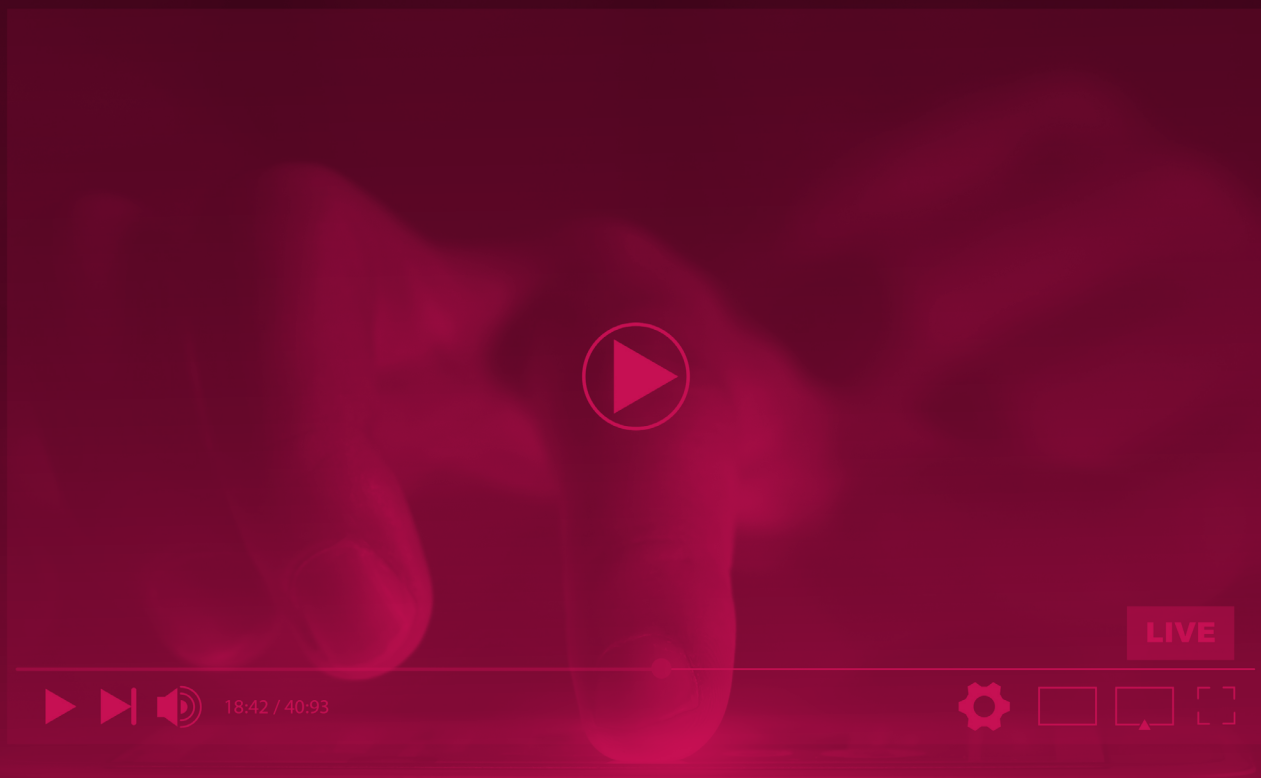


## Investigation 4

# Spanish-Language News Consumers

Cooper Gatewood





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## Executive Summary & Key Findings

The final investigation in this series examining aspects of YouTube's recommendation algorithm explored how content was recommended to users with a primary interest in Spanish-language news. Additionally, ISD analysts sought to understand whether slight variations in the type of content watched by users would result in significant differences in the videos recommended.

Both accounts watched the same Spanish-language news content for the same amount of time for four out of five days. On one of the days, one account (the fringe account) watched content from a popular Spanish-language conspiratorial channel, while the other (the mainstream account) watched a video from a Spanish-language lifestyle vlogger.

As in previous investigations, the most frequently recommended content to both accounts was related to their primary interest – Spanish-language news. Interestingly, while conspiratorial content was recommended to the fringe account, it was recommended at a lower rate than vlogger content was recommended to the mainstream account. This is a positive finding, although one that requires further transparency and research to understand.

