

# "My Videos are at the Mercy of the YouTube Algorithm": How Content Creators Craft Algorithmic Personas and Perceive the Algorithm that Dictates their Work

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**“My Videos are at the Mercy of the YouTube Algorithm”:  
How Content Creators Craft Algorithmic Personas and  
Perceive the Algorithm that Dictates their Work**

by Emily Pedersen

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**Research Project**

Submitted to the Department of Electrical Engineering and Computer Sciences, University of California at Berkeley, in partial satisfaction of the requirements for the degree of **Master of Science, Plan II.**

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## Abstract

“My Videos are at the Mercy of the YouTube Algorithm”:  
How Content Creators Craft Algorithmic Personas and Perceive the Algorithm that  
Dictates their Work

by

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Masters of Science in Computer Science

University of California, Berkeley

People increasingly have to manage their relations with opaque, proprietary algorithms in their social, personal, and professional lives. How do creative content creators make sense of the algorithms that these platforms use? We take the case of YouTube because of its widespread use and the spaces for collective sense making and mutual aid that content creators (YouTubers) have built within the last decade. We engaged in ethnographic field work with hobbyist YouTubers which included one-on-one interviews as well as analyzing content on YouTube and its related forums. We found that YouTubers make sense of the algorithm by assigning human characteristics and goals to it to explain its behavior; what we have termed *algorithmic personas*. We identify three main algorithmic personas on YouTube: Agent, Gatekeeper, and Drug Dealer. We discuss the implications of these metaphors for developing our understanding of the roles that algorithms play in the real world and their politics and ethics. We also found that the creators we interviewed in-person believe YouTube highly values sensationalist content, creating a toxic online community. Creators want the platform to change; they want it to include a more diverse representation of content and creators, and to value creative content more highly. In addition, we explore the wider YouTube’s community concerns and their technical implications.

## Acknowledgments

I'd like to thank my co-authors on this work, Professor Niloufar Salehi and fellow student, Eva Wu. Large portions of the contents of this Masters report, including the prose, appear in a jointly authored manuscript. The manuscript is currently under review, and is entitled: "Agent, Gatekeeper, Drug Dealer: How Content Creators Craft Algorithmic Personas" by Pedersen, Wu, and Salehi. Certain sections and diagrams are newly written by me for this report. This includes: Preface, Perceptions of the Algorithm in the Results chapter, Challenges facing YouTube and their Technical Implications in the Discussion chapter, and the Future Work section in the Discussion chapter. I also added content to the abstract, Introduction, and Conclusion sections. In total, I added about 10 pages of individually written content.

I'd also like to thank Professor Marti Hearst as the first reader and my advisor for the CS Masters program.

Finally, I'd like to thank the YouTube content creators who took the time to speak with me.

# Preface

I started watching YouTube videos when I was around 13 years old. I remember I'd come home from school, and make myself a bowl of cereal. Before buckling down to start my homework, I'd watch a couple of makeup tutorials and vlogs. I still do that to this day (minus the bowl of cereal). Some of my favorite YouTubers at the time were beauty and lifestyle vloggers Bethany Mota and Meredith Foster. I enjoyed watching their videos because I felt connected to them, even though I only knew them from what they shared online, and they didn't know me. Watching their and others' videos was an escape. It was nice for a few minutes to forget my day, and jump into someone else's.

When I was around 15, I filmed a haul video. I remember my mom and I had just come home from shopping, and I wanted to record myself reviewing and trying on the items. We set up a tripod, and an area for me to sit in front of the camera in my bedroom, and we filmed. I remember I was nervous talking to the camera, and I didn't say anything super interesting or funny. I never posted that video. It takes a lot of guts to put yourself out there. You need luck, dedication to making content for your audience, and perseverance to continue when times get tough. I definitely wasn't ready for the pressure and scrutiny as a 15 year-old.

Flash forward to now, I still enjoy watching YouTube videos, but I view them in a different light. I'm aware of YouTube's power to algorithmically elevate or suppress creators' content. Although the viewers help dictate what becomes popular on the platform, YouTube has the final say. I've always wondered how do content creators view their relationship with YouTube? Do they feel empowered or limited? How do they understand their jobs? YouTube has only been around for roughly 14 years, so the expectations of YouTubers' jobs are constantly evolving.

Through my masters' thesis, I wanted to explore content creators' perceptions of YouTube. I wanted to better understand the algorithmic challenges it takes to operate billions of videos, balancing creators' needs and viewers' desires. My personal takeaway is that although the platform isn't perfect, it has given content creators a voice to express themselves and spread good if used mindfully. Maybe I'll make a YouTube video, so that future generations can eat cereal, procrastinate on doing their homework, and escape their day for a few minutes.

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# Chapter 1

## Introduction

A growing number of people have to negotiate with opaque, proprietary algorithms as part of their work. Algorithms deployed by platforms such as YouTube and Uber manage the work of content creators and drivers, decide on pay, and effectively redistribute uncertainty and risks from the platforms to workers with no means for recourse [36, 39, 15]. In recent years, researchers have called for increased algorithmic fairness, accountability, and transparency<sup>1</sup> [65, 76, 52].

Largely missing from these conversations is engagement with the people most affected by these algorithms: how do they make sense of the algorithm? How would they want the algorithms to change? Understanding peoples’ viewpoints is essential to focus calls for more fairness, accountability, and transparency in ways that actually matter to the people they affect. Here we focus on YouTube and ask: How do content creators make sense of an algorithm that impacts their creative work?

Around 400 hours of video are uploaded to YouTube every minute — or 65 years of video a day [34]. To deal with the large amount of content on the platform YouTube deploys algorithms to customize feeds, recommendations, and search results. What people refer to generally as “the YouTube algorithm” is in fact a mash up of technical processes for recommendation [6], content moderation [54], engagement tracking [47], popularity and taste prediction [77], user modeling [32], and copyright infringement detection [8]. All related, yet distinct areas of machine learning and computer science. The algorithm is collectively created and maintained by the thousands of people who work for the company as software engineers, content moderators, and researchers, as well as millions who participate on the platform, create content, and help train the algorithm [60].

I started this research because I was interested in the creator culture behind YouTube. YouTube is a participatory culture, in which individuals are contributors. Anyone can post a video, and like/dislike/comment on videos, and subscribe to other members. But it has become much more than that. In May of this year, YouTube CEO Susan Wojcicki announced at a Broadcast marketing event that YouTube has 2 billion monthly users [68]. Why does

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<sup>1</sup>The ACM Conference on Fairness, Accountability, and Transparency (ACM FAT\*) was founded in 2018.



YouTube have so many users, when competitors such as Netflix, Hulu, Amazon, and basic cable exist? YouTube has a unique online community. In 2006, Google acquired YouTube for 1.65 billion dollars, when YouTube was only a year and a half old [67]. Google already had its own technically superior video sharing platform, Google Videos, but it bought YouTube for YouTube’s community. At the time YouTube had 50 million users worldwide and had 46 percent of the online video traffic, compared to Google Video’s 10 percent [67]. YouTube proved that the online video marketplace is dependent on video sharing, commenting, ranking, and embedding and suggestions — in other words having a community. Creators are a huge part of the YouTube community. They need to produce quality videos, engage and satisfy their audience members, and fit into the larger YouTube community. Given content creators’ tall task, I’ve always wondered how do they do it? Why do content creators start making videos? What motivates them to continue? How do they understand their role in the YouTube community? Most interestingly, how do they make sense of the algorithms behind YouTube?

In this paper I focus on YouTube content creators (YouTubers) and seek to learn their understanding of the YouTube algorithm. I focus on YouTubers because of their particular position in relation to a widespread, real-world algorithm that impacts their work. YouTubers create the content that makes YouTube valuable yet they have very limited power relative to the platform and algorithm [78]. Most YouTubers are not paid for their work. A path to professionalization and monetization exists which requires first becoming popular on the platform — as decided in part by the algorithm [22].

In response to these conditions YouTubers have created communities online and in person within the last decade that they use to share tips and engage in mutual aid and collective sense making. This collective sense making is challenging because YouTubers don’t have access to the technical aspects of the algorithm. Additionally the algorithm doesn’t always follow predictable patterns and frequently changes with unannounced experiments [28]. On the other hand, YouTubers directly interact with the algorithm on the ground and have high stakes involved. Therefore, they have a unique vantage point to understand what the algorithm really does in practice.

To gain a deeper understanding of how YouTubers make sense of the algorithm, I worked with a graduate student and a professor from the School of Information at UC Berkeley, and we spent seven months engaged in ethnographic field work focusing on hobbyist YouTubers. We sought to learn how YouTubers view the cultural meanings and values of the algorithm by gathering information from two main sources [64, 33]. First, we asked YouTubers to reflect on their understanding of the algorithm in interviews. We used sketches and alternative designs as provocations to elicit reactions from our interviewees about what the algorithm does and what they would like it to do. Second, we sought to find people where they are by analyzing native formats of information sharing. We watched videos of YouTubers talking about the algorithm on the platform. We reviewed information available online about VidCon, the major convention for YouTubers. We also read forums and subreddits and distributed a wiki survey via those channels [59].

