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The Artist's Code: Technology and the Optimization of Creativity in Hollywood

A dissertation submitted in partial satisfaction of the requirements for the degree of Doctor of Philosophy in Film and Television

by

Brandon Robert Green

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ABSTRACT OF THE DISSERTATION

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Doctor of Philosophy in Film and Television

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Professor Steve Anderson, Chair

This dissertation explores the intersection of technology and creativity in Hollywood since the 1990s to understand emerging ways of imagining, performing, and automating creative labor. Intended as a social and cultural corrective to the large body of economic-industrial accounts of media industry's "digital revolution," this work blends methods from production studies with those of digital media, science and technology studies, and technofeminist critique to probe the ideological tensions undergirding the convergence of Hollywood and Silicon Valley. It contains case studies analyzing: the history of computer-assisted screenwriting and the gendered labor dynamics embedded in writing software; streaming video service Netflix's extrapolation of big data analytics into a cultural belief system merging scientific and artistic ways of knowing; and the mapping of assumptions about creativity onto machine learning and generative AI technologies like Chat-GPT.

In tracking and historicizing the shifting influence of the technology sector on media arts, production methodologies, and media industry power dynamics since the 1990s, this dissertation argues for understanding contemporary media work as a balancing act between artistic and engineering sensibilities. Each chapter shows how beliefs about technology and its purpose, impact on society, and relationship to human agency are being adapted into persuasive industrial logics that justify contemporary ways of organizing, valuing, and supporting creative labor. In this way, Hollywood's varied approaches to technology-assisted creative processes are both symptoms of and adaptations to the cultural and economic conditions of a commercial landscape increasingly dominated by the tech sector, its priorities, and its preferred methods of problem-solving. Finally, this dissertation asks how discursive framings of computational technologies as instruments of totalizing rationality engage existing belief systems in Hollywood concerning who knows what about creativity, how they came to know it, and whether this knowledge can be profitable in the future.

The dissertation of Brandon Robert Green is approved.

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2023

Dedicated to Mom and Dad, Sandra Green and Robert Green.

Your support made my entire education possible.

You also never let me doubt I was making you proud in exploring my interests.

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Introduction

This project explores how the design, use and legitimation of computational technologies in media production since the late 1990s informs and gives structure to contemporary beliefs about the creative process and its imagined potential for optimization, streamlining, and mechanization. The chapters that follow describe multiple creative processes as they are strategically interpreted and instrumentalized by various, often competing agents in the media and technology industries in order to bolster specific standards of expertise. These simultaneously privilege specific technological frameworks, tools, and systems and their agents, including software developers, technology enthusiasts, labor organizers, screen- and other creative writers, media executives, studio managers, data scientists, machine learning researchers, marketing personnel, film and television producers, trade press reporters, and others. Ultimately, this project attempts to understand the implications of the convergence of Hollywood and Silicon Valley for the promotion of technologized solutions to creative problems. It does so by analyzing objects -- including tools, methods, mantras — where the people representing these cultural and industrial hubs collaborate to *design (for)* the creative process as it is made to fit the demands of the marketplace and media producers.

The discourses around these collaborative moments reveal how communities at the intersection of the entertainment and technology industries understand today's technology-driven media production work as a product of both the artist's and the engineer's sensibilities, skill sets and worldviews. The discursive interaction of these two symbolic figureheads — each encapsulating the traditions and ethos of their respective industries (the Hollywood artist, the Silicon Valley engineer) — serves as this project's major thematic through-line, particularly when it comes to determining which figurehead is seen as having the most to do with shaping the prevailing conceptions of "creativity" and "artistry." These terms, as well as the rationale for this project's association of "the artist" with Hollywood and "the engineer" with Silicon Valley, is described more below. Suffice it to say that this project uses "the artist" to highlight a recognizable and influential – extending well beyond the entertainment industry – model of creative labor associated with legacy Hollywood. As it appears within the following case studies, this model derives from an amalgamation of the stereotypical responsibilities, skills and values of the director, the writer, and the actor. To be clear, I am not suggesting there aren't other Hollywood figures whose roles signify something quintessentially "Hollywood" or even artistic to outside industries — I am thinking especially of positions such as producer, showrunner, or studio executive. The same goes for Silicon Valley, whose popularization of a specific brand of entrepreneur — notably white, male, irreverent, "disruptive" — continues to be extremely influential for all capitalist enterprises.

This project uses the relationship between "the artist" and "the engineer" as a contrived framework for understanding the new shape and character of media work; I believe there is much to be learned by studying the anxious negotiation between these models, which are at varying times used as instructive, didactic, and even moralizing models that advocate for technology-

based ways of knowing, decision-making, and problem solving. Moreover, this framework foregrounds the competing cultural and ideological threads in media work without locating and essentializing the artist/engineer sensibility within any specific individual. This allows this project to stand above the collapsing hierarchies, disappearing job titles, and transforming corporate structures while still tracking and accounting for these industrial shifts.

The following chapters show how beliefs about technology's purpose, its impact on society and culture, and its relationship to human agency are being adapted into persuasive industrial logics that justify contemporary ways of organizing, valuing, and supporting creative labor. In terms of media industry, this project argues that at any given moment, Hollywood's various beliefs about technology-assisted creativity are both a symptom of and an adaptation to the cultural and economic conditions of a commercial landscape increasingly dominated by the technology sector, its priorities, and its preferred ways of problem-solving. In a broader sense, this project asks how discursive framings of the totalizing rationality of computational technologies and their basis in the hard sciences engage existing beliefs in the entertainment industry about who knows what about the creative process, how they came to know it, and whether this knowledge will be profitable in the future.

This argument builds on ideas from multiple disciplines, whose individual contributions will be described in more detail below. But in the interest of summary: media industries and production studies scholarship provides a political-economic foundation for understanding the power dynamics already at play in the arenas where technological solutions and frameworks are offered as solutions; digital media scholarship provides historical context for these solutions and their animating philosophies, as well as useful terminology for dissecting the relationship between design and function; and cultural studies of science, mathematics, and computation

provide an intellectual framework that inspires this project's steadfast belief in the discursive power of scientific/technological metaphors and the social construction of expertise.

The periodization for this investigation (late 1990s-present) is motivated by the work of media industries scholars who have identified this period as marking a consequential shift in the creative, economic and labor conditions within Hollywood, specifically as a result of the incorporation of digital technologies into production workflows, distribution models, and systems of management. It is during this period that media companies revised or upended traditional business models and production methods to respond to the perceived affordances of digital technologies and competition from the internet as a source of entertainment. See, for instance, Denise Mann's work on television networks' efforts to reimagine the linear broadcast model in the early 2000s for newly networked audiences[1]; Jennifer Holt, Kevin Sanson, and Michael Curtin's work on the changing demands to media distribution infrastructures that developed out of new, multi-screen viewing preferences in the 1990s-2010s[2]; and Vicki Mayer, Miranda J. Banks, and John Caldwell's sketches of the transforming labor hierarchies and production experiences resulting from these industrial maneuvers towards "new media."[3]

That said, this period would not be of interest if it were not *also* part of the broader ascendancy of personal computing, high-speed Internet, mobile technologies, and social media in everyday society. The infiltration of digital technologies into daily life outside Hollywood serves

[1] Denise Mann, ed., *Wired TV: Laboring Over an Interactive Future* (New Brunswick, NJ: Rutgers University Press, 2014).

[2] Jennifer Holt and Kevin Sanson, eds., *Connected Viewing: Selling, Streaming, & Sharing Media in the Digital Age* (New York: Routledge, 2013).; Michael Curtin, Jennifer Holt, and Kevin Sanson, eds., *Distribution Revolution: Conversations about the Digital Future of Film and Television*, (Oakland, CA: University of California Press, 2014).