- The vast majority of the most frequently recommended videos to both the mainstream and fringe accounts were related to their primary interest: Spanish-language news content.
  - Notably, for the fringe profile that viewed some conspiracy content, the algorithm did recommend some conspiracy videos. However, this effect was limited: while 10% of videos recommended more than once to the fringe account were conspiracy-related (the account's secondary interest), this was lower than the >30% of videos recommended more than once to the mainstream account which related to this account's secondary interest (vloggers).
  - Although a large percentage of the videos recommended to the accounts were unique (recommended to one and not the other), the content of the videos was largely similar. There were some minor if notable differences in categories like religion (recommended more to the mainstream account) and weapons (recommended more to the fringe account). Further research is needed to understand these differences.
  - While videos were largely similar, ads were substantially different, with the fringe account receiving more ads for social media and education.
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## Project Overview and Methodology

As of 2020, about a quarter of adults in the US get their news from YouTube.<sup>1</sup> Moreover, roughly a quarter of US adults consulting YouTube for news are Hispanic.<sup>2</sup> Given the role of YouTube in the spread of news, it is important to understand how the platform's recommendation algorithm can influence the news content individual users are exposed to. This is even more crucial in the context of Spanish-speaking populations and their information habits, given research showing that Spanish-speaking Americans have been in some instances overlooked or disadvantaged by algorithms on Google platforms.<sup>3</sup>

To better understand this, ISD created two new YouTube accounts for 35-year-old men located in Florida. The

personas of these accounts were designed to have an interest in Spanish-language news videos. Both accounts watched the same content, except on one day – where one account watched conspiratorial content and the other general entertainment (e.g. a video from a lifestyle influencer).

The Spanish-language personas primarily watched content from top news channels in Spanish, namely Univision Noticias, Telemundo and CNN Español. These channels had the highest subscriber numbers among Spanish-language news channels at the time of data collection. To vary the accounts, the mainstream persona watched a video from Lele Pons, a popular vlogger and influencer with wide viewership, while the fringe persona

**Figure 1:** Persona-building process for Spanish-language news accounts – note that both accounts watched the same content, except on day four.

### Content/Channels watched by Spanish-language news persona (% of total watch time)

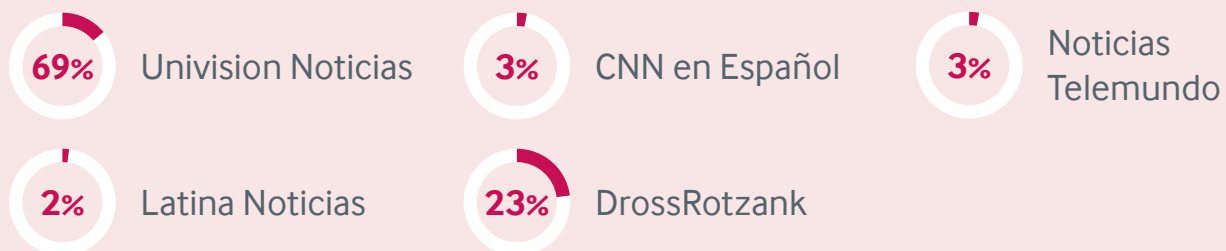
Day 1 (16 min watch time)	Search for Univision Noticias	Subscribe to channel	Watch last uploaded video
Day 2 (29 min watch time)	Search for noticias latinas EEUU	Watch first video in results	
Day 3 (12 min watch time)	Search for CNN Español	Subscribe to channel	Watch last uploaded video
Day 4 (Fringe) (21 min watch time)	Search for DrossRotzank	Watch first video in results	
Day 4 (Mainstream) (21 min watch time)	Search for Lele Pons	Watch first video in results	
Day 5 (17 minute watch time)	Search for Telemundo	Subscribe to channel	Watch last uploaded video

Figure 2: Content watched by Spanish-language news personas

### Content/channels watched by “mainstream” Spanish-language news account



### Content/channels watched by “fringe” Spanish-language news account



watched a video from DrossRotzank, a Spanish-language channel with relatively high viewership that often shares conspiracy content.

After the fifth day of persona building, a browser automation tool was used to record the recommendations displayed on the homepage of each account every six hours for one month. The coding guidelines below were used to code all videos that were recommended more than once to each account and unique videos (i.e. videos recommended to one account, but not the other). Analysis was also conducted on the number of videos recommended to each account and on the ads shown to each account.

#### Coding guideline

- Videos from channels to which the persona subscribed were coded as **subscribed**.
- Videos were labeled as **watched** if the video came from an account that was previously watched (but not subscribed to).