We found that YouTubers largely make sense of the algorithm by *crafting personas for*

*it and viewing it as an actor: with goals, tastes, histories, and attitudes.* We categorized our themes into three major personas that repeatedly came up: Agent, Gatekeeper and Drug Dealer. An Agent is someone who manages and helps the creator in their work by finding an audience for them and promoting them. A Gatekeeper is someone who stands between the creator and viewers and decides who gets through. A Drug Dealer has one goal: keeping viewers hooked on the platform for as long as possible. The Drug Dealer's relation with the content creator is a tangential one. Here, we follow Seaver and analyze the algorithm *as culture* [64]. Like culture, algorithms in the real world are embedded in social contexts and contain multitudes. We stress that our findings should not be viewed as folk theories that stand in contrast to reality or the expert view. Instead, we argue that what YouTubers believe the algorithm to be is what the algorithm is, at least in part.

Once we understand the personas that YouTubers use to make sense of the algorithm, we can in turn start using those personas to develop our understanding of algorithms in the real world. We can ask questions about people's relations with those personas including power relations, accountability, and legal recourse. For instance, a drug dealer is viewed in society as potentially harmful because of the addicting nature of drugs and the public harms associated. Here there is precedent for policy in favor of public health. Additionally, talent agents have a long history in media production [40]. Because of the power that agents have over their clients, they often have legally binding contracts. Can people have a contract with an algorithm?

We also discovered that the YouTubers we interviewed in-person are frustrated by the platform. They believe that YouTube promotes controversial content because of their high watch times and view count. Creators want YouTube to return to its roots, prioritizing creative content and channels with great content, but relatively small subscriber bases. To remedy the platform, creators want to YouTube to recommend more diverse content to viewers, and content that actually adds value to viewers' lives. Understanding creators' concerns with the platform, we can discuss solutions to give creators more control in the creator-algorithm relationship. Can we build solutions so that creators can "talk" to the algorithm to understand its behavior?

# Chapter 2

## Related Work

We rely on two major areas of prior research. First, research on content creators on YouTube and their relation to platforms and algorithms. Second, research on how users develop folk theories or imaginaries of algorithmic systems.

### 2.1 Creating Content on YouTube

Much of the research on YouTube content creators has focused on popular creators who earn a living on the platform. Prior work has highlighted the factors that contribute to celebrity YouTubers' popularity, such as originality, having a charismatic personality, networking and collaboration with bigger YouTubers, and luck [35]. Research on big beauty bloggers has analyzed the algorithm's effect on driving a hegemonic gender identity and on facilitating unfair levels of visibility among certain categories of video bloggers [10]. Other research on YouTube content creators explore their relationship with multi-channel networks [30], their motivations and strategies [11], their user agency as a nuanced and multi-faceted concept [78], their real-life impact on teenagers [81], and a comparison of young YouTubers to adult and professional YouTubers [50]. However, to our knowledge, none has explicitly focused on the larger population that we refer to as hobbyist YouTubers: those with subscriber counts below 1,000,000.

We situate our study in the YouTube platform and take note of the differences of YouTube comparing to other social media platforms. The self-presentation goals of YouTuber content creators are often divergent from the posters of Facebook. One of the top three goals for a Facebook poster is to not rock the boat [24]. In contrast, the YouTubers we interviewed express the need to stand out in an over-saturated sea of content.

### 2.2 Algorithms that manage work

Prior research has investigated the algorithm as the manager and human workers' affective reactions to these algorithms that take on the roles of allocating work, or technically medi-

ating worker-employer relationship [36, 46]. Algorithms manage work, decide on pay, and effectively redistribute uncertainty and risks from employers to workers with no means for recourse. In a media environment such as YouTube, where the boundaries between commerce, content and information are currently being drawn, content creators who situate between video consumers and video distributors, have rather limited potential to “wrest power from the few”, let alone to “change the way the world changes” [78]. Most of the YouTubers are invisible workers with little negotiation power in the technically mediated worker-employer relationship.

## 2.3 Algorithmic Folk theories and Imaginaries

Studies of folk theories have looked into how users of social media form theories of the workings of the algorithms and how users’ folk theories of algorithms frame their behaviors [16, 24, 12]. Much of the research discuss folk theory formation process, which starts from information foraging, to sense-making (including social sense-making) to formulation of folk theories. Folk theories guide users’ behaviors from self-presentation to counteract and the theories are often in flux, where users iteratively form theories using the various information input they receive [24]. Bucher explores folk theories via the algorithmic imaginaries that are “the way in which people imagine, perceive and experience algorithms and what these imaginations make possible.” Algorithmic imaginaries not only influence users’ subsequent behaviors, but also affect their moods and feelings. [12]

## 2.4 Algorithm as culture

A subset of research on algorithmic folk theories centers around cultural meanings and values of the algorithm. Seaver argues that algorithm should be considered as culture and not just as an object in culture. This angle views the algorithm as a mix of human decisions and mysterious inner working of the code [64].

With much research that focuses on the algorithmic folk theories crafted by people and the power that algorithms hold on people, little investigation has gone into personification to explain the relationship between human and algorithm despite algorithms’ constant and intimate roles in our lives. Willson briefly touches on the anthropomorphizing language in discussions of algorithms. She also highlights the lack of an appropriate language to describe complex processes of algorithmic decisions and human interactions with algorithms [82].

## 2.5 Design as provocation

The methodology of our research relies heavily on a body of previous work that leverages design not to simply provide a solution, but to provoke critical thinking of a socio-technical issue [25, 17, 86, 41, 85]. Wong and Mulligan outline the four purposes of design (in the

context of privacy) including, to solve privacy problem, to inform and support privacy, to explore people and situation, and to critique, speculate or present critical alternatives. In our study of the hobbyist YouTubers, we leveraged evocative design sketches that embed alternate sets of ideals to foster discussions about values, ethics and morals. The goal is to not focus on the world as is now, but to explore the world as it could be [41, 85].

# Chapter 3

## Study Design

Our goal is to understand how content creators make sense of the YouTube algorithm. Relying on rapid ethnography, an established framework in HCI research [51], we focused our research question and spent seven months engaging in field work to study the YouTube algorithm as a diffuse socio-technical system from the content creator’s perspective [64, 69]. We chose to focus on hobbyist YouTubers which we defined as those actively producing content for YouTube and who have fewer than 1 million subscribers. This covers the majority of YouTube content creators. Reaching 1 million subscribers acts as a right of passage for celebrity status on YouTube with websites devoted to tracking the YouTube “millionaires” [87]. Therefore, we focus our analysis on hobbyists who to the best of our knowledge do not (yet) earn money from their work.

### 3.1 Data Gathering

We gathered data in two main ways: directly in interviews and a wiki survey, and indirectly through content analysis. This triangulation of methodologies enabled us to verify our findings with more confidence by both eliciting reactions from people and sometimes probing them to go deeper, as well as meeting people where they are and analyzing organic conversation in the context of the study [53, 64].

### 3.2 Interviews and wiki survey

We began our study by conducting interviews with local hobbyist YouTubers. This enabled us to establish a basic understanding of their attitudes toward the algorithm and to deepen that understanding by asking questions and probing through card sorting and speculative design exercises. At the end of our study we sought to validate our findings with a larger group and used a wiki survey that we distributed on YouTuber forums and subReddits [59].

We conducted the interviews from October to November 2018. We found participants in three ways: First, our personal connections (5 participants). Second, we searched YouTube

for content related to our university and reached out to the content creators (3 participants). Third, we posted a notice on our university’s various Facebook pages. We recruited one person from our Facebook post and reimbursed them with \$10 for their time. We interviewed a total of 9 people (6 male, 3 female; 3 White/Caucasian, 3 Asian, 2 South Asian, 1 Hispanic; aged 18 to 30,  $M = 21$ ). Our interview participants had an average of 5 years creating YouTube videos and ranged from posting content weekly to yearly on their channels. As of December 2018, our participants had between 56 to 257,000 subscribers (average=38,100, median=4,950). Most of our participants primarily make “lifestyle videos” with one participant making music videos.

Interviews were either held on the UC Berkeley campus or via Google Hangouts when in-person was not possible. Each interview took around one hour to complete. We audio recorded and transcribed all interviews. Our interviews were semi-structured and centered around the following questions:

- How do content creators make sense of the YouTube algorithm?
- How do their perceptions of the algorithm affect how and what they post?
- If they could, what would YouTube content creators change about the algorithm?