[3] Vicki Mayer, Miranda J. Banks, and John T. Caldwell, eds., *Production Studies: Cultural Studies of Media Industries* (New York: Routledge, 2009).; Miranda Banks, Bridget Conor, and Vicki Mayer, eds., *Production Studies, The Sequel!: Cultural Studies of Global Media Industries* (New York: Routledge, 2015).

as a critical historical context informing this project's readings of Hollywood's various orientations toward its self-proclaimed "digital revolution." In fact, this project argues that media industries' and the broader society's twin "revolutions," which in reality represent parts of the same whole, are used at various times as discursive tools to explain, conceptualize, and rationalize one another, sometimes as self-fulfilling prophecies. The ascendancy of personal computing and other digital technologies involved a parallel ascendancy of the related positions of the computer engineer, computer scientist, and "hacker." The well-known hacker "ethic" was famously documented by Steven Levy and further refined in Pekka Himanen's *The Hacker Ethic;* Himanen begins his study of what he calls "a general passionate relationship to work that is developing in our information age" by framing tech world's self-effacing, productivity-oriented work culture as explicitly contrasting concepts of Hollywood celebrity: "At the core of our technological time stands a fascinating group of people who call themselves *hackers.* They are not TV celebrities with their wide name recognition, but everyone knows their achievements, which form a large part of our new, emerging society's technological basis."[4] While in this case Hollywood is invoked as a bad object that fails to reward those who do the real, difficult work of advancing society, later Himanen relates hackers to "artists, artisans, and the "information professionals," from managers and engineers to media workers and designers, for example" through an intrinsic, passionate energy that directs their work lives.[5] As a sign of the broad diffusion of the "hacker" work ethic (including in media industry), the later reprint of Himanen's book includes: a new subtitle, *A Radical Approach to the Philosophy of Business*, a back cover passage suggesting "You may be a hacker and not even know it," since the term refers to those

[4] Pekka Himanen, *The Hacker Ethic, and the Spirit of the Information Age* (New York: Random House, 2001), vii.

[5] Himanen, *The Hacker Ethic,* 7.

interested in "harmonizing the rhythms of your creative work with the rhythms of the rest of your life," and a new cover blurb from the *Financial Times,* "A thoroughly spirited and commendable framework for human creativity." The latter differs from the technology-centric language and framing in the original publication, which posed the hacker ethic as the definitive "*Spirit of the Information Age.*"

I am hardly the first to identify the significance of the convergence of media industry with the technology industry, even at the level of creator cultures. Aside from media industrial accounts of conglomeration[6], ethical and political critiques of the irreversible dominance of tech platforms in society[7], explorations of the artistic and creative potentials of the intersection of cinematic and digital modalities[8], and arguments for reconceiving and redesigning media to circulate freely across digital environments[9], there have even been accounts from industry figures on the culture shock from the influx of tech world money and personnel in the 1990s. In 1999, media consultants John Geirland and Eva Sonesh-Kedar published *Digital Babylon,* which was an up-to-the-minute survey of various attempts by tech companies to work with Hollywood to produce internet-exclusive, interactive entertainment. These projects necessitated the collaboration of Hollywood and tech world talent to create websites and design digital infrastructures for allowing viewers to access the online-only content and contact the "characters" via email or chat portals. Geirland and Sonesh-Kedar identify a highly stratified

[6] Jennifer Holt, *Empires of Entertainment: Media Industries and the Politics of Deregulation, 1980-1996* (New Brunswick, NJ: Rutgers University Press, 2011).

[7] José van Dijck, Thomas Poell, and Martijn de Waal, *The Platform Society: Public Values in a Connective World* (New York: Oxford University Press, 2018).

[8] Holly Willis, *Fast Forward: The Future(s) of the Cinematic Arts* (New York: Columbia University Press, 2016).

[9] Henry Jenkins, Sam Ford, and Joshua Green, *Spreadable Media: Creating Value and Meaning in a Networked Culture* (New York: NYU Press, 2013).

working environment where the distinctions between Hollywood and tech workers are plain as day; explaining these distinctions, they write, "The denizens of new media could be divided into three distinct tribes — the geeks, the suits, and the ponytails...The geeks were the programmers and technologists who create the enabling technology, the Marc Andressens (co-founder of Netscape) of Silicon Valley" and are "consumed by technolust"; "The suits were the entrepreneurs, chief financial officers, investment bankers, attorneys, marketers," and other business-facing personnel, who "saw the Internet as an opportunity to move in and build new media empires"; Finally, "the ponytails" include "the writers, directors, producers, and artists who saw the Internet as a powerful tool for creating new entertainment experiences," who wanted to "break through all the geeky technology that stood between the artists and the audience."[10] This project tries to move beyond the tinge of sensationalism and simplification inherent to *Bablyon*'s popular press format, in part by recognizing the interaction of each industry's work culture, while appreciating that the book captures historically situated perceptions of technology's "geekiness", among other things, that certainly shape the discourses in this project.[11]

Literature Review: Technoculture in Media Communities

This project's argument and framework owe a great deal to scholars in media and production studies who have both 1) interpreted technologies used in the production of film, television, and other media as cultural artifacts and have 2) raised questions about the traditional boundaries between creative and non-creative labor in media production environments.

[10] John Geirland and Eva Sonesh Kedar, *Digital Babylon: How the Geeks, the Suits, and the Ponytails Fought to Bring Hollywood to the Internet* (New York: Arcade Publishing, 1999), 4–5.

[11] Especially in Chapter 1, which focuses on the same period as *Babylon.*

Specifically, in the first register, I share many of the same critical presuppositions as John Thornton Caldwell as outlined in *Production Culture* and *Specworld.* Beyond the obvious overlap in the methodological interest in cross-referencing moments of industrial "self-reflexivity" (including trade press interviews, public-facing or "behind-the-scenes" documentation of production work, and so on) with more straightforward media industry data and reportage, I try to extend Caldwell's critiques of technology use as "coded cultural performances" beyond the production set. In *Production Culture,* Caldwell returns repeatedly to this idea in his critical approach to "trade narratives," where digital technologies are used, for instance, as loaded discursive symbols for below-the-line, technical workers (categorized by Caldwell as camera operators, audio recording personnel, grips, gaffers, etc.) to use in "war stories" that rationalize and moralize the stress, technical knowledge requirements, and general hardships of the production experience. These narratives, which Caldwell links to specific "classes" of industrial worker, emphasize the physical demands and properties of media production technologies — the "suffocating heat and sweat, skewered sinew, and lost blood" that come with "the warlike conditions of location production."[12] My project focuses less on the embodied impact of digital technologies on production work and more on the way they structure or direct the mental labors of media work — though these ideological pressures to approach a creative task a certain way, according to seemingly prescribed values and priorities, can be felt and described as equally imposing and demanding as the on-set pains and discomforts. Even when Caldwell's interest in how technology signifies values, he remains focused primarily on Hollywood's production context — "the Steadicam, jib-arms, cranes, 35mm negative film mags, HMI "daylight lamp," and Panavision lenses all connote certain cultural assumptions on and off

[12] John Thornton Caldwell, *Production Culture: Industrial Reflexivity and Critical Practice in Film and Television* (Durham, NC: Duke University Press, 2008), 39.

the set: namely, big-screen production value, fluid movement, controlled performance, and the sense that the human workers on the set are there to follow and assist machines as the machines do their work, rather than vice versa…but also in the ways technologies on the set are used to establish, cultivate, and reinforce cultural ideas about the function and agency of the crew members there."[13]

This project wants to take this cultural analysis further, to understand how Hollywood's production context is itself influenced by technology's larger social and political connotative power. I would agree that, as Caldwell describes:

> The work task, worker status, worker interrelationships, and the cultural significance of work all change depending on how production technologies are used and why. Answering these questions means looking at technology design, trade explanations and representations of technologies, and the broad economic, cultural, and industrial contexts in which technologies are used.[14]

But my work attempts to expand the work area as it relates to "representations of technologies" and the "cultural contexts" of technologies, which is where the research of digital media scholars factors into this project's arguments. With *Specworld,* Caldwell creates space for this project's interest in the way technology shapes the ideals, values, and motivations of creative work by identifying the industrial mechanisms facilitating aspirational trends and other cultural movements within creator communities. The belief systems and culture of empiricism described in this project's chapters are certainly sustained by the Gen-Z-directed "de facto pre-college film school", identified by Caldwell as a critical site for the "front-loading of film/media production

[13] Caldwell, *Production Culture,* 152–53.