- **Closely related** videos were those whose contents were closely related to videos the persona had watched. For both channels, this included news videos from affiliates of watched and subscribed channels.
- **Subject related** videos were those that related to the subjects watched by each persona, such as other types of news contents. For the fringe persona, this also included videos related to paranormal or conspiracy theories, and for the mainstream persona, this included similar vlogger content.
- Finally, videos coded as **unrelated** were those that did not fall into the above categories.

# Results

**Table 1:** Differences in the numbers of videos and ads recommended to the mainstream and fringe accounts.

	Mainstream account	Fringe account
Total no of videos	595	482
Total no of ads	12	24
Videos recommended at least twice	89	100
Unique videos	471	359

## Number of videos/ads recommended to each account

As in previous investigations in this series, there were differences in the numbers of videos and ads recommended to each account, even though data was collected for the same amount of time.

In this case, the mainstream account was recommended 113 more videos than the fringe account and double the number of ads. This difference is significantly larger than the differences seen in the first two investigations in this series (where the accounts' gender and age were varied, but where both accounts watched identical content), but is in line with the differences seen in the Mommy vlogger investigation, where the accounts watched different content. This indicates that differences in the kind of content watched by the accounts influence the number of video and ad recommendations shown to users.

## Videos recommended to each account at least twice

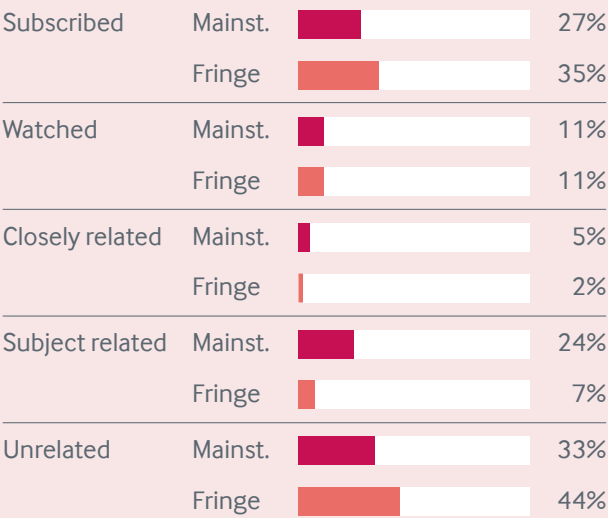
Among videos recommended to each account more than once, the fringe account received more recommendations from subscribed, watched and unrelated channels, and fewer closely related and subject related videos. Meanwhile, the mainstream account was served more closely related and subject related videos, particularly vlogger videos, as shown in Figure 3.

For both accounts, as in all investigations in this series, the majority of the most frequently recommended content to both accounts was related to the content or subject matter they previously watched (67% for the mainstream account, 55% for the fringe account).

Qualitative analysis of the videos recommended at least twice to each account also shows that recommendations

**Figure 3:** Categories of videos recommended to each account at least twice.

## Category of videos shown at least twice to each account



largely aligned with the accounts' demonstrated interests. Both accounts were recommended roughly the same number of news videos (with a margin of 3), but the mainstream account received many more recommendations for vlogger content (27 compared to 10 for the fringe account).

Unsurprisingly, the fringe account received more conspiracy recommendations (12 videos, compared to none for the mainstream account), though all conspiracy recommendations came from a channel the fringe account had watched (i.e. DrossRotzank). Both accounts received comparable numbers of recommendations from other categories, primarily TV and music. Full analysis can be found in the Appendix, in Table 16a.

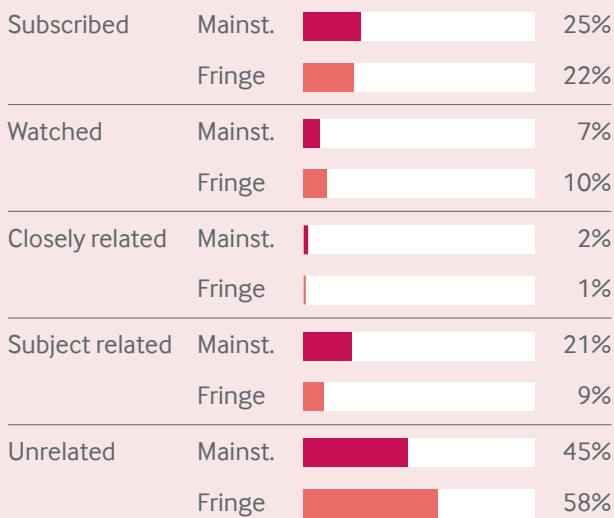
## Unique videos recommended to each account

An analysis of the unique videos recommended to each account shows that the mainstream account was recommended 471 unique videos (79% of the total videos), while 359 unique videos were recommended to the fringe account (74% of the total). The pattern seen above, where the fringe account saw a proportionately



**Figure 4:** Categories of unique videos recommended to each account.

### Category of videos shown at least twice to each account



larger number of unrelated videos than the mainstream account, repeats when looking at only videos recommended to one or the other account.

