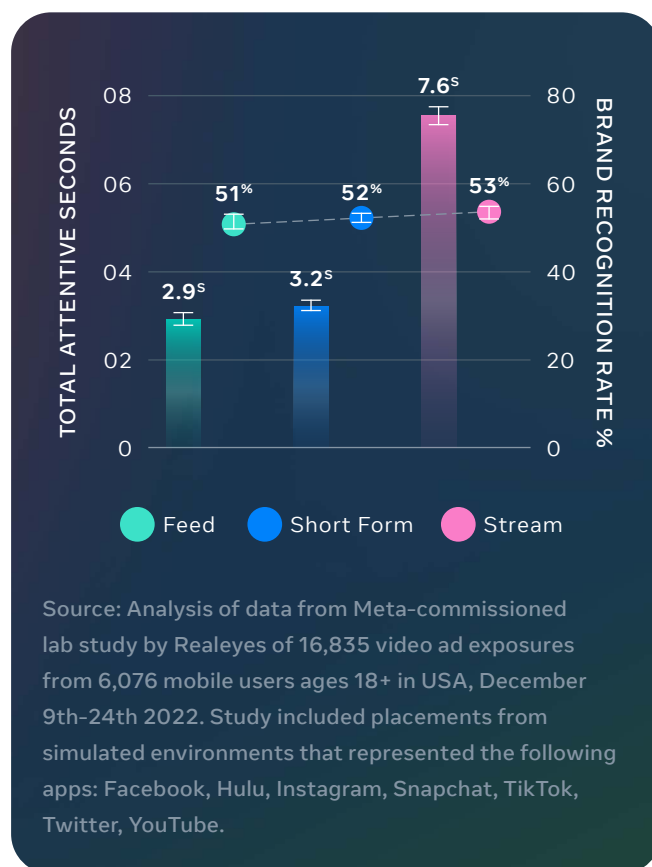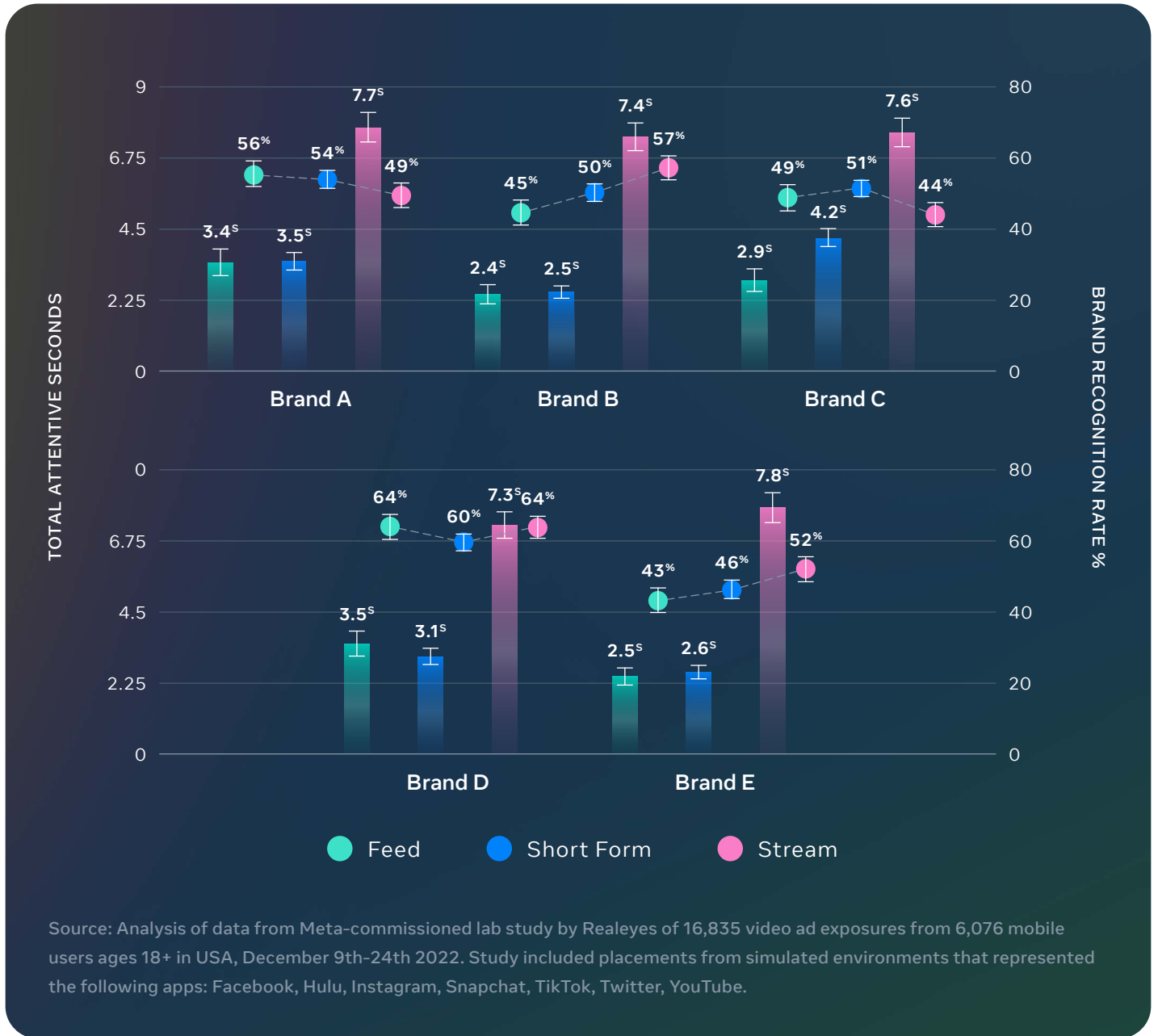
Taken together with the consumer behavior profiles, this implies that each environment achieves brand outcomes for advertisers, but the mechanisms through which advertiser value is created are very different.

Looking at individual brand results (figure 4) supports the finding that brand recognition is similar across environments. While there are some differences in recognition between environments for individual brands, by and large they are not significant, and they are not always the same direction with each of stream, feed and short form performing best in different brand results.

Figure 4

Source: Analysis of data from Meta-commissioned lab study by Realeyes of 16,835 video ad exposures from 6,076 mobile users ages 18+ in USA, December 9th–24th 2022. Study included placements from simulated environments that represented the following apps: Facebook, Hulu, Instagram, Snapchat, TikTok, Twitter, YouTube.

