

AMENDED Exhibit 535

PLAINTIFFS' OMNIBUS OPPOSITION TO DEFENDANTS' MOTIONS FOR SUMMARY JUDGMENT

Case No.: 4:22-md-03047-YGR

MDL No. 3047

In Re: Social Media Adolescent Addiction/Personal Injury Products Liability Litigation

[Findings]: User Inactivity Survey

Author: @Eric Morrison

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TL;DR:

We conducted a survey with 311 inactive US users in order to determine how to reduce churn and improve retention. We find that although inactive users aren't detractors (and in fact often slightly positive about TikTok), they do experience widespread issues in "managing their time and attention" on TikTok, and in TikTok's "content quality." In turn, we pinpoint 6 different factors that can best improve inactive user satisfaction and churn, including perceived visual appeal, user trust, and content diversification (all 6 noted below for reference). We also recommend a subtle approach to reengaging inactive users that avoids overtly treating them as inactive or aggravating existing issues (e.g., push notifications), and better aligning business and user definitions of inactivity.

1. Perceived visual appeal
2. Belief that TikTok's culture embraces people of different ideas
3. Overall trust in TikTok
4. Coverage of a user's desired content genres
5. Belief that TikTok is designed for someone like me
6. Ability to manage time and attention spent using TikTok

Background:

Between Q1-Q3 2019, we had 52.5M US users become inactive and for every 100 users that join only 33 remain active after 6 months. As one part of [[HYPERLINK "https://bytedance.feishu.cn/space/doc/doccnOnsM4VILjkO0PIRnFH0Kcd" \h](https://bytedance.feishu.cn/space/doc/doccnOnsM4VILjkO0PIRnFH0Kcd)], we conducted a survey in order to learn more about why users become inactive.

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[[HYPERLINK "https://bytedance.feishu.cn/docs/doccnGzJ7HACJrg2jXLPo9sK2dd" \h](https://bytedance.feishu.cn/docs/doccnGzJ7HACJrg2jXLPo9sK2dd)](preliminary findings)

Goals:

- ✧ To describe the inactive segment of TikTok's broader userbase and their experience with TikTok
- ✧ To identify factors that can best explain user inactivity and churn

Survey Design and Sampling:

We conducted a detailed 15-minute survey with 311 inactive US users. This allows a $\pm 6\%$ margin of error at a 95% confidence level. The survey was conducted November - December 2019 (it took 7 weeks to collect the responses due to low incidence of qualifying respondents).

All respondents were recruited via external consumer panels, and had to meet one requirement: that they have downloaded TikTok, but have not used it in at least the past 30 days. This corresponds to our internal definition for **'inactive'** users; we refer to **'churned'** users in this study as those who self-identify as no longer using TikTok.

Our respondents have used TikTok for varying lengths of time. Roughly 13% used TikTok for less than one week, 49% for more than a week but less than 3 months, 17% for 3-6 months, 15% for 6-12 months, and 7% for more than a year. We have listed further demographic distributions of our respondents in the appendix, though we did not find any to be significant in explaining inactive user satisfaction or churn.

Key Findings:

Inactive users aren't detractors; instead, they tend to be satisfied with TikTok and often don't see themselves as inactive.

- ✧ 1 in 2 inactive users express satisfaction with TikTok, and only slightly over 1 in 4 define themselves as churned. This further affirms previous findings that 70% of 'new' inactive users (those using TikTok once and then becoming inactive for 30 days) actually consider themselves moderate-to-frequent users, and only 6% consider themselves to be churned (n=79).
- ✧ Inactive users also find TikTok slightly visually appealing (mean = 5.0, 7-pt scale), slightly easy to use (mean=5.2, 7-pt scale), somewhat trustworthy (mean = 3.3, 5-pt scale), somewhat useful (mean = 2.9, 5-pt scale). They are also somewhat likely to recommend TikTok to a friend or colleague (mean = 3.3, 5-pt scale).
- ✧ This in turn counters previous hypotheses that inactive users may have had adverse reactions to TikTok, or that certain aspects of our user experience are polarizing.