As seen in Table 5a in the Appendix, which details the subcategory breakdown for unique videos, there were a number of disparities between the two accounts. Some of these differences can be easily explained by the differences in content viewed by the two accounts. For example, the mainstream account received much more vlogger content, which may be explained in part by its views of vloggers like Lele Pons and Juan de Dios Pantoja.

However, there was not a clear converse spike in the paranormal and paranormal fiction subcategories for the fringe account. The paranormal subcategory contained videos about supposed first-person accounts of paranormal activity, while the paranormal fiction subcategory contained illustrated stories of encounters with the paranormal, though they appeared to be intended as fiction. While the fringe account was recommended more of these videos than the mainstream account, there were far fewer of this type of video relative to the

large number of vlogger videos recommended to the mainstream account.

Other discrepancies are less easy to interpret. For instance, both accounts received recommendations related to health, religion, and nature. While the fringe account was recommended roughly equal numbers of videos from each subcategory, the mainstream account was recommended many more videos from the religion subcategory. In both cases, this content was overwhelmingly related to evangelical Christianity, and it is not clear why this would be more relevant for the mainstream account than the fringe one.

Similarly, the mainstream account received more than twice as many recommendations for educational videos, which largely focus on English-language education (for both accounts). In contrast, the fringe account received roughly 50% more recommendations for meditation and relaxation videos.

Finally, an interesting difference, though it is a small one, is that the fringe account was recommended one video focusing on weapons (in this case, handguns). The fringe account was also recommended more history videos than the mainstream account, one of which focused on military airplanes. This could be due in part to two of the news videos watched by the account relating to reports of UFOs from the US military. However, the mainstream account viewed these same videos and did not receive similar recommendations.

### Ad analysis

With respect to the ads shown to each of the accounts, there are two key differences. The first is that the fringe account was served twice as many ads for education as the mainstream account, particularly for data science and coding courses.

More strikingly, the fringe account was also shown many more ads for social media than the mainstream account. Of the twelve social media ads served to the fringe account, one was for a dating app and the remaining eleven were for Facebook.



## Discussion

**The comparisons between these two accounts provide some notable, if limited, insights into the YouTube recommendation algorithm. More information about the algorithm would be necessary to draw more definitive conclusions.**

### **Videos recommended to the two accounts were largely similar**

Given the two accounts were set up with the same criteria (demographic information, location, etc.) and watched identical content for four of five days, it is perhaps unsurprising that most of the content recommended to each was very similar. Both accounts received recommendations from channels they subscribed to and watched, and the subcategories of other videos were broadly similar, bar some notable exceptions.

The fringe account received fewer recommendations for videos closely related or subject related to those that it had watched or subscribed to, particularly compared to the amount of closely related and subject related videos recommended to the mainstream account. This could be seen as a positive outcome for the recommendation algorithm, as it was not highlighting many conspiracy videos to a viewer that demonstrated an interest in such content. Meanwhile, the mainstream account was recommended a relatively high number of religious videos (7.2% of all unique videos), for which there is no clear explanation. It could be that viewers of Lele Pons or Juan De Dios Pantoja skew religious or Christian, but further research is needed to discern a more definitive explanation. This trend was also seen across the other investigations in this series.

The recommendation of videos associated with weapons and military is a concerning, if minor, trend for the fringe account. It is not entirely clear why the YouTube algorithm would recommend such content to a viewer with demonstrated interest in conspiracies as well, and the opacity of YouTube's recommendation algorithm makes a cause hard to determine. This indicates a potential overlap between conspiratorial video consumption and interest in weaponry, though it is important not to overstate this as it accounts for just a small portion of all the videos recommended to this account.