One of the challenges that we faced in our interviews was prompting participants to dig deeper into how they make sense of the algorithm beyond the surface level features that they imagined the algorithm cares about (e.g. thumbnails). Part of the reason was that algorithms have very recently entered mainstream conversation and we have not yet developed the conceptual tools for people to describe their effects. The problem became even more challenging when we asked people to imagine alternatives. Traditions of participatory design teach us to engage users in the design process [63]. Speculative design allows us to overcome opacity stemming from corporate secrecy and instead imagine what we would want an algorithm to do. But it is not clear how to engage people when opacity is a fundamental characteristic of algorithms [13]. How might HCI researchers engage with stake-holders about the effects of seemingly invisible algorithms?

In absence of a physical representation of an algorithm to point to and discuss we chose to create physical representations of *algorithmic effects*. This is close to the ways that people actually experience algorithms in the real world. Eslami et al. took a similar approach [26]. They made study participants aware of the existence of algorithms in their Facebook News Feed by creating an alternative feed that did not have algorithmic selection. We extend this approach and invite participants to analyze and change what the algorithm does: After our first three interviews, we created prototypes of alternative YouTube front pages and recommendation tabs that addressed matters our interviewees had discussed (see Figure 3.1). We continuously adapted these prototypes and made new ones based on our interviews. The goal was not for us to create the best possible YouTube algorithm, but to use design as provocation to elicit reactions from our interviewees. We used our designs to

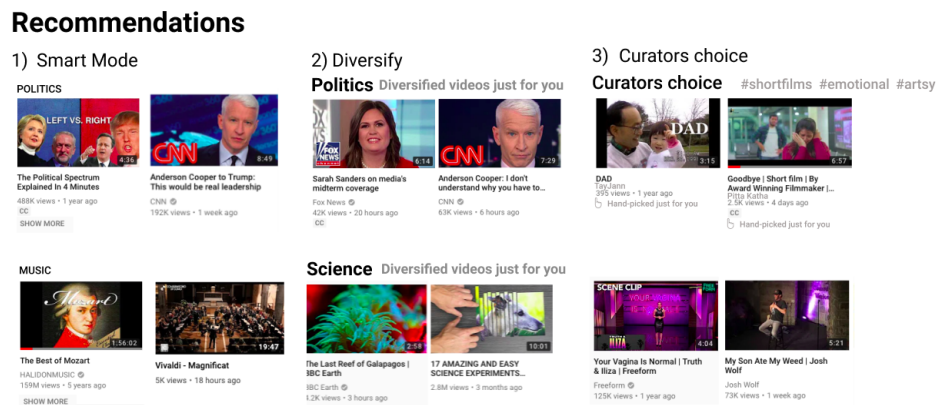


Figure 3.1: Three of the alternative designs we used in our interviews. Each design was a provocation into a different way that the algorithm could work showcased by what videos it would recommend under those conditions. The conditions are 1) Viewers are only recommended “smart” or educational videos. 2) Viewers are shown content they don’t normally click on. 3) Promotes videos that YouTube human curators, who select for more artistic content, have chosen.

prompt participants to imagine a different YouTube and learn how they form understandings of how a new algorithm operates and affects them.

Another exercise we used was card sorting [24]: Participants sorted features of the YouTube algorithm by speculated importance (e.g. thumbnail, click through rate, length of video, etc.) and added features they believed to be important that we had missed. After, we asked participants to re-sort the features by how they would want the algorithm to operate. We did this exercise after asking our initial questions and before showing and discussing the prototypes. The card sorting exercise proved to be an effective ice breaker. It met participants at the level that they usually were when discussing the algorithm and eased them into a more complicated and abstract discussion of the algorithms behavior and imagining alternatives.

Toward the end of our study we sought to understand how much each of the themes that we had found resonated with a larger group. We used a wiki survey to do so [59, 29]. A wiki survey is a collaborative form of survey in which participants are asked to collectively rank a set of ideas. At each point a participants is presented with two competing ideas, in our cases two themes of algorithmic personas, and asked to choose which one they prefer or to add a new one. We launched a wiki survey based on the results of our field work and posted it to YouTuber forums and subreddits in March 2019. We asked survey takers to vote on what roles they believe the YouTube algorithm plays, and to add new roles as well.



## Content Analysis

Our second source of data was native formats of information sharing online. We watched videos of YouTubers talking about the algorithm on the platform. Additionally, we reviewed information available online about VidCon, the major convention for YouTubers and YouTube forums (e.g. yttalk.com) and subreddits (e.g. /r/NewTubers, /r/YouTubeCreators, and /r/PartneredYoutube).

We analyzed YouTube videos of YouTubers speaking about their understanding of the algorithm [18]. Two members of our team searched YouTube for the phrases: “YouTube algorithm”, “YouTube algorithm explained”, “YouTube algorithm hack”, and “YouTube algorithm rant.” We used two criteria for choosing videos 1) it must be produced by a hobbyist content creator (as we defined as someone with under 1 million subscribers) 2) describe an individual’s understanding and perception of the algorithm, not just known technical details. We watched videos, took detailed notes and quotes, and exchanged our findings frequently until we reached theoretical saturation. In total, we watched 245 minutes of content, across 11 unique creators. As of April 2019, these creators had between 11,000 to 646,758 subscribers (average = 264,432, median = 221,000).

We also analyzed information available online about VidCon- including the program and recorded sessions about the algorithm. Vidcon is an annual video conference started by popular YouTubers and brothers Hank and John Green in 2010. It has since grown to an international convention where thousands of YouTubers meet yearly in the US, Australia, and the UK. VidCon is an opportunity for creators to meet each other in person, learn from successful YouTubers, and gain insider secrets from industry leaders.

## 3.3 Data Analysis

We engaged in an iterative, collaborative process of inductive coding to extract common themes that repeatedly came up in our data. After completing the interviews we met weekly and discussed themes and concepts as we continued our fieldwork. We conducted a categorization exercise in which we physically laid out themes and relevant quotes into emerging categories (Figure 3.2). Some of our initial categories included attitudes and feelings towards the “algorithm”, content creators’ behaviors, their mental models, and algorithmic fairness. We used Dedoose, an online tool for open coding, to map data onto these categories. Each of two first authors independently coded half of the data. Through the open coding phase, the category of content creators personifying the algorithm was the most pervasive, occurring in all of our transcripts.

To analyze responses from our wiki survey we use the analysis function on allourideas.org which we also used to collect the data. We posted the wiki survey on the subreddits: /r/NewTubers, /r/YouTubeCreators, and /r/PartneredYoutube, as well as the YouTube forum: YTTalk and a Facebook group: Small YouTuber Zone. As of April 4th, we received 572 total votes, and 43 unique voters. We seeded the poll with 6 themes from our field

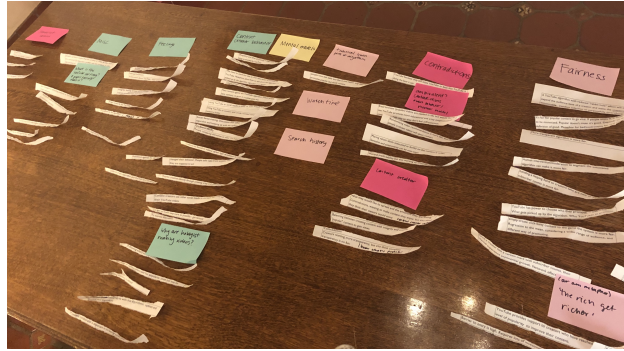


Figure 3.2: Categorization exercise of interviews and content analysis

work and participants added 6 new ones. Participants added 11 ideas. The analysis process uses responses to construct an opinion matrix, and summarizes that matrix to calculate the probability that any one response would be chosen over a randomly chosen option [59]. This is the standard method for analyzing wiki surveys in prior literature [29].

# Chapter 4

## Results

In this chapter, I will discuss how YouTubers use algorithmic personas to make sense of the algorithm, and how they perceive and want the platform to change.

### 4.1 Algorithmic Personas

Our research provides strong evidence that content creators make sense of the YouTube algorithm through three distinct personas: Agent, Gatekeeper, and Drug Dealer. They invoke characteristics of these personas when managing their relations with the algorithm, rationalizing algorithmic outcomes, deciding on courses of action, and engaging in conversations with other content creators. Table 4.1 shows themes that we found for each persona and scores that content creators assigned to them in the final wiki survey. In this section we will explore the shapes of these personas, their characteristics, and specific instantiations of their use. Quotes from YouTubers we interviewed will be denoted by P1, P2, etc. and quotes from YouTube videos will be denoted by Y1, Y2, etc. We also differentiate an algorithmic persona from a real world human role by capitalizing the word Agent, Gatekeeper, or Drug Dealer. In the discussion chapter, I will explore how personas can guide both the design of algorithmic systems as well as our understanding of the roles algorithms play in the real world and their ethics and politics.