Inactive users overwhelmingly cite "attention management" and "content quality" issues.

- * Half of inactive users cite at least one issue related to managing how they spend their time with TikTok; 24% report too many notifications, 23% report too much time spent on TikTok, and 20% report too many ads.
- * Half of inactive users cite content quality issues; 31% cited repetitive content, 18% cited content not being useful, and 18% cited content not being relevant.
- * "Technical" and "Trust" related issues were slightly less common (30% of users cited each). Issues related to user understanding and learnability were least common (10% of users cited).

When asked about what they would like to improve in their experience, inactive users cited a diverse longtail of requests, indicating that there is no one clear "silver bullet" to resolving inactivity.

- * 11% of users cited improved usability and learnability, 10% cited improved content quality, 6% requested improved community interaction (both harassment and bullying as well as requests for improved social capabilities).
 - The extended longtail of requests also includes technical issues, improved age verification, and more options for customization and personalization.
- * We also assessed the potential impact of 5 key UX update areas on user inactivity: content discovery, livestream, editing tools, direct messaging, and playlists.
 - We find that inactives most strongly favor improving content discovery and editing tools (50% report favorability to use), whereas livestreams and direct messaging perform weakest (30% report favorability to use).
 - Yet, through correlational analysis, we found that all areas have a subtle, positive association with a user's existing perceived usefulness, and all but direct messaging have a positive association with a user's existing satisfaction (see Appendix Figures 1-9).
 - This implies that while all 5 improvements can positively contribute to the user experience, all 5 are also unlikely to make a meaningful difference for our last happy inactive users.

Three factors carry a significant, positive effect on inactive users' satisfaction with TikTok

- * In order of importance, they are:
 - Perceived visual appeal
 - Belief that culture embraces people of different ideas
 - Overall trust in TikTok

* There are also two factors that are not-quite significant (i.e., significant only at a 90% confidence level, rather than 95%). They are:

- Belief that TikTok is designed for someone like me
- Difficulty managing time on TikTok

Two factors significantly affect an inactive user's likelihood to define themselves as churned

* In order of importance, they are:

- Perceived visual appeal
- Perception that TikTok helps kill time.

* As either of the two factors increases, one becomes more likely to **not** identify as churned. This suggests that although product aesthetics and ability to kill time might be considered by some cosmetic or one-dimensional, they actually may reduce self-identified churn.

Content diversification can better improve satisfaction and churn than does resolving broader "content quality" issues.

* We asked respondents what genres of short-form content, and which genres they have seen on TikTok. We then computed a set of count variables to measure "unwanted content" (when a user is exposed to a content genre on TikTok they don't like) and "content gaps" (when a user isn't seeing a content genre they like on TikTok).

* We find that "content gaps" has a strong, significant effect on inactive user satisfaction. That said, we did not find that either "unwanted content" or broader content quality issues (e.g., repetition, relevance, usefulness) to have effects on satisfaction.

Recommendations:

Better align internal definitions of inactivity with user definitions, and avoid solutions that 'hack' engagement metrics without providing added product value.

* We see that inactive users often are happy and feel engaged with TikTok. Furthermore, we highlight the opportunity to better help inactive users manage their time and attention using TikTok.

* This study's findings also affirms [[HYPERLINK "https://bytedance.feishu.cn/docs/doccnG5SAX87pZtKgrdBaZQVNYd" \h](https://bytedance.feishu.cn/docs/doccnG5SAX87pZtKgrdBaZQVNYd)] that a primary reason for tenured churn might be heavy usage patterns that aren't supported by clear concepts of TikTok, or understanding of how TikTok usage aligns with their goals.

* We thus recommend avoiding tactics that can increase immediate engagement at the expense of long-term happiness and retention (e.g., number of notifications).

* We also need to do a better job of understanding how users want to spend their time and attention on TikTok, clearly setting users' mental models for TikTok, and identifying and supporting [[HYPERLINK "https://bytedance.feishu.cn/docs/doccnJ5Q6jGCSHXMZf38rIDQEIq" \h](https://bytedance.feishu.cn/docs/doccnJ5Q6jGCSHXMZf38rIDQEIq)] of TikTok.