[14] Caldwell, *Production Culture,* 153.

training to the adolescent pre university years."[15] *Specworld* also recognizes the outsized influence of Silicon Valley or Valley-adjacent belief systems in directing media production work: "we may simply be too close to the flash and too enamored with the suspect terminology that tech companies have invented to "helpfully" frame this whole enterprise for those trying to make sense of it."[16] This project certainly advances the framing of creative aspiration as a logic that industry is constantly trying to manipulate and control — that "similarly to business schools, film schools and trade worlds push norms and creative conventions to make production one thing," in the interest of "sutstain[ing] coherent, rule-governed enterprises."[17]

In the second register, Vicki Mayer in *Below the Line: Producers and Production Studies in the New Television Economy* focuses on identity as a determinant of creativity, the broader social constructions of creativity as a form of professionalism in Hollywood, and "boundary maintenance" between various sectors and classes of media industry professionals. Her work creates the space needed for this project to track conceptions of "creativity" and "artistry" across segments of the industry, broadly interpreted. Her study of media production highlights television set-assemblers, reality casting personnel, soft-core video producers and other below-the-line workers as a way to reveal and challenge hierarchies of "creative" labor within the television production space (and the entertainment industry at large). These hierarchies, she writes, privilege certain kinds of labor over others through limited conceptions of creativity. "That, is, labor — the structural arrangements that extract value from work — contributes to specific social formations that have historically been the basis for establishing differences

[15] John Thornton Caldwell, *Specworld*, (Oakland, CA: University of California Press, 2023), xvi.

[16] Caldwell, *Specworld,* xvii.

[17] Caldwell, *Specworld,* xix.

between populations."[18] Writing from 2011, Mayer argues such conceptions require expansion lest they be sustained into the new media space. This project explores how creative labor represents not only a privileged class of workers but also an industrial ideal that increasingly incorporates a vision of technology use.

For understanding those visions of technology use, this project draws methodologically from work in digital media and software studies to try and apprehend the cultural and symbolic significance of technologies as they become essential components of creative work. This involves interpreting the use of technology-related metaphors, similes, structuring ideologies, and rationalizations. To this end I engage David Golumbia's concept of *computationalism,* which he uses to encompass a wide range of cultural beliefs about the power and influence of computers in society. Golumbia argues that computationalism, through its rationalism, common sensical rhetoric, and close relationship to institutional power "underwrites and reinforces a surprisingly traditionalist conception of human being, society, and politics."[19] I too see the initial liberatory, utopian potentials of media technologies and systems (in this case, screenwriting software, data analytics systems, and AI) as ultimately undermined and co-opted by industry to establish more efficient and, dependably, less labor-friendly ways of organizing creative labor. That this institutional power exerts itself through tools seemingly serving individual creativity speaks to Golumbia's observation that "computationalism meshes all too easily with the project of instrumental reason."[20]

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[18] Vicki Mayer, *Below the Line: Producers and Production Studies in the New Television Economy* (Durham, NC: Duke University Press Books, 2011), 17.

[19] David Golumbia, *The Cultural Logic of Computation* (Cambridge, MA: Harvard University Press, 2009), 2.

[20] Golumbia, *The Cultural Logic of Computation,* 5.

Golumbia's work sits alongside similar work by Phil Agre and Tarleton Gillespie and provides a critical framework for understanding how new technologies introduce not only new features and functions, but also "new" (rearticulated, revitalized, etc.) ways of knowing and preferences for approaching a given task. Gillespie describes a way for identifying these ideas as they are made actionable in technology design: "Inside [technology advertisements, instruction manuals, press descriptions, etc.], the significance and meaning of the tool is being interpreted, often by its own designers; this "self-interpretation" of what the tool does and what role it can play inside human activity, frames that activity — such that using the tool in these ways makes "sense," and other uses and purposes seem less familiar, less likely, less viable."[21] Without favoring the discursive impact of technologies to the point of determinism, or to the point where the material realities of a given tool or system is made irrelevant, I too focus on the ways such interpretations, by virtue of articulation in specific ways, by specific people, within specific power structures in the industry, have the power to bend beliefs about creative work to more closely resemble a desired vision.

Methodology, Labor Context, and Terms

The challenge of productively delimiting the meaning of "creativity," "artistry," and other related terms throughout this project becomes most difficult in the context of labor, which forms a critical historical context for this project even when labor is not the primary focus. As contemporary work is increasingly promoted and undertaken as an aesthetic enterprise, labor scholars are documenting how these terms — especially creativity — are being strategically deployed by both employers (for recruitment, morale, and management purposes) and employees

[21] Tarleton Gillespie, "The Stories Digital Tools Tell," in *New Media: Theories and Practices of Digitextuality*, eds. Anna Everett and John T. Caldwell (New York: Routledge, 2003), 6.

(to rationalize their experiences), often beyond the point of recognition. Feminist labor scholar Kathi Weeks describes how "the language of creativity is in some instances deployed as a synonym for labor, at least when it has the effect of not only selectively expanding what counts as labor but also elevating its status as a worthy human practice."[22] In this discursive context, where creativity can mean everything and nothing, but always in a constructive way, corporations seem content to offer (the potential for) creative expression in place of autonomy and security as the final stage of professional self-actualization, motivating at the same time as it undermines Weeks' determination to use work as "an arena in which to develop and pursue a freedom-centered politics."[23] Miya Tokumitsu begins her critique of American labor culture in *Do What You Love: And Other Lies about Success and Happiness* (2015) with a discussion of "the mythologies of artistic labor, as fueled by passion, genius, mental illness, faith, drug abuse, longing, mystical visions, and of course, love."[24] Tokumistu makes the humorous observation that Michelangelo hated painting the ceiling of the Sistine Chapel to foreground her argument that creativity and artistry are central pillars motivating the contemporary pursuit of pleasure and fulfillment through work, where the goal is to love what you do the way we imagine the great artists do.

My project references "creativity" and "artistry" in varying ways specific to their contexts. In Chapter 1's discussion of screenwriting software, creativity and artistry are observable processes that can either be facilitated or hampered by design choices embedded in digital tools. In Chapter 2's exploration of big data as a cultural logic, creativity and artistry are the prized

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[22] Kathi Weeks, *The Problem with Work: Feminism, Marxism, Antiwork Politics, and Postwork Imaginaries* (Durham, NC: Duke University Press, 2011), 82.

[23] Weeks, *The Problem with Work,* 23.

[24] Miya Tokumitsu, *Do What You Love: And Other Lies About Success and Happiness* (New York: Regan Arts, 2015), 2.

byproducts of a healthy, competitive, and technology-driven industrial climate; or else they are used as fresher-seeming variations on tech world notions of "innovation" or "vision" that seem capable of bridging the gap between the creatives and the engineers. And in Chapter 3's overview of artificial intelligence and machine-assisted creative production, creativity, artistry, and originality are deployed as conceptual reference points for evaluating the algorithmic processes behind generative AI. The slippage between these terms and their tendency towards overuse is a symptom of the cultural, industrial, and historical contexts discussed in these chapters.