#### Algorithm as Agent

When invoking the persona of algorithm as Agent content creators focused on the algorithm as it relates to them personally, similar to a talent agent. An agent is a familiar role for creative professionals. The most distinct characteristic of the algorithm as Agent is that it is perceived as scanning, choosing, and promoting individual people’s channels:

*“the YouTube algorithm blessed Emma’s soul because I don’t even know” (Y6)*

Table 4.1: Algorithmic Personas. For each algorithmic persona we list three to five descriptions that categorize that persona. Each description has a score from 0 to 100 assigned to it through a wiki survey we ran on All Our Ideas ([www.allourideas.org](http://www.allourideas.org)). We seeded the wiki poll with descriptions of persona gathered from our interview data. Descriptions marked with a \* sign were added by participants in our poll.

Persona	Description	Score (1-100)
<b>Agent</b>	A partial judge that will decide if your video will get promoted or not*	66
	A restrictor of creativity fueled by the ever changing community guidelines*	35
	A talent manager that helps the content creator grow their channel	26
	A regulator who makes sure people don't grow too quickly on the platform*	26
<b>Gatekeeper</b>	A curator that decides what will and will not be seen by the viewers*	73
	An explorer that helps viewers find relevant content	58
	A gatekeeper between the content creator and their viewers	56
	A prejudged supplier of content you may or may not be interested in	49
<b>Drug Dealer</b>	A strategist for increasing user engagement with the platform*	60
	An impartial judge that scans your preferences and gives you more things to watch*	47
	A drug dealer that encourages viewers to stay on the platform	47
	A gambler betting on videos for the most views	39

When an agent-talent relationship is successful the agent supports the talent by providing them with coveted gigs and the means to grow. In the same way, the algorithm as Agent supports a creator by showing a creator’s content to large audiences and building a bigger following for them:

*“YouTube will **favor** you in the algorithm which would then lead to more views and more subscribers” (Y1)*

Content creators discussed the importance of trying to understand and build a working relationship with the algorithm as Agent:

*“you wanna be friends with the YouTube algorithm which decides to push your video or not” (Y6)*

### Creative Freedom

The value of artistic or creative work is subjective and an agent follows their intuitions in selecting which talent to promote. Thus, the decisions of the algorithm as Agent can seem whimsical, irrational, or incomprehensible:

*“[The algorithm is a] mystical thing that has a way of picking what videos pop up on recommended page or if people search for your videos, [the] algorithms decides which video comes up first. [...] Don’t know how it works. Some channels have meteoric growth, not clear why that channel **was chosen**” (P2)*

An age old tension between artists and their agents has been the freedom of artistic expression. Similarly, one of the aspects that creators wanted in the algorithm as Agent was allowing them to pursue their passion freely. The algorithm as Agent is sometimes seen as allowing creators to make content they enjoy:

*“This algorithm at least allows me to make whatever content I want” (P4)*

In other cases, creators complained about having to transform their work style to fit into the Agent’s tastes and expectations:

*“The algorithm forces you to constantly produce content. So you can’t be like I’m going to do a short film and take a break for like a month and a half because short films take time. You can’t do that. You are going to lose hundreds of thousands of followers and you are not going to make money.” (P1)*

Content creators described the tensions inherent in any talent-agent relationship and their efforts to stay true to their identity:

*“I’m not trying to sell a text or thumbnail or type of video that is going to go viral but more trying to sell who I am as a person.”(P3)*

Overall, sometimes the Agent was perceived as collaborating with a content creator to help the creator succeed, other times it frustrated creators on how it promoted certain creators over others. We found many of the complicated dynamics of the YouTuber-Agent relationship emerge in our fieldwork: *“I’ve never officially broken up with YouTube” (P1)*

## Algorithm as Gatekeeper

Another way YouTubers understood the algorithm was through the lens of a gatekeeper. This persona mostly framed the algorithm as standing between content creators and viewers and allocating views to videos.

The algorithm as Gatekeeper decides what content viewers see and content creators must learn to play by its rules:

*“If you just walk into it and are naive about it and just want to share your thoughts on this topic because you want to, then I don’t think it’s going to reach a broad audience because there is [an] algorithm between you and the viewers. You need to try to understand the algorithm and play to its strengths, or kinda get really lucky.” (P2)*

Gatekeepers have a great deal of power to decide how to allocate resources, in this case views. With the algorithm as Gatekeeper content creators felt similar power dynamics and a *“need to figure out where I fit in the algorithm” (P4)*:

*“all the videos you see on YouTube are at the mercy of YouTube’s algorithm” (P5)*

In general content creators reacted negatively to the perception of the algorithm deciding for people what content they would like to see. For instance, in 2018 YouTube announced that they were planning on experimenting with the subscription feed. This meant viewers would no longer have all of the content by YouTubers that they had subscribed to show up on their subscription feed. This caused outrage by YouTubers as they viewed the Gatekeeper as becoming even more powerful [80]:

*“YouTube trusts its own understanding of you based on your watch history more than it trusts you telling it what you like [...] the algorithm gets a little bit more confident about its understanding of you the user, users like you, and who the video that you watched might appeal to in the future” (Y2)*

When thinking of the algorithm as Gatekeeper, content creators tried to understand what the Gatekeeper’s priorities are and to fit themselves into that space in order to create the videos that would be *“systematically chosen by YouTube on whether or not they will get views” (Y5)*. Sometimes this meant following trends:

*“I ended up getting a lot of views because I actually piggybacked a very popular trend at the time” (Y5)*

The algorithm as Gatekeeper has the power to decide what type of content goes viral on the platform:

*“Makes you wonder what kind of content they make, and if YouTube wants to make that content popular” (P4)*

This creates a perception that content creators are dealing with a powerful intermediary:

*“You are not competing with other YouTubers, you are competing against the system. That’s the key to victory at the end of the day” (Y7)*

Some content creators did not agree with the Gatekeeper’s priorities:

*“I would like it to be more diverse, there a lot of people out there, a lot of content that should be seen [and is] more interesting. Bring back making content just for the heck of it as opposed to what’s most popular” (P7)*

Overall, the YouTuber-Gatekeeper relationship was characterized as working to understand the Gatekeeper’s current priorities and fit in. The most salient theme in this relationship was the power imbalance, with YouTubers feeling themselves at the whim of the Gatekeeper.

## Algorithm as Drug Dealer

The two personas described above focus on the algorithm’s relationship with the content creator (Agent) and the algorithm as standing between videos and views (Gatekeeper). There was a third persona that people frequently mentioned that is not as familiar in the world of creative production: that of a drug dealer. The algorithm as Drug Dealer has one goal: keep viewers on the platform for as long as possible, in a way by making them “addicted” to YouTube:

*“the algorithm is really good at keeping us here” (Y2)*

Or by automatically playing the next video when a video is finished:

*“Autoplay is the default - hate it. You can’t turn it off in any setting. [It’s] disrespectful to people using the platform” (P3)*

The algorithm as Drug Dealer persona does not have a direct relationship with content creators but still helps them make sense of the algorithm’s behavior. The algorithm as Drug Dealer wants to promote creators whose content maximize watch time:

*“YouTube will favor you as a content creator because you are encouraging people to stay on the platform for longer” (Y1)*

Content creators often described the Drug Dealer’s actions as myopic, trying relentlessly to serve more videos that the viewer might watch right away even if that meant limiting their options:

*“[The algorithm] puts you in a bubble. [It doesn’t] show you other things” (P7)*

There were also concerns that the algorithm as Drug Dealer pushes content creators into producing high rates of clickbait content and the long term impact of that:

*“People who know how to make their videos clickable. Not making content that is impactful, not life-changing, just whatever will grab people’s attention” (P7)*

Overall, the algorithm as Drug Dealer was one of the ways that content creators made sense of the worst of the algorithm’s behavior. They also shared their frustrations about specific YouTubers who they viewed as having “hijacked” the system and profited off of this persona.

It is important to note here that while these three persona — Agent, Gatekeeper, and Drug Dealer — have distinct goals and characters, they also overlap. We sometimes came across content that we could imagine as fitting more than one persona. The value of the personas is in the ways that YouTubers use them to make sense of the algorithm, describe their emotions toward it, and choose their own courses of action in relation to it.

## **Personal Experience and Collective Sense Making: How YouTubers Craft Personas**

How do content creators come up with these understandings? We found that they rely on their personal experiences of what they believe makes their content gain traction, as well as through discussing their understandings with fellow YouTubers.