Brand polling results are also similar across environments if we look at different metrics down the funnel. In addition to brand recognition, the study also looked at three other brand outcome metrics (see appendix for more detail on brand polling survey).

Ad recall
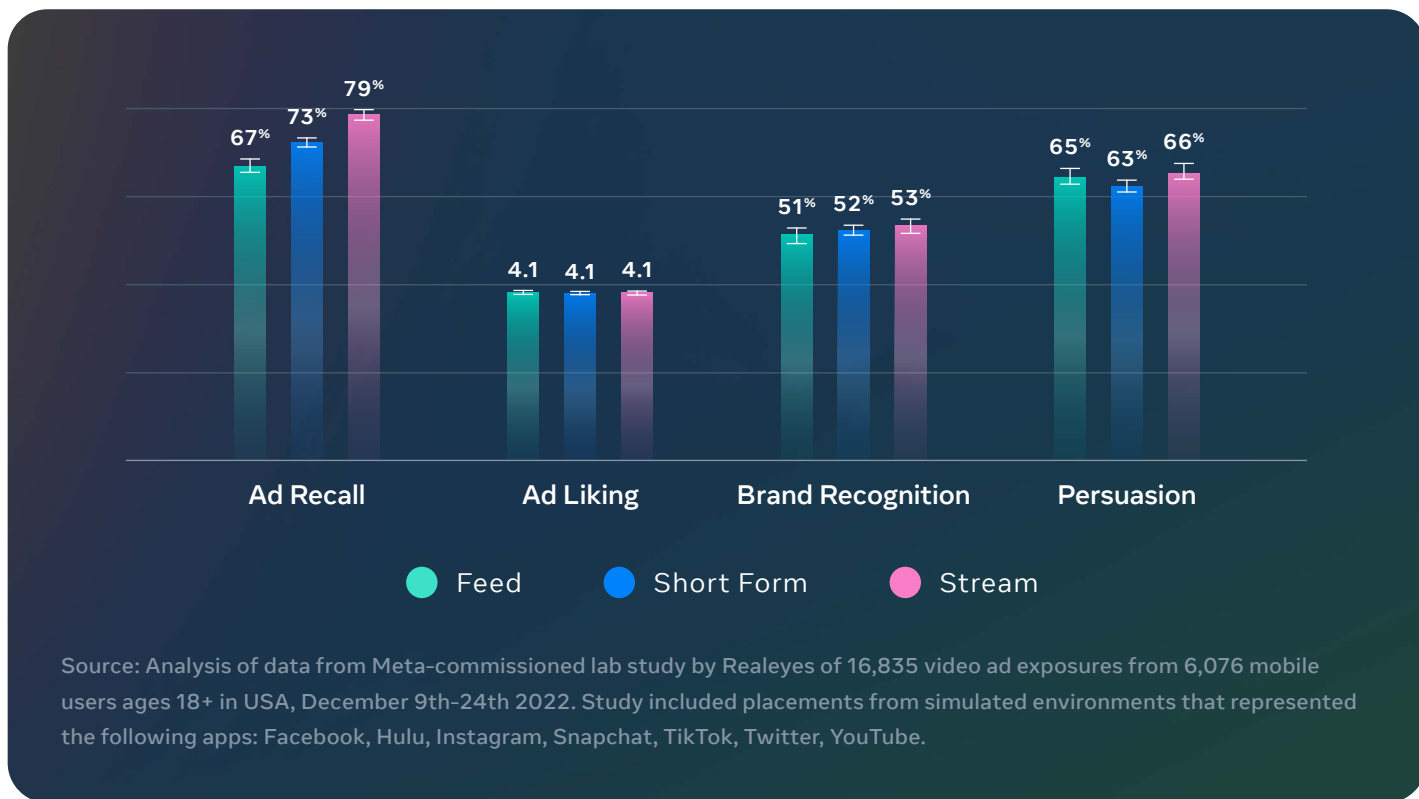Copy/image recall without necessarily remembering the brand.

Ad liking
Which the ARF Copy Testing Validation Study[1] found to be a leading indicator of branding and sales effects.

Persuasion
Long thought to be the measure most predictive of sales.

Figure 5

Ad Recall — Feed 67%, Short Form 73%, Stream 79%
Ad Liking — Feed 4.1, Short Form 4.1, Stream 4.1
Brand Recognition — Feed 51%, Short Form 52%, Stream 53%
Persuasion — Feed 65%, Short Form 63%, Stream 66%

● Feed   ● Short Form   ● Stream

Source: Analysis of data from Meta-commissioned lab study by Realeyes of 16,835 video ad exposures from 6,076 mobile users ages 18+ in USA, December 9th–24th 2022. Study included placements from simulated environments that represented the following apps: Facebook, Hulu, Instagram, Snapchat, TikTok, Twitter, YouTube.