### **While videos were largely similar, ads were substantially different**

In particular, the fringe account received significantly more ads for Facebook than the mainstream account, another trend for which there is no clear explanation. Without a full understanding of YouTube's algorithm and the targeting criteria set for these ads, it is difficult to draw conclusions, but it is interesting that an account with a demonstrated interest in conspiracy theories was served so many ads to Facebook – a platform where other previous studies have shown that conspiracy theories continue to proliferate despite warnings from researchers.<sup>4</sup>

The fringe account was also shown twice as many educational ads as the mainstream account, in particular advertising data science courses. Without knowing the targeting criteria for these ads, it is difficult to draw conclusions.

### **The fringe account was recommended relatively few videos related to conspiracies**

Overall, the YouTube recommendation algorithm provided some similar conspiracy-type content to the fringe account, but most recommended content was not particularly problematic, which is a positive finding. This could be indicative of down-ranking of conspiracy-type videos or potentially an artifact of YouTube's redirect method, which attempted to redirect users interested in problematic content towards other types of videos.<sup>5</sup> However, it is unclear whether YouTube is still using this method or whether it has been applied to conspiracy content like that viewed by the fringe account.

There are perhaps improvements that could be made to the algorithm, and it is not clear how the recommendation algorithm would change if the hypothetical viewer were to watch some of this recommended conspiratorial or paranormal-focused content. This is something that should be investigated further in future research.

# Appendix

## Spanish-language news persona

Table 1a: Distribution of videos recommended to each account.

# recommendations	Fringe		Mainstream	
	(#)	%	(#)	%
1	382	79.25%	506	85.04%
2	69	14.32%	57	9.58%
3	24	4.98%	15	2.52%
4	4	0.83%	8	1.34%
5	2	0.41%	4	0.67%
6	0	0.00%	2	0.34%
7	0	0.00%	2	0.34%
...				
18	0	0.00%	1	0.17%
...				
28	1	0.21%	0	0.00%

Table 2a: Analysis of videos recommended more than once to each account.

	Fringe		Main-stream	
		%		%
Subscribed	43	34.68%	25	27.17%
Watched	14	11.29%	10	10.87%
Closely related	3	2.42%	5	5.43%
Subject related	9	7.26%	22	23.91%
Unrelated	55	44.35%	30	32.61%

Table 3a: Granular categorization of videos recommended two or more times to each account

	Main-stream count seen	Main-stream % seen	Fringe count seen	Fringe % seen
Animals	0	0%	1	1%
Celebrity	4	5%	1	1%
Conspiracy	0	0%	12	12%
Documentary	2	2%	3	3%
Educational	2	2%	1	1%
Food	2	2%	0	0%
Gaming	0	0%	3	3%
Health	1	1%	3	3%
History	0	0%	1	1%
Hobby/arts/crafts	1	1%	0	0%
Interview	1	1%	2	2%
Meditation/relaxation	0	0%	4	4%
Movies	1	1%	3	3%
Music	8	9%	14	14%
Nature	1	1%	2	2%
News	30	34%	33	33%
Paranormal	0	0%	2	2%
Paranormal fiction	0	0%	1	1%
Random	1	1%	0	0%
Religion	1	1%	0	0%
TV	6	7%	4	4%
Vlogger	27	31%	10	10%

Table 4a: Unique video analysis of Spanish-language news personas.

	Fringe	%	Main-stream	%
Subscribed	80	22.28%	118	25.05%
Watched	36	10.03%	31	6.58%
Closely related	2	0.56%	11	2.34%
Subject related	34	9.47%	97	20.59%
Unrelated	207	57.66%	214	45.44%
<b>Total</b>	<b>359</b>	<b>100.00%</b>	<b>471</b>	<b>100.00%</b>

Table 5a: Unique subcategory analysis of Spanish-language news personas.

Category	Subcategory	Fringe	%	Main-stream	%
Closely related	Celebrity	0	0.00%	2	0.42%
	TV	0	0.00%	1	0.21%
	News	2	0.56%	8	1.70%
	<b>Closely related total</b>	<b>2</b>	<b>0.56%</b>	<b>11</b>	<b>2.34%</b>
Subject related	Celebrity	0	0.00%	2	0.42%
	Vlogger	0	0.00%	64	13.59%
	TV	0	0.00%	4	0.85%
	News	19	5.29%	23	4.88%
	Interview	0	0.00%	2	0.42%
	Documentary	6	1.67%	2	0.42%
	Paranormal	6	1.67%	0	0.00%
	Paranormal fiction	3	0.84%	0	0.00%
	<b>Subject related total</b>	<b>34</b>	<b>9.47%</b>	<b>97</b>	<b>20.59%</b>
Subscribed	News	80	22.28%	118	25.05%
	<b>Subscribed total</b>	<b>80</b>	<b>22.28%</b>	<b>118</b>	<b>25.05%</b>
Unrelated	Celebrity	0	0.00%	8	1.70%
	Music	31	8.64%	29	6.16%
	Hobby/arts/crafts	0	0.00%	5	1.06%
	Vlogger	27	7.52%	2	0.42%
	TV	8	2.23%	24	5.10%
	Random	2	0.56%	8	1.70%