Creators take note of when their video gets attention from viewers and make post-hoc hypotheses of how the algorithm operates. For instance in analyzing the algorithm as Drug Dealer one content creator described how their content gets pushed to viewers to elicit a reaction:

*“I posted a video about Asian fetishes and I still get comments three years later. People hate it. Maybe that’s what YouTube is pushing. Videos where people get offended.” (P1)*

Discussing the algorithm with other YouTubers is another way creators make sense of the algorithm:



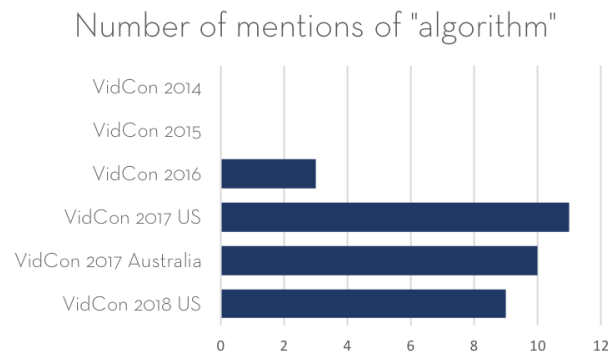


Figure 4.1: Interest in and discussion about the YouTube algorithm has increased in recent years. This graph shows the number of times the word “algorithm” was mentioned in VidCon programs that were available online.

*“I hear a lot via online platforms. I am so invested in the community so I hear a lot. I have friends that make content online. Girls night out, we talk about algorithm. [The algorithm] becomes so integrated into your life. ” (P1)*

VidCon is another one of the spaces that YouTubers have created to engage in mutual aid, collective sense making and to socialize and have fun. In recent years talk about the algorithm has become a staple of the event with full session devoted to it (Figure 4.1). At the 2018 Vidcon, a YouTuber gave a presentation describing techniques and strategies to succeed on YouTube, as well as their technical backings from an academic paper published by Google researchers on deep learning and recommendation systems (Figure 4.2). This presentation, and the existence of the convention itself, motivates the fact that YouTubers care deeply about their work and the ways that the algorithm affects it.

*“Why did I go to VidCon Australia? I went there to meet new people first of all. I went there to try to understand YouTube better [...] feel like I’m really really terrible at like tagging videos and knowing about like the algorithm oh my gosh.” (Y9)*

YouTubers are at the forefront of people having to engage with complex, opaque algorithms as part of their work. Our research shows that they are increasingly engaged in strategies for making sense of the algorithm. One of those strategies is personifying the algorithm.

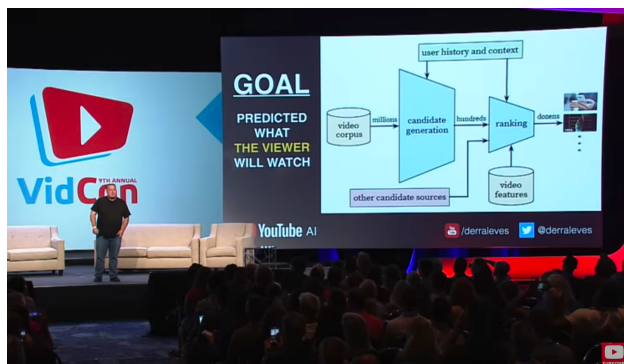


Figure 4.2: A presentation at VidCon 2018 titled “How Does the YouTube Algorithm Work in 2018”. The speaker is a YouTube content creator who describes the algorithm to an audience of other YouTubers using available statistics (e.g. Average View Duration), personal experience, and results from A/B tests on his own channel. In this screenshot he is discussing an academic paper published by researchers at Google [21] that describes the “dramatic performance improvements” to the YouTube algorithm through deep learning. We saw this paper referenced repeatedly as one of few windows provided into the technical workings of the algorithm [31, 27].

## 4.2 Perceptions of the Algorithm

During our research, we learned YouTubers’ understandings of the technical workings of the algorithm, what content they believe is valued on the platform, and what they want changed about the platform. During our in-person interviews, through a card sorting exercise, we asked our participants to rank features of YouTube videos from least to most important to the algorithm. They believe watch time, the thumbnail photo, and video title dictate the algorithm the most. Table 4.2 summarizes all our findings. In addition, creators believe YouTube highly values sensationalist content. Creators also want a more diverse range of content and content creators represented on the platform. In this section, I will dive deeper into our participants’ perceptions and concerns about the platform. In the discussion chapter, I will explore the challenges facing the wider YouTube community and their technical implications.

### What Content is Valued on YouTube?

During our in-person interviews, we conducted a card sorting exercise to ease our participants into discussing the YouTube algorithm at a more abstract level. However, I wanted to note the results of this activity summarized in Table 4.2. Resoundingly participants rated watch time, the thumbnail photo, and video title as the most important features of a YouTube

Table 4.2: Ranked algorithmic features. Through a card sorting activity, we asked our participants to rank speculated features of the YouTube algorithm from least (1) to (10) most important for determining the success of a video. Features marked with a \* sign were added by participants during the card sorting activity.

Features	Median Rating	Average Rating
<b>Watch time*</b>	10	10
<b>Thumbnail photo</b>	10	9
<b>Video title</b>	9	8
<b>Target audience*</b>	7.5	7.5
<b>Video collaborations*</b>	7.5	7.5
<b>Number of views</b>	7	6.8
<b>Number of likes</b>	6	6.4
<b>Video length</b>	5	5.6
<b>Tags</b>	7	5.4
<b>Comments</b>	6	5
<b>Video content</b>	4	4.4
<b>Video description</b>	4	4.2
<b>Time posted</b>	3	3.6

video. They consistently rate the video contents, video description, and time posted as least important. This follows participants’ observations that viral videos tend to be:

*“Crappy clickbait unilateral videos that are very flashy.” (P3)*

Creators use clickbait (attention grabbing) titles or thumbnail to misled viewers into watching their videos.

Participants believe that the YouTube algorithm favors creators who stir up controversy because it causes viewers to click, driving up views and consequently ad revenue:

*“[YouTube] prioritizes people that create the most drama. [You] can’t be big unless you do something crazy like Jake Paul” (P1)*

Unfortunately, controversial or silly actions do bring people to the platform, causing creators to think views are the most important metric on YouTube:

*“Views - Everyone wants to have the most views, and the most subscribers. Unfortunately because of this YouTube has lost quality in videos, and is now about quantity and not quality.” (P4)*

Although some participants thought the quality of videos are going down due to clickbait, one participant thought successful videos actually show a more personal side of a creator:

*“YouTube is very personal — people show the raw side of themselves, and say things they wouldn’t say in person.” (P2)*

Recently, Emma Chamberlain, a 17 year-old YouTuber, has “blown-up” on YouTube. Since starting her channel in June 2017, her channel has grown to close to 8 million subscribers, a feat not easily accomplished [5]. She’s well known for her personality. Chamberlain drinks loads of coffee, goes thrift shopping, and is a bit socially awkward, all of which make her relatable to teen girls her age. Chamberlain lets her personality shine through her videos, and that has helped her grow on the platform. Creators like Chamberlain bring hope to the platform — that you don’t need to be controversial to be successful.

Overall, YouTubers are concerned about the health of the platform. They believe YouTube’s algorithm prioritizes sensationalist content, compromising the quality of videos for views.

## How do Creators Want the YouTube Algorithm to Change?

Given how frustrated creators are towards the algorithm, we wondered: how do they want the algorithm to change? Our participants want the algorithm to value creativity and originality, YouTube to promote small creators, and recommend diverse content. Using Figma, an online collaborative design tool, I mocked up prototypes motivated by their feedback. We asked participants to rate their favorite designs, and 2 participants enjoyed the “Friends” prototype the most, 1 the “Diversify” prototype, 1 the “Curator” prototype, and 2 the “Up-and-coming” prototype shown in Figure 4.3.

Some participants enjoyed the “Friends” prototypes because it enables them to experience videos with friends, while hopefully exposing them to new content:

*“It’s super cool to watch a video at the same time and have a commentary with your friends. Hopefully it will expose me to cool content.” (P8)*

However, one participant felt that the “Friends” prototype was problematic:

*“This is terrifying... If people can see what creators are watching it could create controversies! I could see it blowing up with the current climate — it wouldn’t help content creators.” (P1)*

Participants who enjoyed the “up-and-coming” prototype noted that it was fair, helping smaller creators reach a wider audience:

*“I love it, and it’s fair — you do the upfront work and get the initial audience, you prove you have worthy content, and YouTube can help you get to the next level.” (P2)*

But they also had questions and concerns about how YouTube decides who to feature:

### Participants Preferred Prototypes

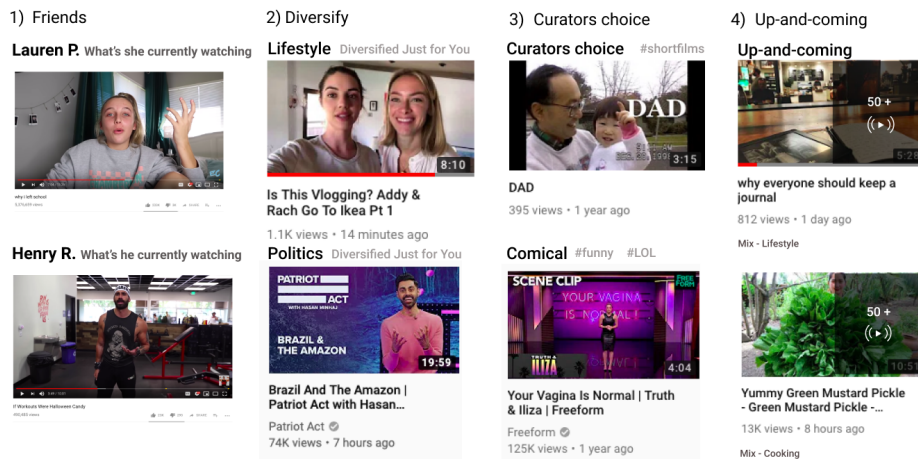


Figure 4.3: The four most preferred designs used in our interviews. The conditions are 1) Viewers see what their friends are watching and can join them in a live chat to discuss the video. 2) Viewers are shown content they don't normally click on. 3) Promotes videos that YouTube human curators, who select for more artistic content, have chosen. 4) Promotes small and up-and-coming creators on the platform.