While environments with higher average attention also saw higher ad recall, these differences did not translate down the funnel and the other three measures were all comparable across environments (figure 5).
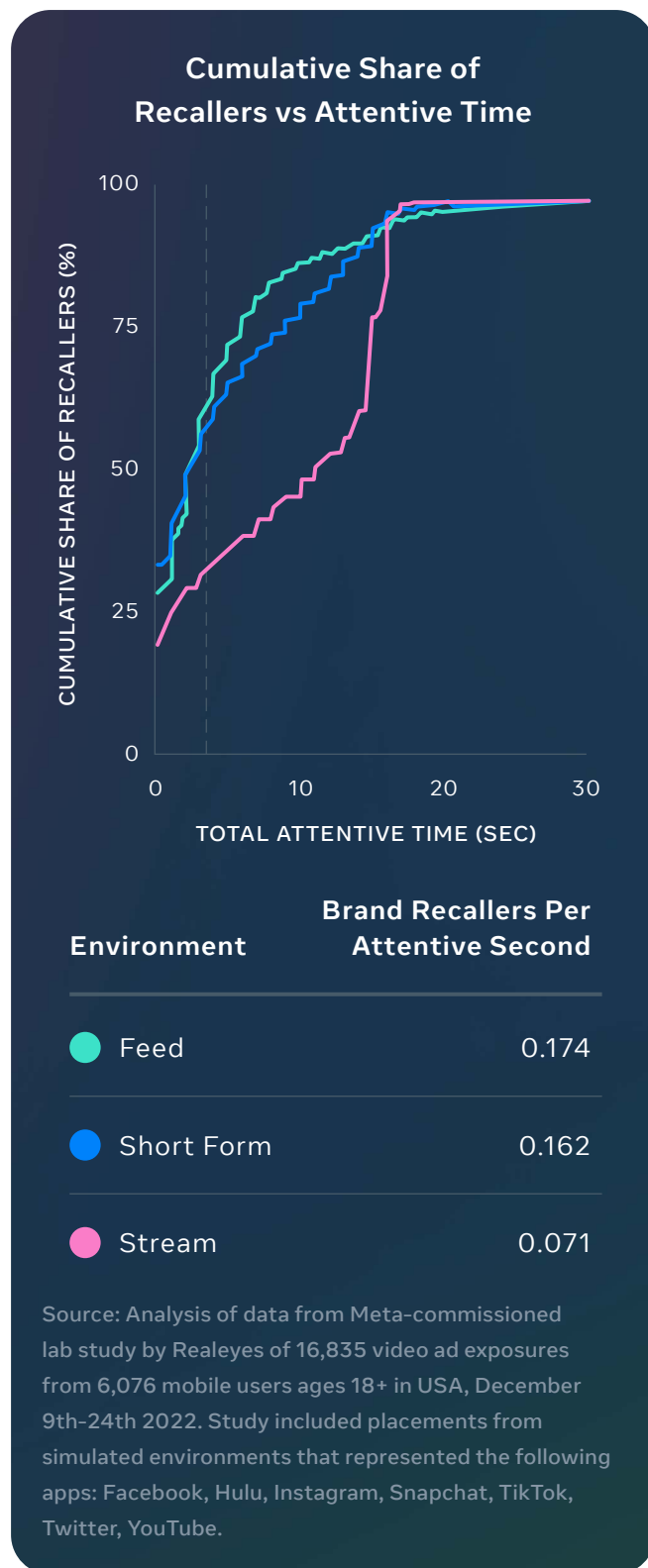
Source: 1. Haley, Russell I. and Allan L. Baldinger. "The ARF Copy Research Validity Project." Journal of Advertising Research 40, no.6 (December 2000). For more detail on definition of brand metrics see technical appendix.

3. Attention has a different relationship with outcomes across environments and users.

What do these findings mean for how we interpret attention metrics across environments?

We established in all environments that attention is correlated with brand recognition, with coefficients of 0.23 for stream, 0.31 for feed and 0.34 for short form. However, looking at recognition by attentive time reveals that the effect of attention on brand outcomes differs across environments. Feed and short form both generate about 0.16-0.17 brand recallers per second of attention, whereas stream produces only about 0.07 brand recallers each second (figure 6 – lower panel). Feed and short form environments also accumulate a higher share of recallers from exposures with short attentive times (figure 6 – upper panel). As a result, stream is less effective on a per second basis but accumulates recallers over longer average attentive times in order to achieve the same level of brand recognition as feed and short form.

Figure 6

Cumulative Share of Recallers vs Attentive Time

Environment	Brand Recallers Per Attentive Second
🟢 Feed	0.174
🔵 Short Form	0.162
🔴 Stream	0.071

Source: Analysis of data from Meta-commissioned lab study by Realeyes of 16,835 video ad exposures from 6,076 mobile users ages 18+ in USA, December 9th-24th 2022. Study included placements from simulated environments that represented the following apps: Facebook, Hulu, Instagram, Snapchat, TikTok, Twitter, YouTube.
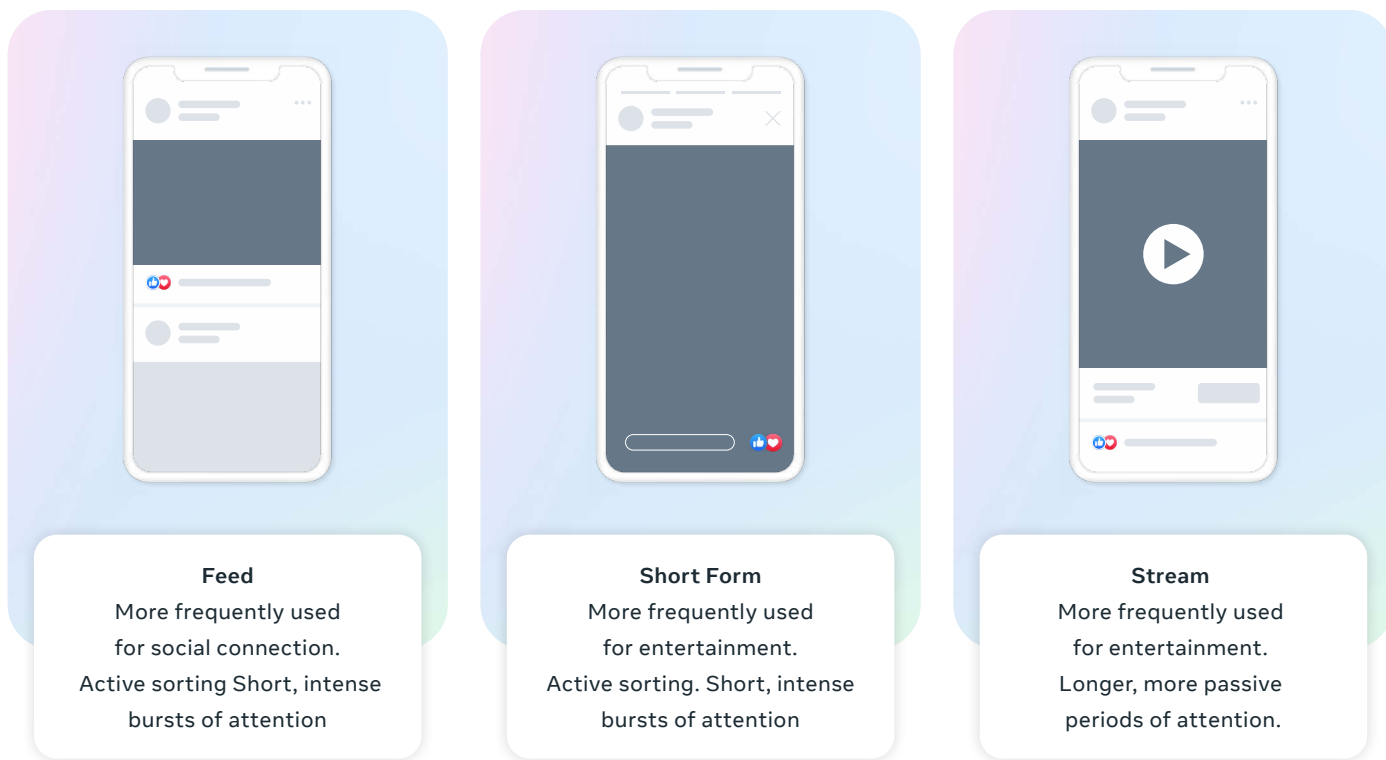
How would one explain why feed and short form are able to do more with less? Neuroscience research has shown that ads seen in scrolling conditions require less time to generate recall than those seen in stationary conditions[2]. Given this, as well as the higher engagement we saw in feed and short form environments, we suggest that the user behavior characteristic of these experiences is "sorting" while scrolling through ads and content: the user is cognitively focused on paying concentrated attention so as to be able to scroll down and decide as quickly as possible, deciding