Identify new ways to optimize 6 factors shown to positively impact inactive user happiness and prevent churn.

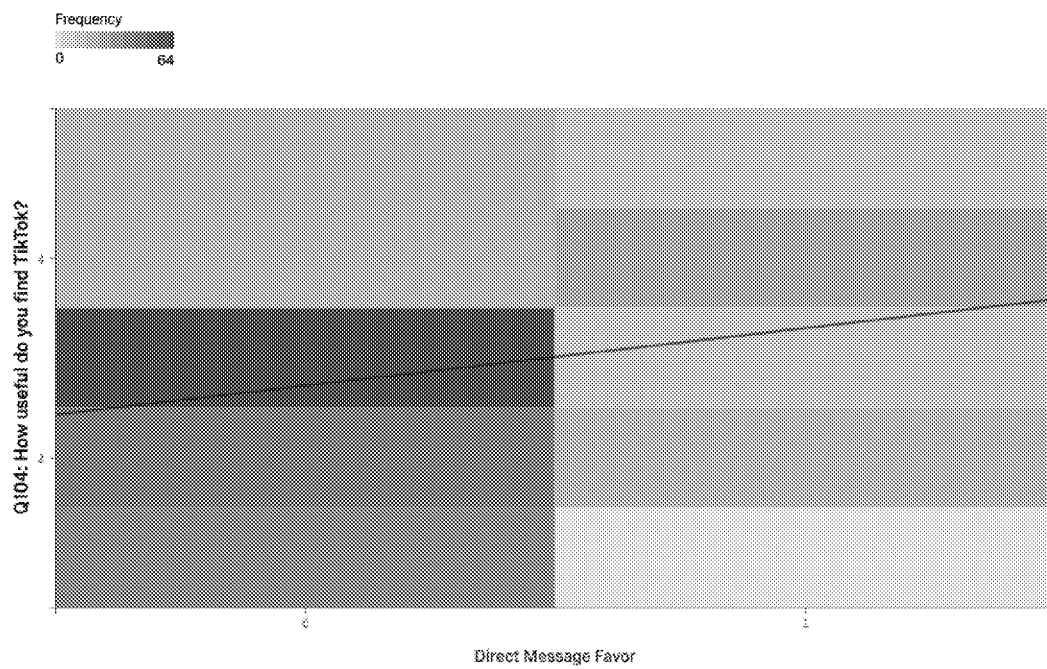
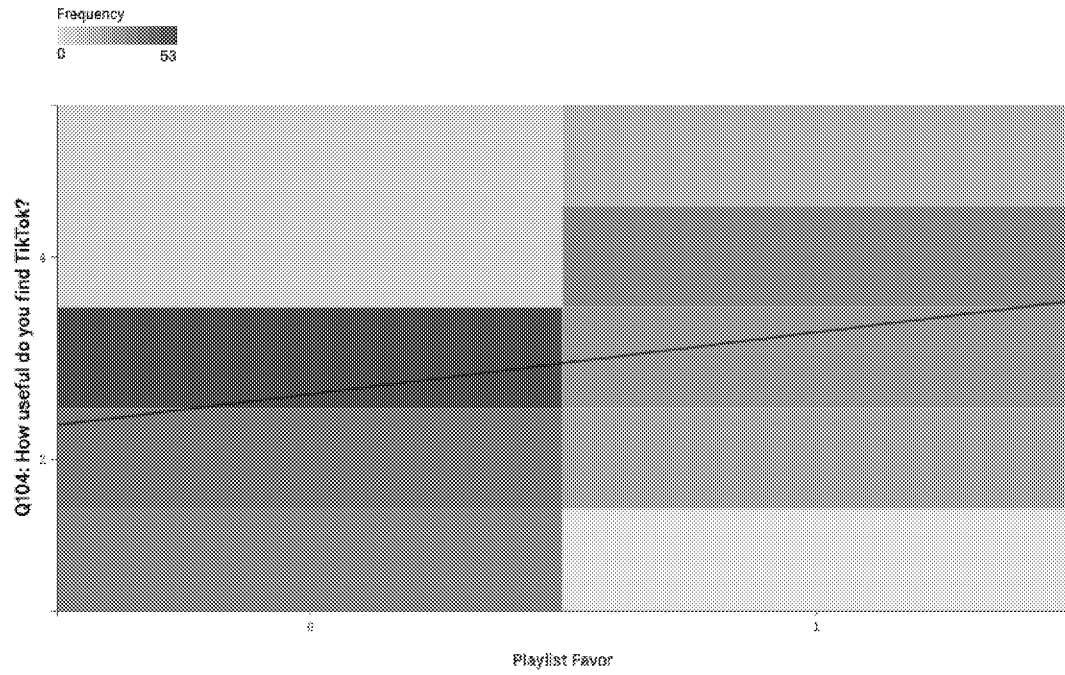
- Perceived visual appeal
- Belief that TikTok's culture embraces people of different ideas
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- Ability to manage time and attention spent using TikTok