*“So nice to find new people and be featured yourself — it gives smaller YouTubers a chance to be discovered. I would be interested to know how YouTube finds these people and features them?” (P1)*

YouTube has a similar feature called “Creator on the Rise.” Users can find the “Creator on the Rise” on the Trending tab. In our prototype, we featured “up-and-coming” creators on the top of homepage. For YouTube’s “Creator on the Rise”, there is no application process. The only criteria is that a creator has more than 1,000 subscribers. From there, the YouTube Team and systems review channels for their watch time growth, and how frequently they upload [72]. Participants like the idea of this system, but they wish there was more transparency in the process. Specifically, they want YouTube to give them feedback on what they could improve on to be selected.

Creators also expressed a concern about the platform lacking creativity and originality. With the “Curators” prototype, creators are exposed to more artsy content:

*“That is sick. Damn. I really like this... As humans, we are comfortable around what we know and what we like and there is nothing wrong with that. However too*

*much can be dangerous, and making an extra tab like this could be really useful.”*  
(P3)

As a viewer on the platform, creators also find themselves falling into “rabbit holes” of the same type of content. The “Diversify” prototype recommends content out of a user’s comfort zone, and creators found it a reasonable and healthy change:

*“[The Diversify prototype is] not such a huge change and it won’t kill you to look at other content.”* (P7)

We also ask our participants: In an ideal world, what would you want the YouTube algorithm to prioritize? Besides promoting creativity content and smaller creators, a participant suggested human usefulness, which the participant defined as:

*“[Content that] genuinely makes your life better. Examples of human usefulness are humor, and emotion — something that makes you cry. Also educational videos about science, humanity, and math.”* (P3)

Creators also wanted channels assessed on trustworthiness, passion towards their channel’s topic(s), and dedication towards enriching and supporting the YouTube community.

YouTubers perceive the algorithm as prioritizing clickbait and sensationalist content, making the content on the platform homogeneous. Creators want original and artsy content back on the platform, as well as a more transparent process in promoting new creators. They want to see content outside their usual clicking patterns. Creators want an algorithm that, as opposed to maximizing watch time and views, provides the greatest human value, creator credibility, and community value. Creators make YouTube the platform it is today, so we should seriously consider their feedback into making YouTube a safer and more creative space.

# Chapter 5

## Discussion

In this chapter I discuss how personas can guide the ethics and design of algorithmic systems, and the technical questions we can ask given the challenges facing YouTube today.

### 5.1 Working With (and Against) Algorithmic Personas

In this section I discuss the implications of algorithmic personas.

#### The Ethics and Politics of Algorithmic Personas

Framing our understanding of algorithms as personas allows us to make use of the offline context of those personas to better understand an algorithm's role in its current socio-technical context. Here, we analyze each of the three personas that we found in turn.

##### Algorithm as Agent

Most similar to the YouTube algorithm as Agent are talent agents in the entertainment industry. Talent agents have a stake in the financial success of the talents they represent as agents only make money when their talents do. Before the 1920s, there were no talent agents. However, as the movie industry grew and movies studios consolidated to a few powerful ones, it was difficult for talents to navigate the industry. Agents who advocate for talents sprung and spread, becoming a major stakeholder in the power chain of the entertainment industry [49]. Hollywood agents –though dominated by a few big agencies– still provide talents with a few options to choose from. However, the YouTube algorithm as Agent is the only option that YouTubers have which means that YouTubers are completely beholden to the the algorithm. More recently Multi-Channel Networks (MCN) have formed that collectively represent a number of YouTube channels as clients [22]. However these networks are mostly reserved for high profile YouTubers.

### **Algorithm as Gatekeeper**

Gatekeepers take many forms in the real world: job interviewers, college admissions officers, or a bouncer at a bar. Gatekeepers must make judgments and decisions about allocation of resources or opportunities. A gatekeeper is fraught with their own personal biases. The question of how much power do gatekeepers have? What are their decision making criteria? and how can those criteria be contested? are some of the open questions that also apply to the algorithm as Gatekeeper.

### **Algorithm as Drug Dealer**

YouTube is a for profit company which mainly earns revenue through targeted ads on videos. As a company, YouTube wants to maximize time spent on the platform so viewers will click and watch ads, generating more ad revenue. It has been successful at doing so and is the second most visited website in the world with the highest average visit duration of 22 minutes [74]. At this scale there are public safety risks that we need to consider. In the disturbing live stream video that has since been removed from internet, the Christchurch mosque shooter invited viewers to subscribe to the most subscribed individual on YouTube. His attack was engineered for virality, and meant to feed the extremist content on YouTube and the internet [7]. YouTube has been publicly criticized for recommending toxic content, for the sake of engagement [9]. YouTube's recommendation algorithm has also put minors at risk, recommending nightmarish knock-off versions of popular kid-friendly content [38], and enabling child predators to communicate with each other via the comments section [56].

## **Conversations & Contracts: Design and Policy Implications**

Analyzing the closest human equivalents of algorithmic personas is an effective conceptual tool in think about the design and policy implications of algorithms as they are used in the real world.

After decades of labor struggles many states require talent agents to procure professional licenses and regulate their business practices through legislature. For example, California's Talent Agency Act "prohibits agents from giving their clients false or misleading information concerning employment engagements; sending them to unsafe places." [89] There are cases where lawsuits were brought against talent agents in manipulating talents into accepting jobs for the sole benefits of the agent. In our research, we have learned that YouTubers, under the manipulation of the algorithm, modify their behaviors to "fit" themselves through the window of opportunity that the algorithm provides, sometimes compromising their own creative integrity and even personal safety (in the case of harassment). Here we need to respect the multi-faceted motivations of YouTube content creators including monetary, personal passion, and altruistic causes.

Legal measures in the offline world that are intended to protect the talents' interests are lacking in the world where the algorithm acts as an Agent. What would it look like for an



algorithm as Agent to procure a professional license in its role of locating employment opportunities for talents and to be regulated to protect the rights of talents? Another way talents interact with an agent is through a contract that specifies each person's responsibilities and liabilities. Could we introduce contracts between YouTubers and the algorithm?

YouTube content creators' anthropomorphic language in regards to the algorithm demonstrates the various human-like roles that the algorithm plays but the algorithm still isn't human. It can't understand the nuances a human gatekeeper could. This indicates a socio-technical gap which is caused by automating tasks traditionally carried out by humans without careful consideration of the differences between humans and computers. Humans make flexible and subtly different decisions based on context while computers build rigid and simplified models by aggregating similar but distinct situations [3]. Humans can act upon ambiguity implicitly, while computers often solve problems in a black or white manner and require explicitness [1]. We reference Ju and Leifer's implicit design framework, which aims to guide designers to consider the broad spectrum of interactions (from foreground to background, and from reactive to proactive) and to encourage modelling the human-to-human interaction when designing for human-computer interactions [37]. One human-to-human interaction is asking questions to learn people's intentions, asking for permission to do something that may affect them, and challenging them if we disagree. What if, for example, a creator could ask the algorithm why their video got demonetized? Explainability is already a value that researchers have called for, but what exactly the shape of those explanations might be is an open question that algorithmic personas provide insight to.

## Engaging Users in Discussions about Fairness

I embarked on this research not as an objective outsider but from the angle of redesigning the YouTube algorithm for fairness. This angle may have biased my questions and understandings of the situation.

For future directions, I plan to leverage participatory design to engage my research subjects. We will create more tools conceptually (e.g. personas) and physically (e.g. design provocations) to engage various stakeholders in algorithmic design. There have been calls for shared ownership and democratic governance<sup>1</sup> of these large scale platforms [42, 61, 62]. This is not possible without deep engagement and co-design with the people who would be participating in that governance.