again and again to reject/pass by items, until something strikes one's fancy. In that heightened state of concentration, fewer seconds of attention would be needed to decide whether or not an item is appealing. This suggests that the *degree* or *nature* of attention is what makes the difference between stream and the other two major digital environment types.

Looking across the analyses in previous figures, we can describe key characteristics of each environment as follows (figure 7).

Figure 7
Descriptive Profiles of Each Environment

Feed
More frequently used
for social connection.
Active sorting Short, intense
bursts of attention

Short Form
More frequently used
for entertainment.
Active sorting. Short, intense
bursts of attention

Stream
More frequently used
for entertainment.
Longer, more passive
periods of attention.

Source: 2. Bordes, Nathalie and Duane Varan. "Seeking the Moment of Ad Impact." Presented ARF ReThink Conference (2016).

4. Marketers should tailor creative to take advantage of different second by second profiles.

Looking at second by second attention profiles (figure 8) can give practitioners valuable insights into both how each environments work, and how to build creative that will take advantage of each environment's strengths.

Figure 8

SHARE OF VIEWS WITH ATTENTION (%)

SECOND OF CREATIVE

● Feed   ● Short Form   ● Stream
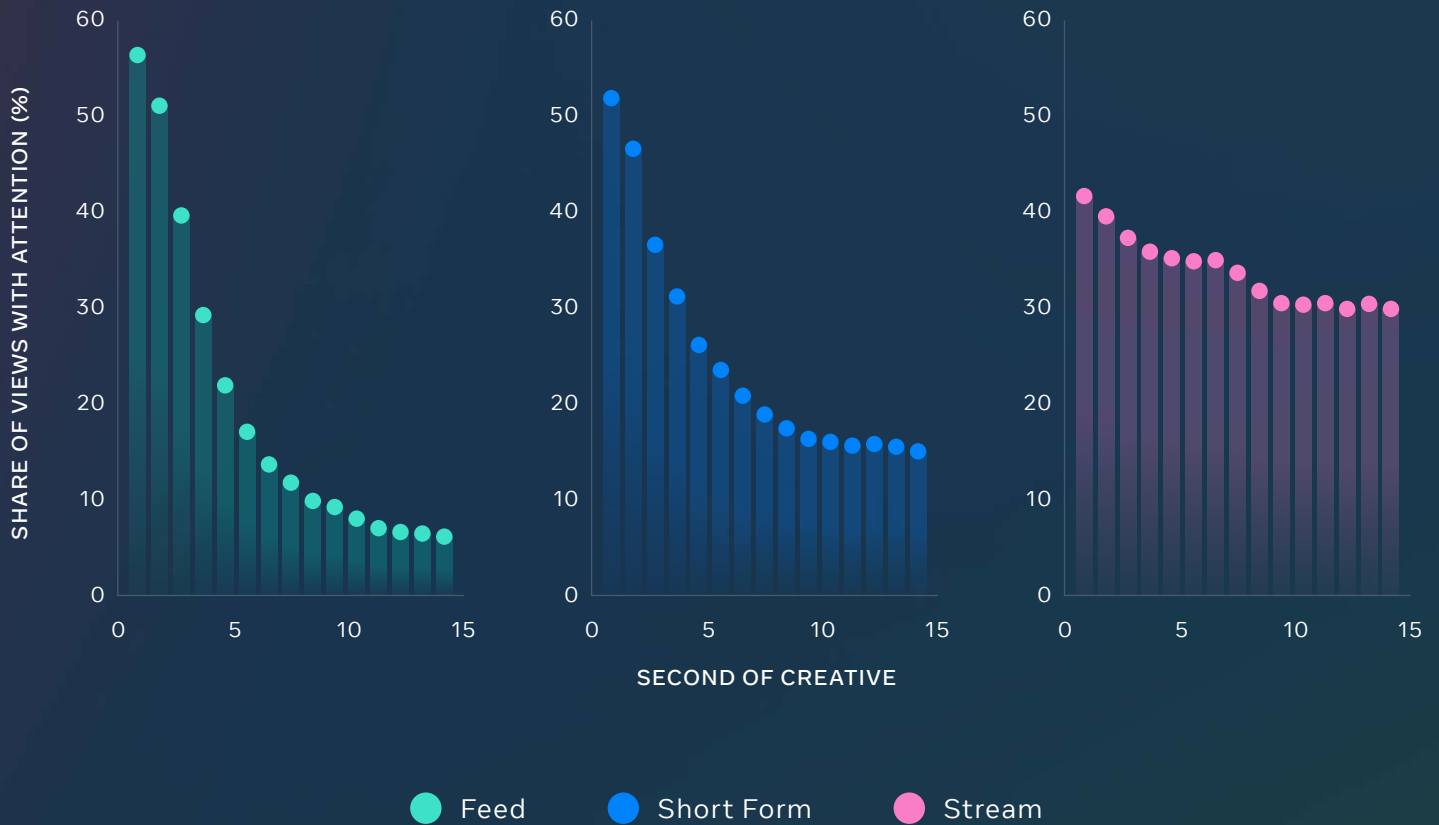
Source: Analysis of data from Meta-commissioned lab study by Realeyes of 13,518 first video ad exposures with any visibility from 6,076 mobile users ages 18+ in USA, December 9th-24th 2022 Study included placements from simulated environments that represented the following apps: Facebook, Hulu, Instagram, Snapchat, TikTok, Twitter, YouTube.