While versions of "creativity" and "artistry" are frequently modified and imposed on the discourses described in this project, the same cannot be said for conceptualizations of "the artist," who is already seen as having an essential, privileged relationship to work and capitalist enterprise more broadly. The formulation of an "artistic critique" of capitalism in the mid-19th century drew its namesake and political impetus from the young, poor artists of Bohemian Paris — the land of "art, youth, the underworld, the gypsy life-style," where painters, writers, musicians, and actors worked to "make more of life than objective conditions seemed to permit."[25] According to Luc Boltanski and Eve Chiapello, the artistic critique "foregrounds the loss of meaning and, in particular, the loss of the sense of what is beautiful and valuable, which derives from standardization and general commodification" in the face of capitalism's crushing regimentation and objectivity.[26] Beyond invoking aesthetics, the artistic critique offers the artist as a model of a distinct kind of freedom unavailable to the materialistic bourgeoisie — a freedom

[25] Jerrold Seigel, *Bohemian Paris: Culture, Politics, and the Boundaries of Bourgeois Life, 1830-1930* (Baltimore, MD: Johns Hopkins University Press, 1999), 3–4.

[26] Luc Boltanski and Eve Chiapello, *The New Spirit of Capitalism*, trans. Gregory Elliott, Reprint ed. (New York: Verso, 2018), 38.

based in artists' "refusal of any form of subjection in time and space and, in its extreme forms, of any kind of work."[27]

The symbolic substance of "the artist" — as a figure whose existence and movement through society refutes or reframes capitalism's basic principles — continues to this day. But it does so in a complex social, political, and industrial setting that has become adept at appropriating opposing belief systems, like that of the artistic critique, that proceed from artistic notions of creativity, beauty, romanticism, and authenticity.[28] Not to mention "the artist" is no less vulnerable than these related concepts to reinterpretation and dilution by industry and mass culture. Thomas Frank's research on the advertising industry's "Creative Revolution" in the 1960s exemplifies how even the gray-flannel-suited ad men driving capitalism via consumer culture were able to reimagine themselves as artists, their commercials and copy as art, and their art as embodying a radical creativity motivated by the era's youth and countercultures.[29] In an intriguing resonance with this project, Frank's work also shows how "the artist" as a model of labor — understood by 1960s- advertising executives as creative, inspired, irreverent, nonconformist — has been used in the past by a community of media industry personnel to challenge a competing model based in science, rationality, and technical procedure. Advertising creative director Bill Bernbach's famous 1947 letter to his Grey Group agency bosses foregrounded a discursive contrast between the artist and the scientist and compared their respective abilities to innovate and produce insight. "There are a lot of technicians in advertising," wrote Bernbach, who would become one of the most influential figures in the

[27] Boltanski and Chiapello, *The New Spirit of Capitalism,* 38.

[28] Boltanski and Chiapello, 49.

[29] Thomas Frank, *The Conquest of Cool: Business Culture, Counterculture, and the Rise of Hip Consumerism* (Chicago, IL: University of Chicago Press, 1998).

ensuing decades' creative revolution. "They can give you fact after fact. They are the scientists of advertising...[but advertising] happens not to be a science, but an art." In neglecting the artistic demands of ad work, the industry's major players lacked "that creative spark," he continued, and rather than continue to mistake "technical skill for creative ability," Bernbach urged his managers to "prove to the world that good taste, good art, and good writing can be good selling."[30]

As workers across the knowledge economy are asked to take more active and demanding roles in constructing, shaping, and interpreting their working lives, conceptualizations of "the artist" are being made valuable as tools for reframing all work as creative, artistic and personally fulfilling (especially when it is not materially lucrative). This ubiquitous labor framework is one of the key sites where we can observe the far-reaching implications of the entertainment industry's constructions of artistry and industry. Sociologist Mickie McGee has tracked the influence of an "artistic mentalité" in career advice resources since the mid-1990s. Her work demonstrates the symbolic import of the artist as a model for a diverse array of work beyond the art world and entertainment industry. McGee sees mass culture's conception of the artist as an appealing antidote for an increasingly "demoralized, downsized, and otherwise dissatisfied labor force."[31] Paradoxically, it is *because of* the artist's (mistaken) reputation as unconcerned with their economic standing that allows them to serve as models for propping up a precarious, highly competitive labor market where workers move from one temporary position to another, where they enjoy little to no safety net, and where the burden of finding satisfaction in one's career is

[30] Ed Owen, "Bernbach's Letter to Grey," *Data & Marketing Association,* August 17, 2015, https://dma.org.uk/greatbritishcreativity/bernbach-s-letter-to-grey.

[31] Micki McGee, *Self-Help, Inc.: Makeover Culture in American Life* (Oxford, UK: Oxford University Press, 2005), 128.

placed entirely on the individual. McGee's analysis of career self-help literature reveals the following qualities of the artist that are appropriated in popular career advice: artists are "trained to work with symbolic forms, so they offer an ideal model for the newly christened "knowledge workers"; they "have been engaged in a pursuit of excellence for its own sake"; they "are accustomed to working without supervision"; they "find ways of motivating themselves even in the absence of compensation"; they "work out of their own workspace, thus shifting costs of overhead (space, office equipment, software, etc.) to the worker"; they "blur the distinction between work and pleasure"; and most of all they do their work "for little, or even no, financial compensation."[32] Interestingly, McGee distinguishes the artist model of work from what she calls the entrepreneurial model — while both the artist and entrepreneur are used to working without the promise of timely, adequate compensation, the entrepreneur "operates from an announced profit motive" and works on spec.[33] Today, speculative work is seen as inherent to the labor structures of the entertainment industry.[34] The rise of spec work in Hollywood thus contributes to the merging of the artist labor metaphor with those from other industries, like the technology sector, where cultures of entrepreneurialism appropriate creativity, artistry, imagination, and passion towards purely commercial ends.

This project's interest in the interface between Hollywood and Silicon Valley in the design, use, and implementation of digital technologies in creative work can be understood as trying to address the fundamental basis of "expertise" in Hollywood and creative communities as these technologies become increasingly essential to creative processes. Luci Marzola's *Engineering*

[32] McGee, *Self-Help, Inc.,* 129.

[33] McGee, 136.

[34] Michael Curtin and Kevin Sanson, *Precarious Creativity: Global Media, Local Labor* (Oakland, CA: University of California Press, 2016).

Hollywood astutely points out that Hollywood has always had a connection to the technology industry, in some cases serving as a site for technological innovation in its own right. Marzola's study, which discusses the technological infrastructures that paved the way for the creation of the studio system in the 1920s-, explores "the labs of industrial manufacturers, the sales routes of independent service firms, the garage of tinkerers, and the clubhouses of technicians's societies" in an effort to "reorient our understanding of the motion picture industry to one fundamentally built on the sharing of technological knowledge."[35] Marzola's work reclaims the engineering traditions within Hollywood and underlines how the periodization for this project represents a smaller segment of a much longer history of the artist/engineer binary.

In the debate over technological solutions to creative problems, we can observe a negotiation of various forms of expertise between creative and scientific domains, based in equally varied standards of judgement, intellectual "jurisdiction," and decision-making values. Ian Hacking and Theodore Porter have previously written about the intoxicating, totalizing rationality of statistics, mathematics, probabilism, and empiricism in informing the contemporary, social construction of expertise and objectivity. These same fields form the basis of the technologies described in this project and/or are directly referenced as models for their design and use. Others, like H.M. Collins, have written about how computers and artificial intelligence systems specifically invite the same kind of rarely-asked questions, "misplaced confidence" in their mediation of knowledge production. Emphasizing that technological systems are simply parts of a larger social construction of expertise, Collins makes a suggestive reference to overlap between scientific and creative knowledge: "Building scientific knowledge is a messy business; it is much more like the creation of artistic or political consensus than we

[35] Luci Marzola, *Engineering Hollywood: Technology, Technicians, and the Science of Building the Studio System* (New York: Oxford University Press, 2021), 2–3.

once believed. The making of science is a skillful activity; science is an art, a craft."[36] I believe this project points to the ways creative work, specifically media production in Hollywood, is increasingly resembling a "subgenre" of popular science discourse that helps make sense of technological innovations (data analytics, data tracking, generative AI) and the possibilities for creativity and inspiration can be mechanized and automated. Critically, in order to function as a distinct discursive genre of popular science discourse — which are always being "invented, redefined, and fought over" in the public imagination[37] — media industry must establish the industrial and social conditions that allow it to represent some legitimate questions or tensions in more established scientific communities.