I also plan to explore the implications for fairness. Definition of fairness vary depending on social, task and value contexts [43]. Viewing from the social context, YouTube content creators exemplifies a segment of population who are affected by the algorithmic decisions. Viewing from the value context, Lee et al. suggest that researchers should evaluate fairness of an algorithm not only based on its mathematical accuracy in distributing resources, they should also situate fairness among stakeholders' preferences and personal values. Hobbyist YouTube content creators' motivations go beyond simple monetary incentives. Algorithm

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<sup>1</sup>The Platform Cooperativism conference was founded in 2017.

designers should consider the rich set of values of the group they impact when designing for fairness [45, 44].

## 5.2 Challenges facing YouTube and their technical implications

Within the past two years of this research, YouTube has encountered some problems that have catalyzed change in the algorithmic workings of the platform, and content creators' relationships with the platform. A timeline of the major events is shown in Figure 5.1.

### Combating extremism

This past year, the meme “Subscribe to PewDiePie” went viral on the internet and the offline world. Since 2013, PewDiePie has been the most subscribed to channel on YouTube, however T-series, an Indian entertainment channel, has now overtaken PewDiePie's spot. The “Subscribe to PewDiePie” meme began as a way to increase PewDiePie's subscriber count. PewDiePie's fans have pulled off stunts, such as a themed parade in Estonia and a billboard in Times Square [70]. However, not all PewDiePie's fans' actions were benign. In March, a fan defaced a World War II memorial writing “Subscribe to PewDiePie.” [70] The graffiti has since been removed. That same month, an individual violently entered mosques in Christchurch, New Zealand, killing 51 people and injuring dozens of others in an Islamophobic attack [58]. Before opening fire, the shooter said, “Remember, lads, subscribe to PewDiePie.” [58] PewDiePie denounced both of these horrific actions. Regarding the Christchurch shootings, he tweeted, “I feel absolutely sickened having my name uttered by this person.” [70] This massacre was distinctly built for the internet. The shooter wore a helmet camera. He tweeted about the impending events, and live-streamed it to Facebook. The graphic footage was uploaded repeatedly onto YouTube, Reddit, and Twitter. YouTube worked relentlessly to delete all footage. The internet has many dark corners, and YouTube's recommendation system tends to push users to successively edgier content. Although the internet is not solely to blame, it does unfortunately play a role in provoking extremist beliefs and activities.

In April of this year, YouTube live-streamed a US congressional hearing about the rise of hate crimes and white nationalism. During the livestream, commenters in the live chat posted racist slurs about Jews and other minorities [48]. After 20 minutes, YouTube disabled the live chat feature on the judiciary hearing livestream [48].

In August of 2018, various tech giants such as Apple, Spotify, Facebook, and YouTube banned Alex Jones and his content from their platforms [20]. Alex Jones is a conspiracy theorist, most notoriously known for claiming the Sandy Hook shooting as a hoax. YouTube banned Jones' channel, which had accumulated 2.4 million subscribers, for violating community guidelines [20].

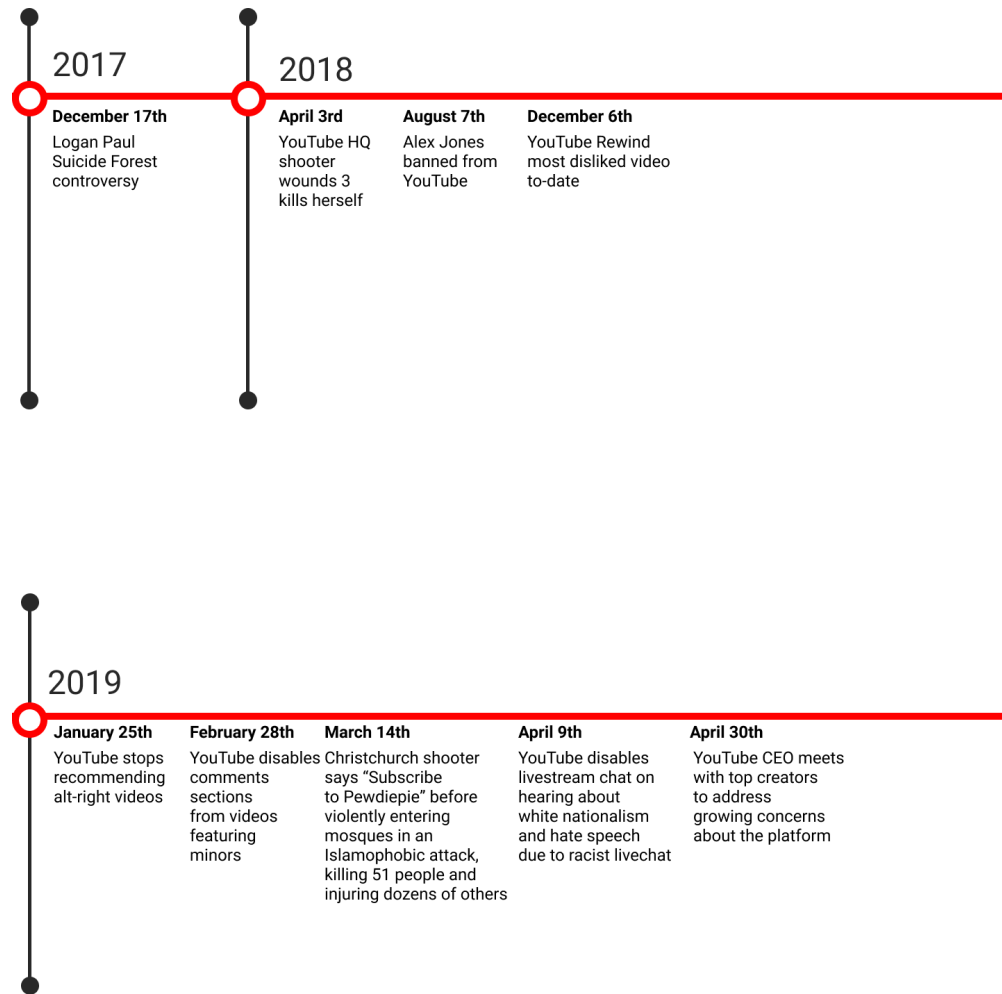


Figure 5.1: Timeline of some of the major challenges YouTube faced in 2017, 2018, and 2019

Alex Jones' ban and the rise of horrific hate acts and extremism have catalyzed YouTube's recent initiative to reduce recommendations of borderline content [71]. YouTube will not promote content that espouses harmful content, such as false information and conspiracy theories. Borderline content, videos that still fit within YouTube's community guidelines but contain hateful content, will still be accessible on the site, but will not be recommended

via the “up-next” or “home-page” features. In an interview with The New York Times, Susan Wojciciki, YouTube’s CEO, addressed some of the backlash YouTube has received regarding the surge of extremist content on the platform. She said, “It’s not like there is one lever we can pull and say ‘Hey, lets make all these changes’ and everything would be solved . . . That’s not how it works.” [79] Wojciciki stated that YouTube has hired thousands of human reviewers to examine problematic videos, and has also deployed new machine-learning models to flag extremist videos [79].

With 400 hours of footage uploaded every minute to YouTube, the job of flagging and reviewing videos is never ending [34]. In the last quarter of 2017, YouTube removed 8.2 million videos, most of which was spam or adult content [66]. 6.7 million of these videos were flagged by YouTube’s anti-abuse algorithms [66]. How is YouTube training their anti-abuse machine learning models? How can they add features that catch harmful content that doesn’t quite break the community guidelines? As opposed to disabling chats in livestreams, can YouTube build a chatting system that removes hateful comments and keeps the chat alive? Removing the chat feature takes away the opportunity for an enriching debate or conversation, which is unique to YouTube’s platform. Combating extremism is a challenging problem, and YouTube is working hard at training its machine-learning models to protect their viewers, but their solution isn’t quite perfect yet.

## **YouTubers’ toxic relationships with the platform**

In December of 2017, Logan Paul, a creator with 19 million subscribers as of May 2019, posted a video of himself and friends visiting the “suicide forest” in Japan [55]. They came across a suicide victim’s deceased body in the forest. Paul made inappropriate jokes and comments, posting the video on YouTube for millions of his young viewers to see. Paul received major backlash from his video; he was removed from Google Preferred and by consequence lost 5 million dollars in revenue [19]. Google, YouTube’s parent company, temporarily suspended ads on his videos in February 2018 [55]. In early 2018, a petition, now closed but signed by 725,000 supporters, circulated the internet advocating for Paul’s removal from YouTube [23]. YouTube took a stance, denouncing Paul’s actions publicly on Twitter and an email press release, and removed critical avenues of ad monetization from the YouTuber. YouTube recognizes the desire for views was the impetus of Paul’s reckless behavior, stating in the emailed press release: “Suicide is not a joke, nor should it ever be a driving force for views.” [4] Creators are hungry for views, lacking the foresight that some content is not appropriate for the internet, despite its potential to attract viewers. How can YouTube make a system that rewards thoughtful content over insensitive content and pure click bait? Currently, although YouTube is working to address this, click bait and otherwise unintelligible content go viral. That’s why creators post crazy content because they know they will be rewarded for it through views, subscribers, and consequently money.