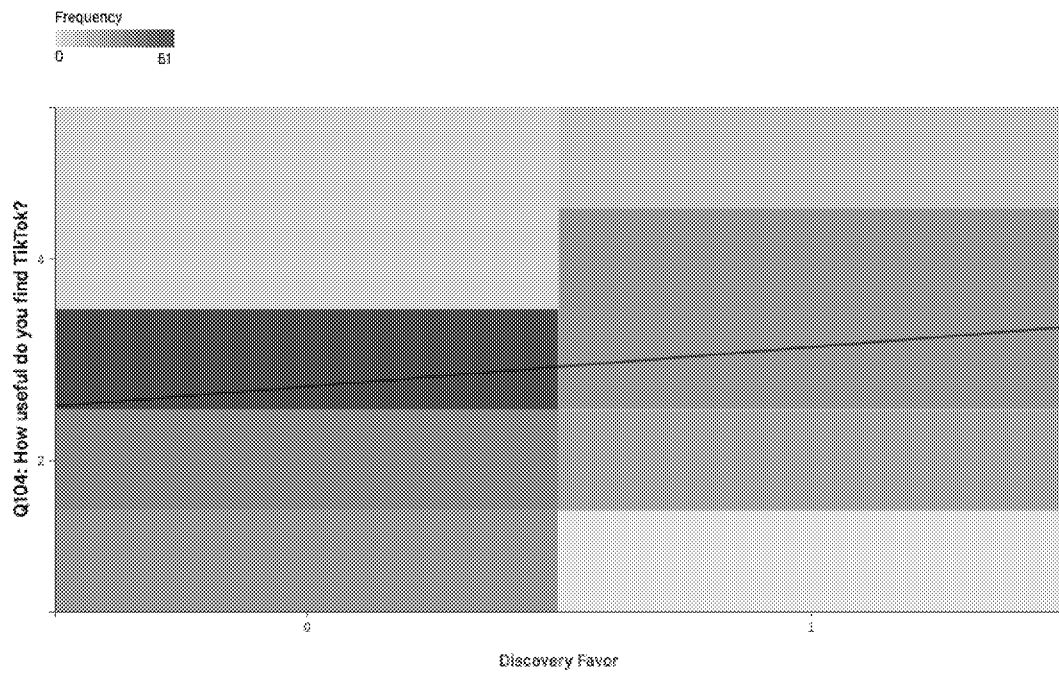
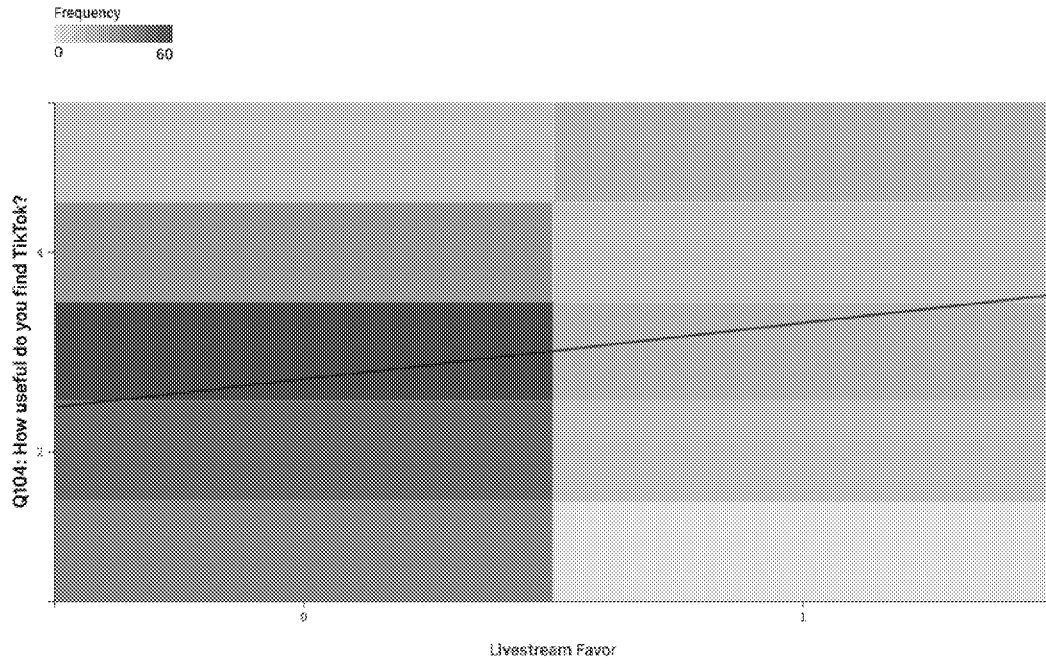
Appendix:

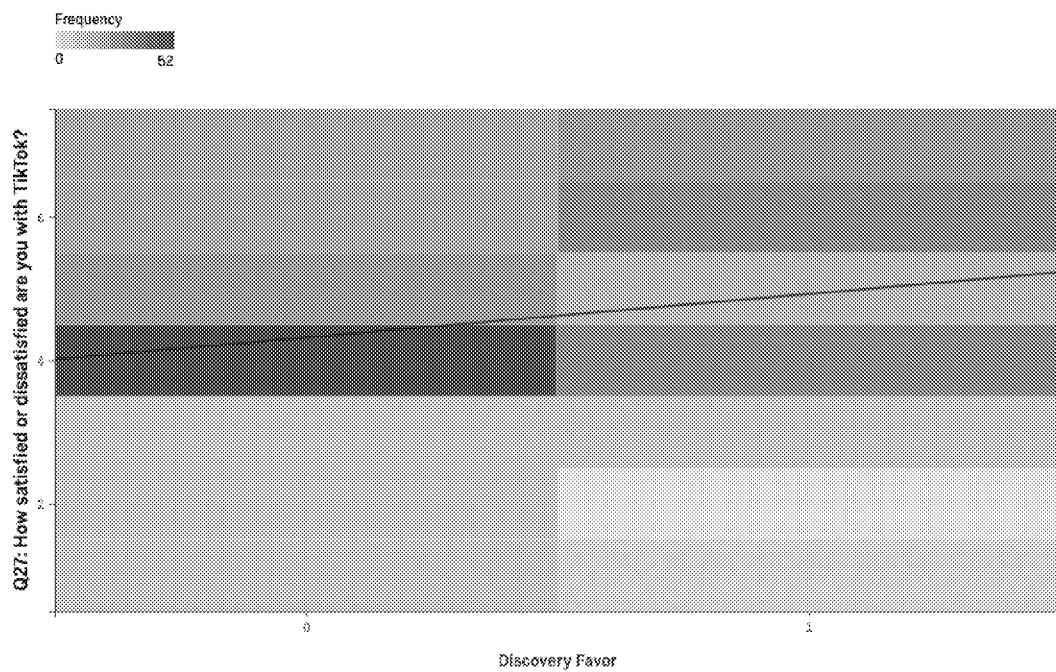
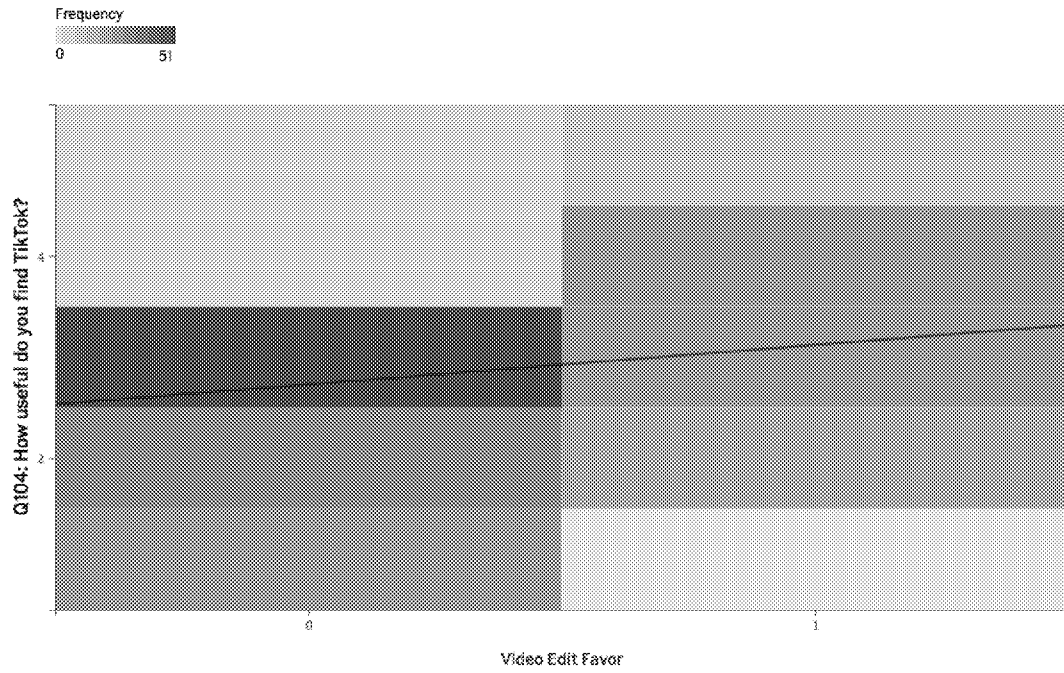
Full Report