Chapter Summaries

Chapter 1 explores how screenwriting software served as a symbol of real and imagined changes to the artistic and industrial conditions of screenwriting in the early period of Hollywood's digital age, considered here from the late 1980s into the 1990s. While mundane by contemporary standards, screenwriting software as a product category was once passionately contested in the Hollywood trade press, screenwriting journals, and public discourse. The struggle to define software's potential role in screenwriting labor recruited the input of communities then considered outside the entertainment industry proper, including software designers and programmers, who, along with their technical knowledge, brought with them to these discussions their philosophies on creativity, innovation, and the ability of technology to assist in both. Claims that a computer could make someone a better, more creative writer were the focal point of most

[36] Harry Collins, *Artificial Experts: Social Knowledge and Intelligent Machines* (Cambridge, MA: MIT Press, 1992), 3.

[37] Peter Broks, *Understanding Popular Science* (Maidenhead, Berkshire: Open University Press, 2006), 1.

screenwriting software advertising campaigns and were, perhaps by design, the most provocative ideas among screen- and other creative writing traditionalists. Examining such discussions in detail reveals the extent to which skeptical screenwriters, working and aspiring, understood writing and other creative tools' propensity to *shape* and *prescribe* the work such technologies claim merely to facilitate and enhance. The objects of most interest for this exploration include reviews, editorials, letters-to-the-editor, and advertisements found in screenwriting journals — though a good portion of the material comes from the *Writers Guild of America, West Journal* (renamed *Written By* in 1997).

Chapter 2 explores the intersection of technology, science and culture in Hollywood. It explores what I am calling Hollywood's "culture of empiricism" in an effort to contextualize and further historicize the growing body of research on data analytics in the entertainment industry. I contend that the supremacy of "big data thinking" within contemporary media production cannot be fully understood or explained without asking why studios, networks, online media companies, streaming services, and even individual creative workers consider computer science, engineering, and statistical analysis prudent models for media-making to begin with. This chapter looks at examples of entertainment media entities offering wide-ranging appeals to scientific rationality in justifying new production methods, management strategies, the use of new digital tools, and even creative decision-making procedures. Characterizing these appeals as products of a "culture of empiricism" is an attempt to highlight the historical circumstances in which appearing to be backed by science (broadly interpreted) is advantageous to media companies.

Chapter 2 investigates these questions through a deep dive into the research output and profile of streaming service Netflix, a company whose development and use of digital

technologies to improve film and media production have linked the company to the worlds of science, mathematics, and engineering in ways other entertainment companies have not yet achieved. I argue Netflix's relationship to science — as a marketing theme, a business strategy, a recruitment tactic, and other variations — is an adaptation to Hollywood's cultural and industrial conditions in the wake of the ongoing convergence of Hollywood and Silicon Valley.

Chapter 3 focuses on Hollywood's role in shaping discourses around machine-assisted creativity. The popular discourse around AI and its ability to be creative underlines how Silicon Valley can be seen as competing against Hollywood to control and define creative work. I argue that Hollywood has become a legitimate discursive force in popular science as a result of its relationship to Silicon Valley; likewise, Silicon Valley has expanded and permanently solidified its authority within creative and artistic circles through its relationship with Hollywood. This chapter explores instances where these shifting authorities are revealed and considers the ramifications for the future of creative work.

Specifically, this chapter focuses on the concept of training data set construction as a structuring metaphor underwriting a selection of popular theories of individual creativity — or one's creative "output." Training data sets are at the root of many of the key ongoing conversations around AI, including how sampling reinscribes social biases into the next generation of technologies. My primary interest looks at discussions considering whether AI's output constitutes plagiarism and, conversely, whether AI can ever truly produce original work. Both topics hinge on understandings of the relationship between input and output, a dynamic that also appears within advice aimed at working creatives and critiques of the essential creative process. Finally, this chapter considers how the concept of artistic influence and legacy becomes reframed in discourse around AI training data, where entire corpuses are devoured by machines,

stirred around in their black boxes, and made to form new connections, associations and expressions that demonstrate the existence and reach of certain ideas or artistic traditions.

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Chapter 1
It All Starts with the Script: Screenwriting Software and the Automation of Formatting

Imagine if, to become a prolific screenwriter, you had only to master *three* tasks: "Type the words that are in your head; Occasionally press Tab and Enter; Print and sell your script." Barring technical holdups with the printer, these instructions might seem achievable, even simple. Alas, you discover that such clarity of purpose can only be achieved through delegation, in this case to a $299 computer program called Scriptware.[1] A 1994 advertisement appearing in the *Writers Guild of America, West Journal* for the screenwriting software explains that in order to keep "All You Do" to write a script manageable and appealing, you need a program that will "automatically, as-you-write, and on your screen" take care of the innumerable *other* tasks required to produce a script, including setting margins, accurately numbering shots and scenes, checking for spelling mistakes, and ensuring, through these interventions, that your script looks passably "professional" for selling at a moment's notice.[2]

Visually, the advertisement underlines the discrepancy between the creative labor performed by the screenwriter and that performed by the software "automatically." The

[1] Scriptware, advertisement, *Writers Guild of America, West Journal* 5, no. 2 (February 1992): 13.

[2] Scriptware, advertisement, *Writers Guild of America, West Journal* 7, no. 7 (July 1994): 9.

condensed, 3-item "All You Do" list is crammed into a small square in the corner, while the "All We Do" list dominates the page with its 17 items, artificially, if not inaccurately, inflated to appear more impressive (consider the necessity of "And much more!" as item 17). Even in hyperbolic form, the message lands: software for writers is becoming increasingly sophisticated, and developers are directing this sophistication toward the goal of reducing the number of tasks screenwriters must manually perform during their work. The writing process can and will be improved through the increasing ability of software to re-prioritize, streamline, and automate.

The potentials of automation in screenwriting – as conceived by a specific class of products emerging in the mid-1980s and into the 1990s – proved to be an exciting topic not just among marketers, who spun off countless iterations of suggestive, techno-utopian ads like the one above, but also among technology journalists and screenwriters themselves. Whether in acquiescence or response to marketing that highlighted automation through language ("automatically," "instantly," "as you write," etc.) or anthropomorphized depictions of software that present the technology as an always-present "writing partner," users seized on *automation* as a critical lens for understanding and evaluating these tools.[3] Consider that reviews from this time follow a pattern: the best features of a given software are those which have most successfully (read: efficiently, intuitively) automated a task that was previously not automated; by contrast, the worst or most lacking features are those that do *not* provide time- and labor-saving automated solutions for other tasks, which remain manual. It is partly through its use as an evaluative metric that automation in screenwriting software is imbued with a utilitarian rationality that makes the division of labor between computer and scribe seem self-evident: the software *should* be responsible for these tasks, and I, the writer, *should not be.* As one critic writes in a positive

[3] ScriptThing, advertisement, *Writers Guild of America, West Journal* 8, no. 9 (September 1995): 2; Katharine Stalter, "Intertainment: Audition: Dramatica, 'Virtual Writing Partner,'" *Variety*, July 11, 1994, 36.

review of Final Draft for the Apple Macintosh: with "all the bells and whistles occurring automatically and concurrently…You just write. Isn't that what it's all about?"[4]

This chapter explores how screenwriting software served as a symbol of real and imagined changes to the artistic and industrial conditions of screenwriting in the early period of Hollywood's digital age, considered here from the late 1980s into the 1990s. While mundane by contemporary standards, screenwriting software as a product category was once passionately contested in the Hollywood trade press, screenwriting journals, and public discourse. The struggle to define software's potential role in screenwriting labor recruited the input of communities then considered outside the entertainment industry proper, including software designers and programmers, who, along with their technical knowledge, brought with them to these discussions their philosophies on creativity, innovation, and the ability of technology to assist in both. Claims that a computer could make someone a better, more creative writer were the focal point of most screenwriting software advertising campaigns and were, perhaps by design, the most provocative ideas among screen- and other creative writing traditionalists. Examining such discussions in detail reveals the extent to which skeptical screenwriters, working and aspiring, understood writing and other creative tools' propensity to *shape* and *prescribe* the work such technologies claim merely to facilitate and enhance.