On April 3rd, 2018, a shooter entered YouTube’s headquarters in San Bruno, California, shooting and wounding three employees [14]. The shooter shot herself, dying on the premises [14]. The shooter was a YouTube content creator. Her channels have since been

removed from the platform. She made singing and dancing videos in English, Turkish, and Farsi, and also discussed animal rights issues and being vegan [88]. At one point, she amassed 10,000 subscribers across her various YouTube channels [88]. According to an police investigation, the shooter was unhappy with YouTube’s policies and practices. The family informed police that she thought YouTube was “ruining her life.” [14] She claimed that YouTube actively reduced her view count, and began filtering her page and adding age restrictions to her videos [88]. Regardless if her claims were accurate or not, they do not justify her actions. The shooter developed an unhealthy relationship with YouTube, attributing her success, or lack thereof, to the company. However, what does this imply for creators’ relationships to YouTube? How do creators attribute their success to YouTube’s practices and policies? How can YouTube foster a healthy and clear relationship between its creators and the algorithm that dictates their work?

## **YouTube is disconnected to the creator community**

Starting at the end of 2010, YouTube launched a series called “YouTube Rewind.” The videos are an overview of that year’s viral videos, memes, events, trends, and feature YouTube content creators. YouTube’s rewind video for 2018 is to-date the most disliked video with 16 million dislikes [84]. The criticism was that the video did not accurately capture the creator community. Philip DeFranco, a popular news commentator on the platform, said in a video addressing the controversy, “Where is PewDiePie? Either him by himself or his battle with T-Series... Where is Shane Dawson, who had arguably one of the biggest series on YouTube this year? What about a reference to KSI and Logan Paul making one of the biggest pay-per-view events ever?” [2] DeFranco believes that either YouTube isn’t aware of what the real community is, or that they are intentionally distancing themselves from the controversies to present a more polished self. In a blog post, Wojciciki addressed the flop that was the 2018 rewind [84]. She said YouTube is going to prioritize the success of its creators. She wrote that YouTube is making strides in monetization, updating machine learning classifiers to make more informed decisions. YouTube has also released a new YouTube studio, so that creators can get more information on the performance of their videos, and the option to “Premiere” a video so that creators can create a shared experience with their fans.

YouTube is making an concerted effort to get back in touch with its creators and community, but it’s a challenge when creators and the platform’s policies are at odds. Take for example another major problem that happened earlier this year: pedophiles using the comment section to build a “soft-core pedophile ring.” [57] Pedophiles left time stamps in the comment section of videos where minors were in compromising positions. Users who viewed these videos would also be recommended more videos featuring minors due to YouTube’s recommendation system. To combat this, YouTube disabled the comment section on videos featuring minors. Colleen Ballinger, a popular YouTuber and known for her personality as Miranda Sings, was affected by the policy change. In her videos, she often features her newborn son. The comment section was disabled on some of her videos, and she took to Twitter saying, “So in my vlog today I talked about how YouTube is disabling comments

and demonetizing videos of innocent people instead of punishing the pedophiles who are commenting on them. MY VIDEO GOT DEMONETIZED AND COMMENTS ARE DISABLED JUST BECAUSE I CALLED THEM OUT ON IT. this is nuts.” [75] YouTube’s current solution is all-encompassing; any video that features a minor has its comment section disabled. Creators can ask for an appeal on the decision, but the time it takes for the YouTube Team to review an appeal is unpredictable [73]. Is there a solution where creators can have discussions with their viewers in the comment section, and simultaneously censor predatory activity? A main element of the creator-viewer relationship is communicating through the comment section, so when creators’ comment sections are disabled, creators feel disconnected to their community and censored by YouTube.

In an April blog post this year, Wojcicki announced that her top 2019 priority is to support creators [83]. Wojcicki spoke with top creators such as James Charles, Shane Dawson, and Safiya Nygaard about creators’ concerns with the platform. The YouTube community has been wanting clearer community and advertisement guidelines, so that creators can reliably predict monetization and better comprehend the recommendation system. Creators are also asking for diverse representation on the Trending tab. YouTube plans on providing more details in their community guidelines. She also states that YouTube has improved the accuracy of its classifier categorizing ad friendly content by 25 percent [83]. In terms of addressing the representation of creators in the trending tab, videos are screened for safety (profanity, nudity, violence), and once cleared are assessed on their “temperature” — how quickly it gains views [83]. YouTube’s goal is to have half of the content on trending come from YouTubers, and the other half from traditional media. She said they are also working on increasing the diversity of creators through expanding upon the Creator on the Rise and Gamer on the Rise initiatives.

## Technical Implications

As it currently stands, the only way creators understand YouTube’s policies and practices is through reading the community guidelines, and the limited statistics on their creator dashboard. How can YouTube design a solution that allows content creators to collaborate with the algorithm, understanding how it views and classifies creators’ videos? Could YouTube develop an online chatbot that facilitates communication between creators and the algorithmic workings of the platform? What other tools could YouTube develop to help creators succeed on the platform?

In terms of removing extremism from the platform, YouTube trains anti-abuse machine-learning models to flag and remove violent and hateful content [79]. YouTube has also employed thousands of human reviewers to flag content [79]. What other technical solutions should YouTube consider when combating extremism? Could they deploy a web crawler to classify content? Could they develop systems that screens content in the uploading process? Could they collaborate with other media platforms to curb extremism together?

YouTube is one of the most chaotic places on the internet. It’s already facing huge obstacles, but hopefully challenging YouTube’s solutions will make the platform safer and

thrive for generations to come.

### 5.3 Future Work

In my research, I interviewed hobbyist YouTubers, as well as analyzed video content from hobbyist creators. Most of these hobbyist creators are vloggers, who make lifestyle content. In future work, I'd like to explore how larger creators, and creators from different genres, make sense of the algorithm. Do they share similar perceptions and concerns as hobbyist YouTubers? If not, what perceptions and concerns do they have? Also, celebrities from the traditional media are becoming YouTubers. What are their motivations for joining the platform? What are their understandings of the algorithm as it dictates their work? Do they think they are immune to the algorithm due to their celebrity status? Finally, I'd like to dive deeper into YouTube's various strategies to curtail the spread of harmful content. Although YouTube does not disclose their machine learning systems, it would be interesting to investigate how other platforms approach similar situations, and how YouTube's approach should differ given the nature of its platform.

### 5.4 Conclusion

My research collaborators and I engaged with hobbyist YouTube content creators, individuals who are significantly impacted by algorithmic decisions, to learn how they make sense of the algorithm. We engaged in ethnographic field work and used design as provocation; we also sought to find people where they are by analyzing native formats of information sharing. Our study shows that hobbyist YouTube content creators crafted algorithmic personas to facilitate and augment their discussions in the process of collective sense-making of the algorithm. They assign anthropomorphic features and cultural values to the algorithm. We categorized our themes into three major personas that repeatedly came up: Agent, Gatekeeper, and Drug Dealer. An Agent promotes the content creator and procures employment for them. A Gatekeeper stands between the creator and viewers and decides which videos can get views. A Drug Dealer aims to keep viewers hooked on the platform for as long as possible. These three personas are multi-dimensional and there are overlaps among them. They act as conceptual devices that help content creators make sense of the algorithm's behavior. Through the lens of the algorithmic personas crafted by YouTube content creators, we can enrich our understanding of algorithms and their impact in the real world. We explore the design and policy implications derived from each of the three algorithmic personas. Algorithmic personas, invoking human characteristics in code-base algorithmic artifacts, enable designers and policy makers to design for human-to-computer systems with human-to-human relations as guides. Our study also shows that YouTubers believe the algorithm favors controversial content, and that watch time, the thumbnail photo, and the video title are the most indicative factors of a viral video. Creators are frustrated with the platform, hoping

that the platform will instead prioritize creative and original content, as well as recommend a more diverse range of creators. YouTube has faced major obstacles within the past two years; it has unfortunately become a hub of extremist activity and hate speech. Creators are also feeling helpless. YouTube now disables the comment section on videos featuring minors, and creators feel censored and ignored by the platform. Creators also experience reduced monetization due to unclear community guidelines. Creators' concerns and desires for the platform will hopefully enable engineers to challenge the algorithmic workings of YouTube, building a more inclusive, safe, and creative online community.



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