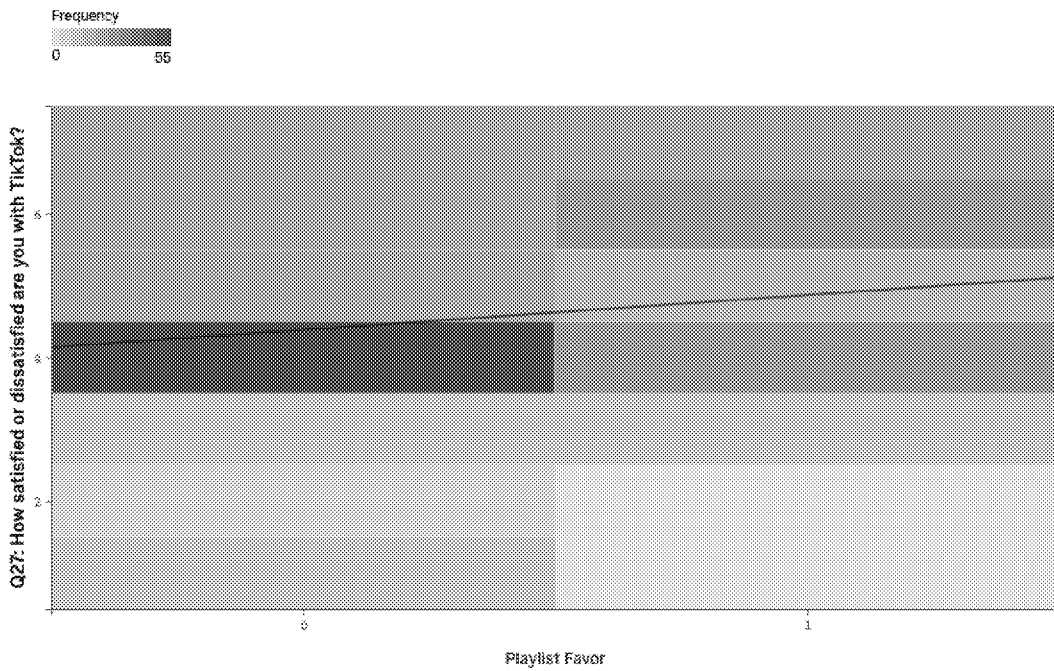
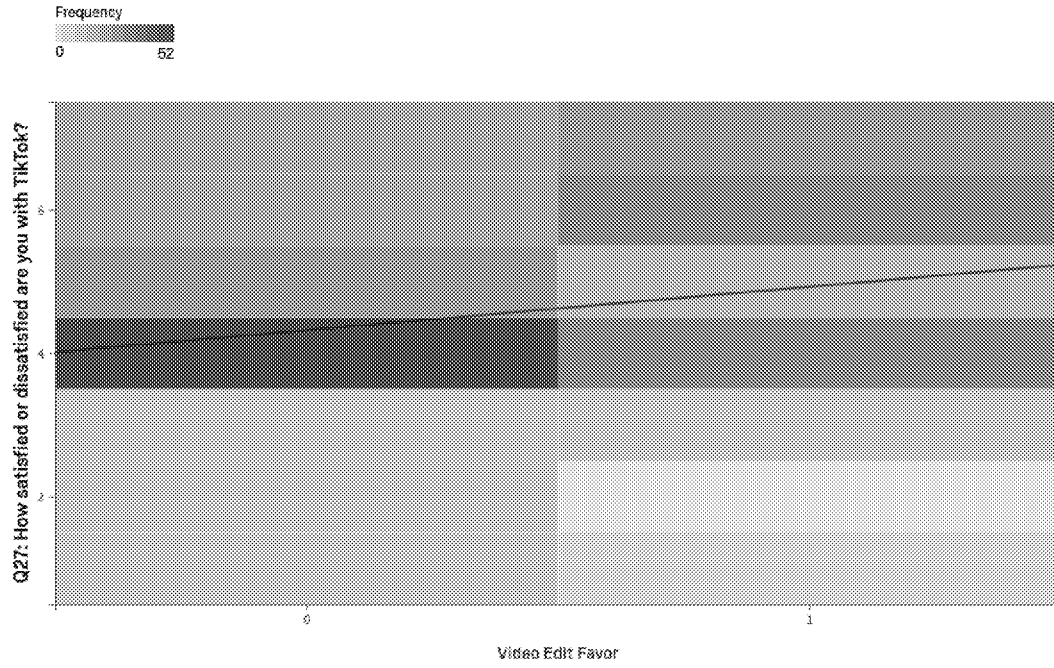
Figures 1-9