Feed and short form have an intense initial burst of attention, and in this study the brand ads which had the strongest creative branding in those seconds also scored the highest in brand recognition. Having a "first second strategy" for interesting and capturing the viewer is a key requirement to succeed in these environments.

Having a "first second strategy" for interesting the viewer is a key requirement to succeed in [feed and short form] environments.

Stream maintains at least three quarters of its initial attention level through second 15, giving more time for the creative to establish the brand message. However, even during unskippable time, the user may not be paying attention to the ad continuously – for example, looking up and down from the screen or focusing on elements like the skip button . Their eyes may be on the screen but where is their mind? To make the most of this environment, marketers should consider using visual and audio cues to attract the viewer back to the screen during longer passive views characteristic of stream.
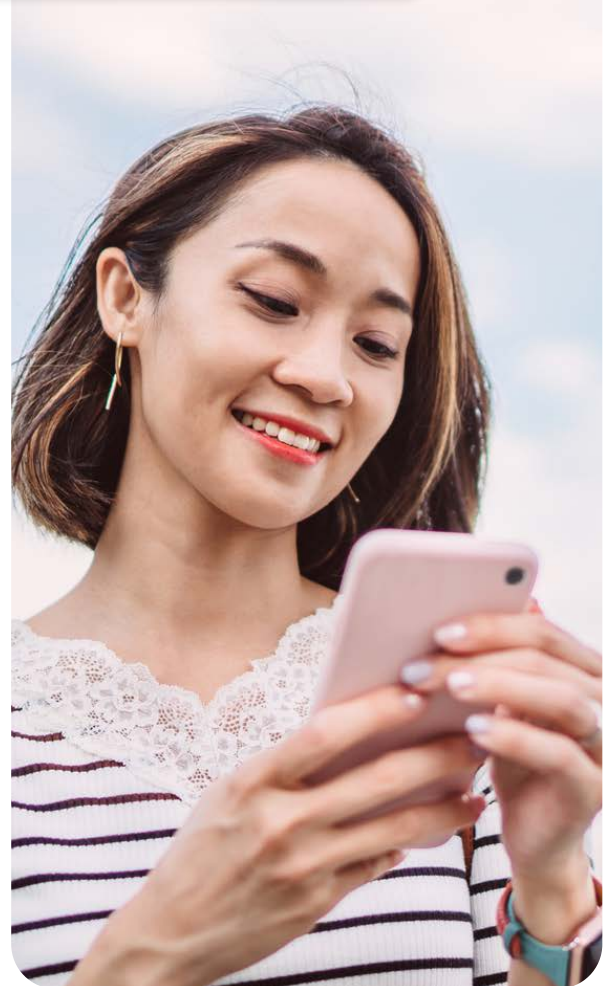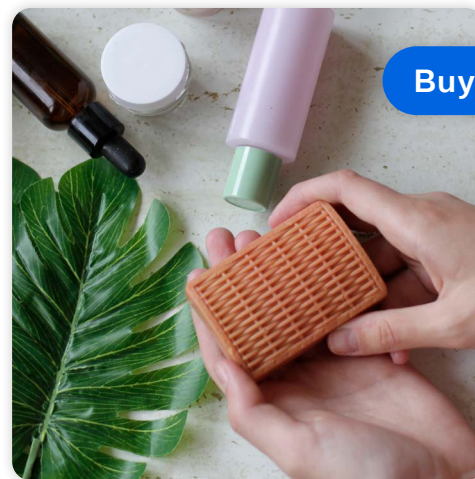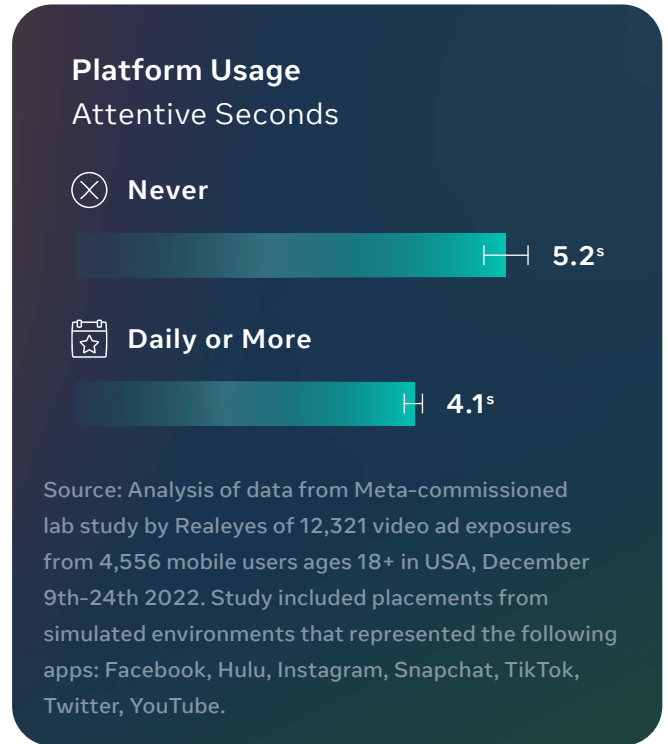
5. Behavior norms vary by audience within environment.

We now know that different digital media environments work very differently. But what do we know about audiences within each environment? We undertook several analyses to understand if there are distinct consumer behaviors within an environment that would be important context for marketers.

First, we compared attention norms between participants who were heavy users of the platform they experienced and participants who had never used the tested platform before (figure 9). Note that the latter group were excluded from all other analyses, but were still included in data collection to support sensitivity analyses.