The objects of interest for this study include reviews, editorials, letters-to-the-editor, and advertisements found in screenwriting journals – though a good portion of the material comes from the *Writers Guild of America, West Journal* (renamed *Written By* in 1997). These sources are privileged for two reasons: first, the fact that these journals' contributors, marketers, and readers have an explicit investment in screenwriting labor, industrial trends and the future of the

[4] James Tugend, "Final Draft for The Apple Macintosh," *Writers Guild of America, West Journal* 4, no. 8 (Aug 1991): 33.

craft; second, that content in these journals, as a result of this shared investment, tends to be more varied, niche and revealing of the minute, ever-changing concerns of screenwriters in Hollywood than that in standard trade publications, which *cover* the same topics but rarely participate actively in their discussion. To provide context for the images and ideas found in these issues – and to provide a basis for symptomatic readings of them – I rely on media industries histories and production studies research interested in the working lives of screenwriters. Such work includes Mirada J. Banks' *The Writers: A History of American Screenwriters and their Guild,* as well as Bridget Conor's *Screenwriting: Creative Labour and Professional Practice,* which goes beyond the scope of this chapter in its treatment of the UK screenwriting scene but still provides useful models for understanding how screenwriting was/is constructed as a creative profession.

This chapter is organized into three sections, each corresponding to a different "inflection" of the discourse around automation in screenwriting via software. In the first section, I unravel the intra-industrial implications of a computer program that can perform aspects of the work of the screenwriter. Screenwriting software is interpreted here as intervening in the storied struggle between two classes of Hollywood worker: the creative and the manager/executive. Bypassing the question of whether a computer program *can* make screenplay writing easier, "better," and more profitable, the voices in this section skip to the more pertinent question: if it can, *for whom will it do this?* Answering this question means indirectly speculating about impending changes to the political economic order as Hollywood, through its embrace of digital technologies, becomes more "modern." It also means reconsidering the premise of such software – are these products really *for* the creatives, or are they actually new tools for management? Are they both?

If the first section reports on the ongoing struggle between Hollywood's creative and managerial as seen in discourse around screenwriting software, the second section follows screenwriters back to their metaphorical base camp within the journal pages, where philosophical analyses of creativity and the *purpose* of the screenwriter artistically and industrially speak to an acute, technology-fueled identity crisis. While anxieties about the automation of creative work and its relation to deskilling, the rejection of tradition, and waning interest in script "originality" converge around screenwriting software, this section demonstrates the software's tendency to stand in for a *wide range of* digital technologies infiltrating Hollywood that promise, with dubious entitlement, to seamlessly merge new modes of technology-enabled work with the well-worn traditions of creative labor. As one commentator says in a 1998 *Chicago Tribune* write-up on the emerging software market: "Screenwriting software, when it works, can show off a computer at its best."[5] Screenwriting software, in this section, prompts reflection on shared beliefs about writing and who should take the lead in supporting, preserving, and reimagining its practice.

Finally, the third section grapples with the politics of screenwriting software and some consequences of its eventual adoption and naturalization. If a creative tool necessarily shapes and prescribes a way of doing work, it also endorses an array of implicit beliefs about the work, always at the expense of opposing belief systems. This section underscores that while the so-called existential threats of automation in screenwriting may be *described* as a craft-wide concern, as in the conversations above, the actual destabilizing effects are not felt equally across industrial communities. This section speaks to the connection between the symbolic, self-reflexive power of screenwriting software and the material conditions of production. It asks,

[5] Jimmy Guterman, "Screenwriting Software, Computer Metaphors," *Chicago Tribune*, May 12, 1998.

simply, how and in what way did the discourse around screenwriting software change practices in and around Hollywood? One answer offered: screenwriting software's automated formatting features and the reactionary discussions about their value contributed to the obsolescence of an entire sub-industry of LA-based printing professional services. Led almost exclusively by women, these local shops, like the famous Barbara's Place on Santa Monica Boulevard, provided screenwriters personal access to formatting expertise and professional-quality manuscript printing services. Beyond simply offering a new way to engage formatting standards and knowledge, screenwriting software creators relied on a marketing rhetoric intentionally and explicitly dismissive of formatting expertise. Software reviews by screenwriters and technology journalists echo these sentiments and describe the practice of screenplay formatting as inconvenient, overly complex, and most importantly, as ancillary to the true creative work: writing dialogue, developing characters, and designing story structures. This section explores how such claims leverage entrenched, gendered assumptions about formatting and related "women's work" (clerking, typist professions) to redefine formatting knowledge out of the purview of screenwriting as an artistic practice.

Ultimately, this chapter seeks to demonstrate not only that creative tools have politics, but that tools and other creativity aids are worthy of consideration alongside studies of bona fide industry work for insight into Hollywood's labor conditions and cultures.[6] It would be shortsighted to assume that creative tools emerge only to support existing creative practices and not to suggest new ones according to inscribed ideologies, as well as those that emerge through their use. Indeed, questions about screenwriting software's underlying belief systems are often at the forefront of these dialogues. Software developers, as we will see, are eager to defend their

[6] Langdon Winner, "Do Artifacts Have Politics?," *Daedalus* 109, no. 1 (1980): 121–36.

products from this exact kind of critique by distancing their software from other screenwriting tools that, in their eyes, are more overtly *cultural,* such as screenwriting how-to resources, proprietary story design paradigms, and guru-driven seminar circuits – this despite similar goals, intended audiences, and applications. These non-computational screenwriting tools, by virtue of their basis in interpretation and intuition, are more easily positioned by commentators as unreliable and idealistic; screenwriting software, by contrast, is often made to seem superior through its association with computers, and thus with the world of science and logic.

Scholars in media, technology, and information studies are pushing back against the tendency of digital technologies to obscure their ideological origins and biases, historical continuities, and societal obligations – screenwriting software should be treated with the same critical scrutiny. Methodologically, this chapter draws from Melissa Gregg's research into the impact of digital technologies on knowledge economy working lives, as well as the market logics that creep into the home through our devices. In *Counterproductive: Time Management in the Knowledge Economy*, Gregg explores how "productivity" as a management ideology and enduring component of professional subjectivity has been variously translated into time management advice, self-management principles, and various productivity-enhancing technologies, including mobile and desktop applications.[7] Part of Gregg's argument, which shares my interest in the process by which visions of ideal work become muddled with corporate self-interest, involves exposing contrivance and irrationality and systems otherwise associated with reason or even common sense.

Before going any further, however, it will be useful to give a brief history of screenwriting software beginning in the mid-1980s. This history fills in basic details that will be

[7] Melissa Gregg, *Counterproductive: Time Management in the Knowledge Economy* (Durham: Duke University Press, 2018), 216.

relevant for later analysis, including: the original premises of screenwriting software, the variety of software types and their popularity, and the qualities of the technology deemed most useful by users and developers in this early period. Though hardly comprehensive, by taking a broad, "Five W's" approach, this history gestures toward other interesting stories, characters, and thematic threads worthy of their own treatments but beyond this chapter's scope.

Fade In: The Early History of Screenwriting Software

There are conflicting reports about who created the very first screenwriting software, both for lack of definitive documentation and technical reasons. In the case of the latter, most information available today is self-reported by the developers, and there are many small teams of developers that can easily claim to have "begun" work on screenwriting software or similar ideas in the early 1980s even if they did not release a complete product until years later.