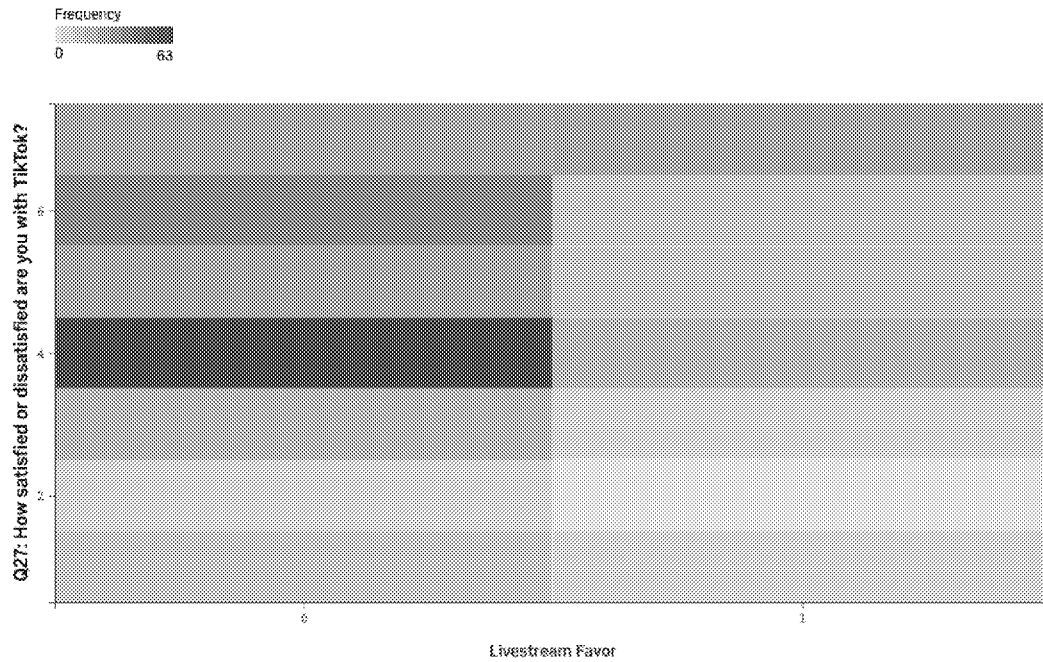
In these figures, you can see that as one's likelihood to favor using a potential update increases, both their existing satisfaction and existing perceived usefulness also increase.