Figure 9

Platform Usage
Attentive Seconds

⊗ **Never**

5.2ˢ

📅 **Daily or More**

4.1ˢ

Source: Analysis of data from Meta-commissioned lab study by Realeyes of 12,321 video ad exposures from 4,556 mobile users ages 18+ in USA, December 9th-24th 2022. Study included placements from simulated environments that represented the following apps: Facebook, Hulu, Instagram, Snapchat, TikTok, Twitter, YouTube.
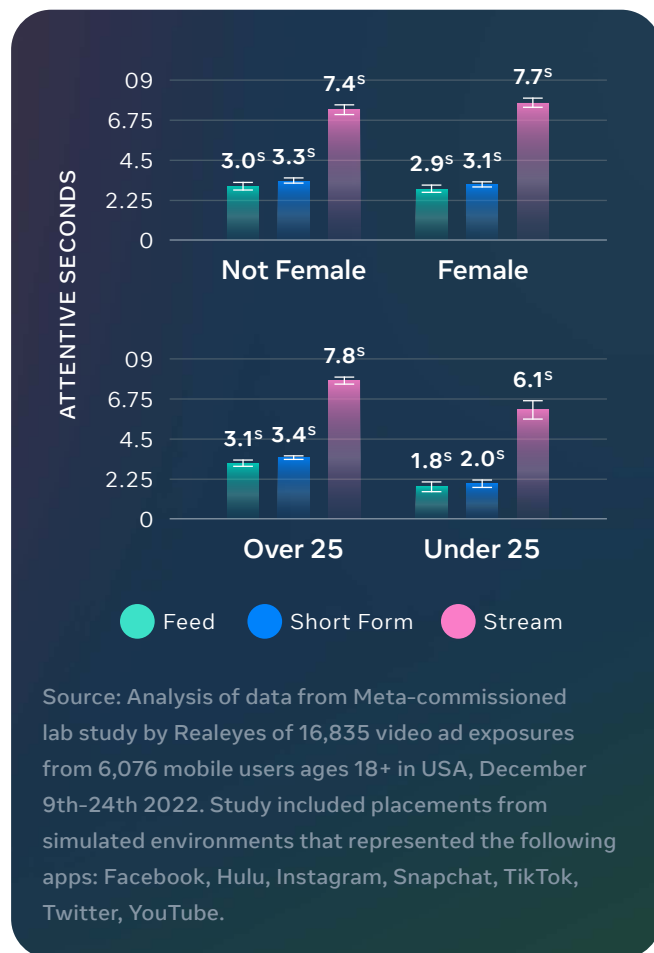
Consumer attentive behavior decreases with increasing familiarity. The methodological decision to exclude from tabulation, respondents providing data on platforms they had never used before, turned out to be wise. Had those "newbies" been included in the findings, they would have inflated the attention levels, probably unevenly across environments, ads, etc. The reason this happens is interesting: until a consumer learns how to navigate a particular environment, there will appear to be more seconds of attention paid per ad. But it will be in effect forced attention, not earned attention.

This highlights that

when we're looking at emergent formats, we should expect behavioral norms to change over time as users develop more familiarity and facility.

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Second, we looked at behavior across common demographic cuts (age and gender) (figure 10). While gender didn't meaningfully affect behavior, age did – with younger audiences interacting more quickly with the environment and showing shorter average view times and attentive times.

Figure 10

Source: Analysis of data from Meta-commissioned lab study by Realeyes of 16,835 video ad exposures from 6,076 mobile users ages 18+ in USA, December 9th-24th 2022. Study included placements from simulated environments that represented the following apps: Facebook, Hulu, Instagram, Snapchat, TikTok, Twitter, YouTube.

This highlights that metrics must be understood relative to the scenario in which they were gathered. For example, two seconds of attention may be high in one environment or with one audience, and low in another.

6 Outstanding research questions

The topic of environments and attention is incredibly complex, and this analysis identified a number of questions that need further work to come to a definitive answer.

First, the causal impact of attention on recall can't be directly measured in a naturalistic lab study. This is because when participants

Existing Brand Awareness

Attention

Brand Recognition

select the amount of attention they give to an ad or content, there are other factors at play that may affect both the choice of attentive time and also recall. For example, participants with existing awareness of the brand may be more likely both to attend to the ad, and to recall the brand. There are many other audience factors that are more difficult to identify and control for, but that confound the relationship.

However, measuring naturalistic behavior is incredibly important for research to reflect the real world. As a result, the relationship we measure in this study is a correlation, not a causal relationship, and is likely the combination of the effect of attention on recall and other audience effects driving both attention and recall. While modeling can help disentangle the two, it's a thorny problem for attention research and will require additional work by researchers across the industry to come to a robust answer.
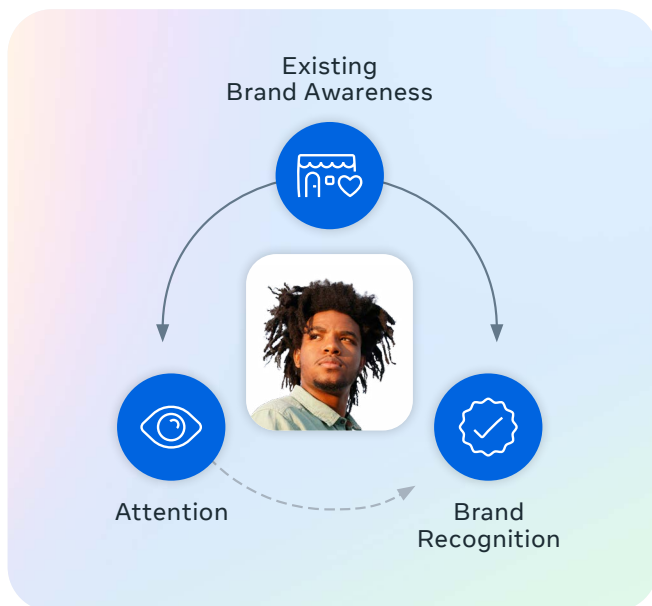
Second, one key difference between the environments that we studied was the amount of unskippable or forced time associated with placements. We suspect that some combinations of environment and placements are more likely to generate a fervent desire to escape ad interruptions as fast as possible, which will thus generate forced attention. Thus, we may find a higher percentage of forced attention and distraction (eyes off screen) in environments that force the ad into view and delay or complicate the ability to skip the ad.

Defining forced time vs. earned time, however, was complicated and beyond the scope of this study. While the amount of skippable and unskippable time in a format can provide a simple proxy, this doesn't account for the fact that users may voluntarily be attending to the creative during unskippable time, or may be attempting to navigate the environment instead of attending to the creative during skippable time.

In our exploration of this question, we looked at several different definitions of forced time, ranging from simple definitions of unskippable time to more complex modeled approaches. These directional analyses confirmed that each environment has a different ratio of forced to earned time, with stream having the highest amount of forced time and feed having the highest amount of earned time. However, more research is needed to come up with a robust definition – potentially also incorporating more signals than were measured in this project, for example, identifying attention to specific interface elements like the skip button.