	Food	3	0.84%	20	4.25%
	Health	14	3.90%	3	0.64%
	Religion	13	3.62%	34	7.22%
	Nature	11	3.06%	4	0.85%
	News	0	0.00%	1	0.21%
	Interview	6	1.67%	1	0.21%
	Educational	7	1.95%	18	3.82%
	Compilation	3	0.84%	2	0.42%
	Movies	8	2.23%	9	1.91%
	Sport	14	3.90%	9	1.91%
	Radio/podcast	0	0.00%	4	0.85%
	History	5	1.39%	2	0.42%
	Documentary	3	0.84%	0	0.00%
	Technology	5	1.39%	1	0.21%
	Animals	0	0.00%	3	0.64%
	Books	0	0.00%	1	0.21%
	Gaming	8	2.23%	5	1.06%
	Skit	0	0.00%	1	0.21%
	Astrology	0	0.00%	1	0.21%
	Real estate	0	0.00%	1	0.21%
	Meditation/relaxation	26	7.24%	18	3.82%
	Automotive	4	1.11%	0	0.00%
	Spoken word	1	0.28%	0	0.00%
	Comedy	6	1.67%	0	0.00%
	Channel removed	1	0.28%	0	0.00%
	Weapons	1	0.28%	0	0.00%
	<b>Unrelated total</b>	<b>207</b>	<b>57.66%</b>	<b>214</b>	<b>45.44%</b>
Watched	Conspiracy	36	10.03%	0	0.00%
	Vlogger	0	0.00%	30	6.37%
	News	0	0.00%	1	0.21%
	<b>Watched total</b>	<b>36</b>	<b>10.03%</b>	<b>31</b>	<b>6.58%</b>
<b>Grand total</b>		<b>359</b>	<b>100%</b>	<b>471</b>	<b>100%</b>

Table 6a: Ads analysis of Spanish-language news personas.

Category		Fringe		Main-stream	
			%		%
Education	Data science	3	12.50%	1	8.33%
	Tutoring	1	4.17%	-	-
	University	2	8.33%	2	16.67%
	<b>Education Total</b>	<b>6</b>	<b>25.00%</b>	<b>3</b>	<b>25.00%</b>
Entertainment	Theatre	-	-	1	8.33%
	<b>Entertainment Total</b>	<b>0</b>	<b>0.00%</b>	<b>1</b>	<b>8.33%</b>
Product	Cell phone	1	4.17%	-	-
	Clothing	-	-	1	8.33%
	Computer hardware	1	4.17%	1	8.33%
	Razor	1	4.17%	1	8.33%
	Security camera	1	4.17%	-	-
	Solar panels	1	4.17%	1	8.33%
	<b>Product Total</b>	<b>5</b>	<b>20.83%</b>	<b>4</b>	<b>33.33%</b>
Service	Tax preparation	-	-	1	8.33%
	<b>Service Total</b>	<b>0</b>	<b>0.00%</b>	<b>1</b>	<b>8.33%</b>
Technology	Internet service	-	-	1	8.33%
	Search engine	1	4.17%	1	8.33%
	Social media	12	50.00%	1	8.33%
	<b>Technology Total</b>	<b>13</b>	<b>54.17%</b>	<b>3</b>	<b>25.00%</b>
<b>Grand Total</b>		<b>24</b>	<b>100.00%</b>	<b>12</b>	<b>100%</b>

## Endnotes

- 1 Stocking, G. et al (2020). 1. YouTube News consumers about as likely to use the site for opinions as for facts. Pew Research Center, 28 September. Available at: <https://www.pewresearch.org/journalism/2020/09/28/youtube-news-consumers-about-as-likely-to-use-the-site-for-opinions-as-for-facts/>.
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