As for the technical reasons: establishing a date for the origin of screenwriting software means distinguishing between software *used* by screenwriters to produce scripts and *screenwriting software* as it is understood today. Observing from the present, this distinction is not immediately clear, especially considering scripts in the 1980s were often produced using either a combination of word processor and script formatting software, or even community-spread word processor presets that helped achieve desired formatting or printing goals. Even in 1990, the *Writers Guild of America, West Journal* writer James Tugend noticed the ambiguity characteristic of the early screenwriting software marketplace: "There is considerable confusion as to the difference between *Movie Master* and, say, *Microsoft Word*, which is the most popular word processor in our industry. I love *Microsoft Word*. I use it every day to write treatments,

letters, articles, etc. But there are certain aspects of the screenplay format that make *Movie Master* not only easier to learn and use, but also much faster. And time is money."[8]

By the time of Tugend's writing, software dedicated to producing film and/or television scripts was at least 7 years old. Around 1982-1983, the programs ScriptThing (ScriptPerfection Enterprises) and Scriptor (Screenplay Systems, later Write Brothers) released and claimed to "invent a whole new category of software."[9] These programs, along with the many others like them to emerge thereafter, were sold at computer stores for anywhere between $99-$300 not including the cost of the computer hardware (at this time and into the 1980s, varying from around $1500-$5000).[10] Before programs like ScriptThing and Scriptor, writers using computers to produce scripts favored software word processors like WordStar (1979, CP/M), then WordPerfect (1982, MS-DOS), then Microsoft Word (1983). The most common practice involved the use of multiple programs corresponding to different stages of the writing process. For drafting, screenwriters, like an increasing number of professionals at this time, would begin by producing text in word processors. Community-shared pre-sets allowed writers to modify these word processors to achieve studio-like script formatting through creative manipulations of page breaks, margins and more. Scriptor was one such program designed as a second-step tool to complement and enhance the capabilities of WordPerfect or Microsoft Word. The program allowed the writer to use 'tags' in their word processor document that would later perform commands once imported to Scriptor.

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[8] James Tugend, "The Best Screenwriting Software," *Writers Guild of America, West* 3, no. 10 (October 1990): 21.

[9] "Who Are the Write Brothers? Extended History," Screenplay.com, accessed August 13, 2021, https://screenplay.com/pages/history-1.

[10] Benj Edwards, "The Golden Age of IBM PCs," *PCMag*, Aug 11, 2021, https://www.pcmag.com/news/the-golden-age-of-ibm-pcs.

As early as the late 1980s, a multi-stage process was formalized in the ABC studios script department, which used Warren Script Applications (WSA) to import and format text originally produced in a word processor.[11] The legacy of the multi-stage process, which involved the combination of a word processor and screenwriting software program, continued to influence screenwriting program development into the mid-1990s. Programs that focused exclusively on processing text into script formatting comprised the biggest category of screenplay software during this early era, since even with shared presets and other creative workarounds, word processors failed to provide one-stop-shop solutions for formatting elements like page breaks, character names, dialogue, etc. While many screenwriting programs also could not achieve the one-stop-shop ideal, whether by design or merely inadequacy, some were still able to differentiate themselves in the market as being more adept at certain *kinds* of script formatting. In the 1990s, Movie Master was celebrated for adding features that addressed the specialized needs of stage play, daily soap opera, sitcom, and news program writers.[12] In this way, software served to recognize and concretize the development of various specialties of writer within the Writers Guild journal, allowing the membership and developers to sketch the boundaries of the craft and consider its changing values and needs.

Though purpose-built for helping screenwriters, these programs still required a degree of technical literacy. Elaine Spooner, in her 1996 comprehensive overview of the product category, makes a point of noting how each of the programs reviewed "interface to other tools" and support multiple file formats (particularly ASCII), indicating how such knowledge was a critical

[11] James Tugend, "Software That Delivers Scene After Scene: Latest Software for Screenwriting, Sitcoms, and Daytime Soaps," *Writers Guild of America, West Journal* (June 1989): 40, 55.

[12] Tugend, "The Best Screenwriting Software," 21.

factor in determining which program a writer would want to invest in.[13] Moreover, some programs required extra steps to have a script printed correctly, all at once, with all formatting preserved. In his 1990 review of Screenplay System's *Movie Master* for the WGA-W journal, Tugend complains that memory constraints prevent the program from storing or printing full-length scripts in a single file, instead insisting on splitting the document into two separate files. This limitation increases the amount of time a writer must wait for the program's spell-checker and pagination process to run prior to printing.[14] (For context; in other reviews, Tugend explains it can take 40 minutes to paginate a full-length screenplay using rival program Warren Script Applications.)

By the mid 1990s, screenwriting software was coming into its own, not simply as a diverse, competitive product category, but also as a valuable innovation in the entertainment industry. In 1995, The Academy of Motion Picture Arts and Sciences awarded its Technical Achievement Award to Chris Huntley and Stephen Greenfield for their development of Scriptor, which remains the only award given to screenwriting software developers. Media coverage of screenwriting software sought to simplify and disentangle the various options available to writers; Elaine Spooner's "Ultimate Screenwriting Software Review" in 1996 breaks the market down into three categories: Script formatting tools, like those described above that help shape text for reading and printing (the biggest category, including Scriptor, ScriptThing, Movie Master, Final Draft); Script analysis tools, which market themselves as writing aids that can analyze story, structure, and characterization (the smallest category, including Dramatica, Collaborator, Plots Unlimited); and script outlining tools, which provide various visualization

[13] Elaine Spooner, "The Ultimate Screenwriting Software Review," *Writers Guild of America, West Journal* 9, no. 7 (July 1996): 30.

[14] Tugend, "The Best Screenwriting Software," 21.

tools for planning and arranging a script's structure, plot beats, and other story elements (Three by Five, StoryVision, Writer's Blocks).[15]

As the programs changed, so too did the market for these products. Beyond Hollywood, the rise of personal computing alone in the 1990s increased the consumer base for software tools. Within media industry, as Tugend writes in 1994, "The market for software to write scripts in the screen and dramatic television formats is somewhat limited by the fact that there are only around 10,000 Writers Guild members, plus the thousands of other writers who hope to be Guild members someday. On the other hand," he continues, "practically every town in the civilized world makes local commercials, television productions and information films and videos, creating a potentially huge market."[16] However, the obviousness of the target consumer — i.e., those currently employed to write scripts for entertainment and other media production -- should not overshadow another formidable market segment: the growing ranks of aspiring writers attracted to the craft by high-profile spec script sales and the booming independent film scene. In a 2013 *Vanity Fair* piece, Margaret Heidenry refers to the 1990s (with a peak in 1995) "when the spec script was king."[17] Writer-director John Hamburg tells Heidenry that "in 1996, the spec market was this mythical thing…Everybody had a shot as becoming a millionaire overnight."[18] Hamburg's reference to dreams of sudden and enormous wealth matches industrial accounts which characterize the rise of spec script writing as an ambivalent development for the Writers Guild leadership; while studios' enthusiasm for spec scripts opened possibilities for a few

[15] Spooner, "The Ultimate Screenwriting Software Review," 24–25.

[16] James Tugend, "Side by Side: Multi-Column Formatting Software," *Writers Guild of America, West Journal* 7, no. 5 (May 1994): 37.

[17] Margaret Heidenry, "When the Spec Script was King," *Vanity Fair*, February 8, 2013.

[18] Heidenry, "When the Spec Script was King."

fortunate creators, this gain came at the cost of critical labor safeguards for the majority of writers, who would effectively "gamble away months" working independently on a script, without pay, for a script that might never profit the writer.[19] Screenwriting software facilitated this labor climate by offering a way for beginners to develop self-sufficiency and more easily produce professional-looking scripts from their own home, regardless of their proximity to the industry or its printing services.