Handcrafted Vase
45.99
Shop Now
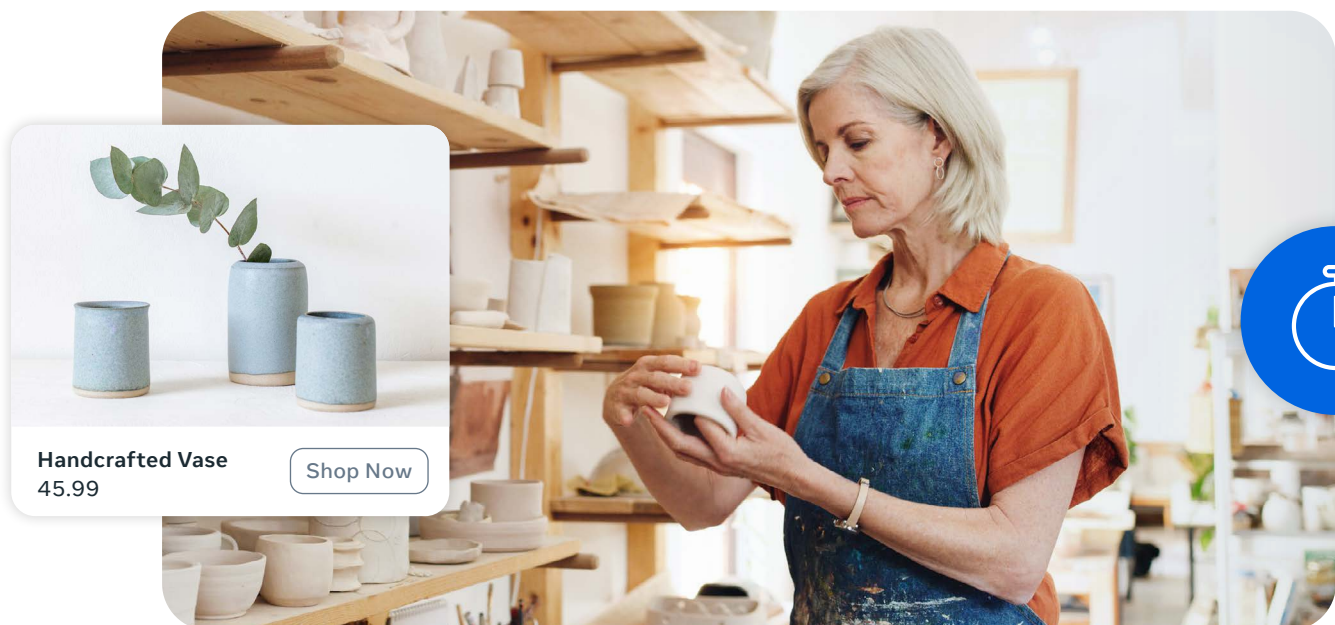
CHAPTER

7

Discussion and Implications

The digital media environments feed, short form and stream confer a strong influence on the outcomes of an ad. This reflects the nature of the user who approaches digital media environments with different use cases that are reflected in how the user consumes information. Users in feed and short form environments are actively sorting through content while seeking more social connection. This effect is reduced for stream but (we would hypothesize) still present as a backdrop if the user in the same session is also switching among all three types. As a result, duration of attention should not be compared across the three types, but it can provide useful insights to practitioners when compared *within* any one type – for example, comparing a campaign's attention results to benchmarks or norms for the same audience and placements. Indeed, understanding attention relative to the environment and

audience where it was measured is critical to appropriately interpret and implement these metrics.

Although the relationship between attention and brand outcomes is different between the three broadest environment types, this does not indicate that attention is unimportant. Attention is a necessary though insufficient requirement for advertising to produce virtually all sales. Advertisers should introduce the brand most memorably in the first two seconds of feed and short form digital video. Audio and visual signals combined in the first two seconds, in one of the test ads, had the highest brand recognition. Knowing the mindsets most common for regular users of a platform, one can create ads for that platform which aim to reward those mindsets.

All of the digital environments tested show useful degrees of advertising effectiveness, especially for brand recognition. We believe that these strong brand results may be a result of the focused attention required for making speedy decisions about what to look at. However, this study highlighted, the contribution of attention to performance is complex and not always direct: the total amount of eyes on screen matters less that what quality of attention is spent at critical moments of the ad, which is influenced by environment effects too.

The total amount of eyes on screen matters less that what quality of attention is spend at critical moments of the ad, which is influenced by environment effects too.

Because all digital environments are able to achieve advertising effectiveness goals, the best strategy would be to use all available digital media studied, rather than to choose among them. While allocations need not be assumed to be equalized in an optimal solution, digital environments involve

different mindsets and emotions, so can create synergies when used together. The Advertising Research Foundation (ARF) came to the same conclusion from their global meta-analysis of about five thousand ROI studies: brand use of more media types is correlated with higher ROI.[3]

In any case, brands are achieving greater success using attention metrics to better understand their media through descriptive insights about consumer behavior. That activity can be expanded upon in a variety of ways. First, the use of attention metrics in creative testing can help identify if the message suits the environment – a prerequisite for success. Second, brands who are interested in using attention as a proxy for outcomes should test and learn to determine if attention is a useful predictor in the context of their campaigns – validating against metrics including incremental sales lifts as measured by random control trial experiments. Given that consumer behavior is complex, brands can consider combining multiple signals into a cocktail of metrics in their search for a metric that is strongly predictive of desired outcomes. Few would argue that it would be better to simply use CPM impressions against the target and ignore the effects of environments, when the latter approach is known to result in excessive frequency, and lower sales and branding results.

Source: 3. ARF. "The Advertising Research Foundation Reveals Groundbreaking Research: How Advertising Works Today." March 23, 2016. Fuguitt, Gayle, "How Advertising Works, Today." Presented at ARF member event (2016).

The overarching purpose of this study was in search of empirical evidence of distinct environments within digital media. Indeed, we did find distinctions between feed, short form, and stream, because of the sharp behavioral and mindset differences between them. This is reflected in the distinct attention vs. outcome curves characteristic of each environment.

While we have confirmed that more granular categories are needed, more work is necessary to understand whether we should think of media as belonging to these three environments, or if other dimensions – for example, ad forcing or presence of scrolling – suggest a slightly different taxonomy.