Appendix Figure 10

To build our regression models for satisfaction and churn, we considered 46 variables including UX KPIs (e.g., ease of use), targeted product perceptions, demographics, product issues experienced, and various measures of content preference.

Regression output for model to predict an inactive user's satisfaction with TikTok. As you can see below (in the "Standardized Coefficients" and "P-value columns): the first 3 factors significantly explain satisfaction ($p < .05$), while the final 2 factors are very near-significant.

Sample Size	R-Squared	Adjusted R-Squared	Standard Error	Coefficient of Variation	Significance	Model Fit (AIC)
311	0.391	0.381	1.37	0.299	< 0.00001	1.087

Parameters	Relative Weights	Coefficients	Lower CI	Upper CI	Standardized Coefficients	P-value
Q105: How visually a...	42.5%	0.390	0.267	0.51	0.368	< 0.00001
Q103: How trustwort...	20.1%	0.216	0.066	0.37	0.150	0.00499
The culture of TikTok ...	18.3%	0.176	0.050	0.30	0.146	0.00651
TikTok is designed for...	15.7%	0.155	-0.019	0.33	0.096	0.0797
Attention Issues	3.4%	0.275	-0.038	0.59	0.079	0.0849
Intercept	0.0%	0.466	-0.169	1.10	0	0.150

Appendix Figure 11

Regression outputs for model to predict an inactive user's likelihood of self-identifying as a churned user. We find that as TikTok's ability to kill time, and perceived visual appeal increase one point, a user is 1.32 and 1.34 times as likely to **not** identify as churned.

Sample Size	McFadden's R-Squared	Model Fit (AICc)
311	0.0707	345

Self-Defined Churner = 1

Parameters	Coefficients	Odds	Standardized Coefficients	P-value
Intercept	1.380	3.97	0	0.00607
TikTok helps me kill time	-0.295	0.74	-1	0.0262
Q105: How visually appealing or u...	-0.276	0.76	-1	0.00119

What motivations led inactive users to initially download TikTok?

- Inactive users' reasons for adopting TikTok do not depart considerably from those active users have cited in past research.
 - Inactive users are most likely to cite family or friend influence in downloading (22%). Of those, 17% downloaded it primarily for their children's usage, and 4% downloaded it to monitor their children's activity.
 - Inactives also frequently cited download motivations to be entertained (19%), curiosity about TikTok (10%), and TikTok's popularity (7%).

It is worth noting that the *positive* effect of "Difficulty managing time on TikTok" (as difficulties increase, satisfaction increases) demonstrates how user happiness may mask or cause its own set of unique issues for users.

- As a result, we may need to track metrics outside of user satisfaction (e.g., product usefulness, time well spent) in order to adequately keep a pulse on user issues affecting retention.