Insights

01 There are distinct environment types within digital media – but more work is needed to identify the most meaningful categorization.

02 While profiles of consumer behavior and proportion of skippable time differ across environments, brand recognition is similar.

03 Attention should not be compared across environments, but it can provide useful insights when compared within an environment. The total amount of eyes on screen matters less than what quality of attention is spent at critical moments of the ad.

Next Steps for Marketers

» **Reflect on mental models for the media landscape.** Be aware of how media is categorized by your organization, and by systems or data your organization uses. Consider where these definitions work and where they cause blind spots.

» **Match creative to environment to best leverage each environment's unique strengths.** For feed and short form, take advantage of initial bursts of attention by introducing the brand in the first few seconds. For stream environments, leverage audio and video cues to hold attention during longer views.

» **Test and learn to understand the value of attention in each environment.** Validate against outcomes including incremental sales lift. Consider using norms or benchmarks to understand if attention is high or low relative to the same placements and audiences.

CHAPTER

8

Technical Appendix

Simulated Environments

Platforms included in the study were: Meta (Facebook, Instagram), Hulu, Snapchat, TikTok, Twitter, and YouTube. For each platform, all placements for which eye square had an available simulated environment were included. No custom modifications were made to the environments for this study. For placements with ad load greater than a single ad, test ads appeared in randomized order.

Characteristics of each simulated placement and tested creative were as follows. Creatives were sourced from 5 partner brands and vetted by a creative agency, VidMob, to ensure minimum creative best practices were applied for each placement.

PLATFORM	PLACEMENT	LENGTH OF TESTED CREATIVE (SEC)	ASPECT RATIO	UNSKIPPABLE TIME (SEC)
FACEBOOK	Feed	6-15	1:1	—
	Stories	10-15	9:16	—
	InStream	6-15	1:1	15
INSTAGRAM	Feed	6-15	1:1	—
	Stories	10-15	9:16	—
	Reels	10-15	9:16	—
HULU	Pre and Mid Roll	15	16:9	15
SNAPCHAT	Stories	10-15	9:16	—
TIKTOK	Feed	10-15	9:16	—
	Brand Takeover	10-15	9:16	3
	Top View	10-15	9:16	3
TWITTER	Feed	6-15	1:1	—
YOUTUBE	Non-Skippable	15	16:9	15
	Skippable	15	16:9	5
	Shorts	10-15	9:16	—

For placements with ad load greater than a single ad, test ads appeared in randomized order. Content was sourced by eye square from public accounts and each piece of content was less than 2 weeks old at the time of the test. Accounts were screened for risky content according to the GARM framework. Study participants scored the environment on authenticity after completing the task and all environments scored 87% or higher.

Recruitment and Sample Size

The study was fielded December 14-24, 2022 in United States, on mobile only, including both iOS and Android. Participants were recruited through Realeyes panel partners and met the following requirements:

- US census 18+
- Mobile users
- Must have a webcam and be willing to use it for the study.

Panel providers adhered to European Society of Opinion and Market Research (ESOMAR) best practices for recruitment.

The analysis sample excluded participants who had never used the platform to which they were exposed. The analysis sample size for each placement was as follows:

PLATFORM	PLACEMENT	PARTICIPANTS	AD EXPOSURES[4]
FACEBOOK	Feed	484	2183
	Stories	455	1269
	InStream	457	457
INSTAGRAM	Feed	369	1337
	Stories	383	888
	Reels	375	1734
HULU	Pre and Mid Roll	398	1726
SNAPCHAT	Stories	314	314
TIKTOK	Feed	370	1747
	Brand Takeover	354	354
	Top View	318	318
TWITTER	Feed	303	303
YOUTUBE	Non-Skippable	518	1157
	Skippable	525	948
	Shorts	453	2100

4. Across all environments, ads were inserted in ad slots starting at the beginning of the session. Due to technical limitations, only one ad exposure was served to participants in Twitter Feed and Snapchat Stories test cells.

Attention Measurement

To perform attention measurement, Realeyes deployed its most recent technology at the time of the study, which uses a deep learning neural network trained on a large quantity of annotated webcam recordings to detect eyes-on screen. Head movements, gaze movements as well as some additional behavioral cues that indicate a lower level of attention are all leveraged by the model to predict attention. The technology itself uses face detection and tracking before passing transformed data to the neural network for predictions. Predictions are made for every single webcam frame in which faces are detected, and resampled at a fixed frame-per-second rate (100ms steps) before being further aggregated second-by-second to indicate if any attention was present within the second. Attention measurements are scored on predicted accuracy and respondents that do not pass accuracy thresholds are excluded from analysis and do not count towards recruiting targets.

In this study we required for a video ad to have 100% of its pixels visible to consider that eyes-on screen was attributable to the target ad.

Survey

Survey metrics reported above were collected using the following survey questions.

1. **Platform Usage (pre-exposure):** How Often do you use this social media platform?

   ☐ Never
   ☐ I have an account but rarely use it
   ☐ Occasionally
   ☐ Few times a week
   ☐ Nearly every day or more

2. **Platform Mindset (pre-exposure):** What do you use this social media platform for? (Check as many as apply)

   ☐ Express myself
   ☐ Check on friends and relatives
   ☐ Communicate
   ☐ Advance my career
   ☐ Kill time
   ☐ Escape worries
   ☐ Be entertained with low effort
   ☐ Learn things
   ☐ See attractive humans
   ☐ See cute animals
   ☐ See things I've never seen
   ☐ Check on the latest controversies
   ☐ Get a laugh
   ☐ Relax
   ☐ Keep up on things
   ☐ Not miss out on anything
   ☐ Other

3. **Brand Recognition (post-exposure):** Have you seen an ad for any of the following brands during this test? Please click any brand logo you remember viewing an ad from in the last few minutes.

   Clickable list of 12 brand logos, with randomized position in the list.

4. **Ad Recall (post-exposure, asked once for each exposed creative):** Do you recall seeing the following advertisement?

   Brand name and representative thumbnail of ad shown

5. **Ad Liking (post-exposure, asked once for each creative):**

   From 1 to 5, how much did you enjoy watching this ad?

6. **Persuasion (post-exposure):** Did this ad change the way you feel about this brand in any way?

   ☐ Yes, positively
   ☐ Yes, negatively
   ☐ No