Ultimately, both the spec script and independent film markets in the 1990s were similarly bolstered by optimism about digital technologies' ability to lower the barriers of entry to media production, although screenwriting software is often overlooked as a key enabler of this creative movement in favor of digital video, audio, and editing equipment. Perhaps this has to do with the common understanding of writing as a low- or even no-tech activity compared to audio and video tasks. Or it is likely that trade coverage of screenwriting software often came from sympathetic parties; in some cases, the software is spared the kind of anti-technology skepticism reserved for innovations like digital effects which are viewed as taking over Hollywood production for the worse. In a 1998 editorial for the *Chicago Tribune,* Jimmy Guterman laments the over-use of digital special effects in James Cameron's blockbuster *Titanic* (1997) to gloss over lazy storytelling. Rather than focusing on impressive visual effects using innovative digital technology, Guterman says, "maybe Cameron should have tried using screenwriting software…when it works, [screenwriting software] can show off a computer at its best."[20]

One of the early figureheads of the screenwriting software industry in the 1980s-1990s was Stephen Greenfield, a former USC film school alum-cum-programmer who, along with Chris

[19] Miranda J. Banks, *The Writers: A History of American Screenwriters and Their Guild* (New Brunswick, New Jersey: Rutgers University Press, 2015), 7.

[20] Guterman, "Screenwriting Software, Computer Metaphors."

Huntley, founded Screenplay Systems in Burbank. This company employed roughly 30 employees and quickly established itself as a mainstay of the market with Scriptor (a screenplay formatter) and production-focused software like Movie Master Budgeting and Scheduling/Breakdown. In a 1995 overview of the "3-million-a-year-and-growing screenwriting software industry," Greenfield is seen posing for a photo next to a computer, which the author says can now function as a "[writing] coach-in-a-computer."[21] Screenplay Systems is reported as having taken control of "nearly half the market," yet still catches some disdain from the author for the absurdity of the product category; For his part, Greenfield combats this sentiment (i.e., who *needs* a computer as a writing coach?) with his bold predictions about the future of screenwriting software.

Greenfield's plans shed light on differences in understandings of the early market for screenwriting software. The article serves as one of the many public outreach efforts to challenge software skeptics. For Screenplay Systems, this initiative supports its business goals in targeting up-and-coming screenwriters still in film school to convert and learn the craft through their technology. Their attachments to the programs, Greenfield reasons, will then carry over into the professional setting and infiltrate studio-level workflows more thoroughly than a top-down takeover. "Greenfield has gone head-to-head with leading film instructors," writes Joseph Hanna, "debating them on story form and content. Discussions have centered on how his program [Dramatica] can help them focus on core issues such as the contrast between order and chaos."[22]

[21] Joseph Hanania, "Scripting Software: How-to Screenplay Programs Act as Coach-in-a-Computer," *Los Angeles Times*, June 30, 1995.

[22] Hanania, "Scripting Software."

Whose Software? Whose Power?

This section charts the emergence of screenwriting software within a matrix of power relations in Hollywood. Not all who use screenwriting software deal with producers and executives. Even so, these programs embody and reify aspects of these professional relationships, as they were interpreted and negotiated at the time. Even as industrial roles blurred and overlapped in the wave of conglomeration, the entertainment industry remained, writes Caldwell, "characterized by an extreme stratification and division of labor," operated in a "pyramidal top-down management structure."[23] This stratification and rigid managerial apparatus underlie the "group-based contestation that inherently defines the production enterprise" and runs counter to aspirational representations in media and within media companies themselves that media production is "collaborative, personal, and humane."[24]

How did screenwriting software, with all its imagined potentials, factor into this system? The idea that software could make screenplay writing easier, better, and more profitable had obvious (though complicated) allure for writers, but the technology was also understood to serve the interests of management by streamlining and automating the writing process. Suspicions about the true benefactors of technology-enabled screenwriting underscore screenwriting software's contribution to constructions of this era's management logics, its interpersonal power struggles, as well as binary distinctions between creative and commercial impulses underlying notions of "creative control."

Superficially, early screenwriting software seemed poised to empower the self-sufficient, even independent, screenwriter. It is presented and understood as offering a semblance of

[23] John Thornton Caldwell, *Production Culture: Industrial Reflexivity and Critical Practice in Film and Television*, Console-Ing Passions (Durham, N.C: Duke University Press, 2008), 96.

[24] Caldwell, *Production Culture,* 96.

professionalization to the socially, possibly geographically removed, scribe. But in other instances, it is firmly aligned with the economic and cultural power of studios and other Hollywood establishment figures. In this configuration, the technology takes on a hegemonic function by validating and supporting the developing labor conditions, which, as described above, placed an increasing burden on writers to navigate the competitive, precarious labor market as individuals.

In 1995, for example, Script Wizard (Stefani Warren and Associates) declares itself to be, "Everything you need to meet the demands of your craft, your imagination, and your Producer!"[25] The interests of the producer, apparently obvious enough to require no definition, are posited as the concerns of the writer, exemplifying the prototypical neoliberal subjectivity in which the individual adopts the concerns of industry as one's own. In a subheading of the ad that reads, "Coming Soon: The Production Report Pak [sic]," we get insight into specific features the Script Wizard designers believed would help "meet the demands" placed on the writer by higher-ups: "automatically generated production reports including title pages, scene reports, cast lists, rundowns, taping schedules, production breakdowns, and set and cast utilization reports." These production-oriented features which extend beyond the screenwriters' responsibilities are in fact the only ones listed in the ad, highlighting a broader audience of production personnel invested in screenwriting software.[26] The ad's brief allusion to the producer inscribes the relationship between writer and producer as one of obligation and supplication, as opposed to productive creative collaboration — a dynamic which Script Wizard, along with other such programs, seeks to mediate and reinforce.

[25] Script Wizard, advertisement, *Writers Guild of America, West Journal* 8, no. 9 (September 1995): 49.

[26] Script Wizard, advertisement, 49.

Figure 1: An ad for ScriptThing links a representation of its interface to concepts of professionalism. ScriptThing, advertisement, Written By 1, no. 7 (July 1997): 57.

By embedding production-oriented features, including organizational and visualization tools, into their programs, software companies reinscribed the prominence of financial and commercial interests in structuring the digital screenwriting experience. The push to advance and market these features foreshadowed the role of screenwriting software in helping studios create an increasingly tracked, measured, synced, and automated production process in the ensuing decades. Screenwriting software companies understood early on the importance of aligning

themselves with Hollywood's emerging white-collar sensibility. An ad for ScriptThing in 1997 (see Figure 1) dubs the program "The Professional's Choice," but features endorsements from non-writers, muddying the specificity of the term. "[ScriptThing is] the best program for scriptwriting. Period…it worked flawlessly in an impossible production environment," says one television script coordinator.[27] The largest quote, visually dominant in the ad, reads: "Every feature script at DreamWorks goes through my hands, and every one goes through ScriptThing." This comes from Christopher Gauntt, project coordinator for the Feature Story Department at DreamWorks. The quote is arranged as if it were typed into an open project document within the ScriptThing interface. The blank page, often figured as the domain of creative invention and the writer's hallowed proving ground, is stamped with a DreamWorks SKG watermark.

It is clear that marketers believed (with justification) part of the appeal of these programs was tied to their commercial orientation and link to managerial power. This and similar marketing makes aspirational the idea of being, more or less, in a studio's pocket.[28] In what one can only hope is a tongue-in-cheek 1990 ad (see Figure 2), the screenwriting software Scriptor (Screenplay Systems) inserts itself into Hollywood's cultural and industrial milieu as a powerful status symbol signifying acceptance by Hollywood's elite.

[27] ScriptThing, advertisement, *Written By* 1, no. 7 (July 1997): 57.

[28] Presumably, for the "wanna-be" outsiders who are frequently imagined as a main audience for these products, this aspirational quality would be even more potent – even if managerial forces are imagined.

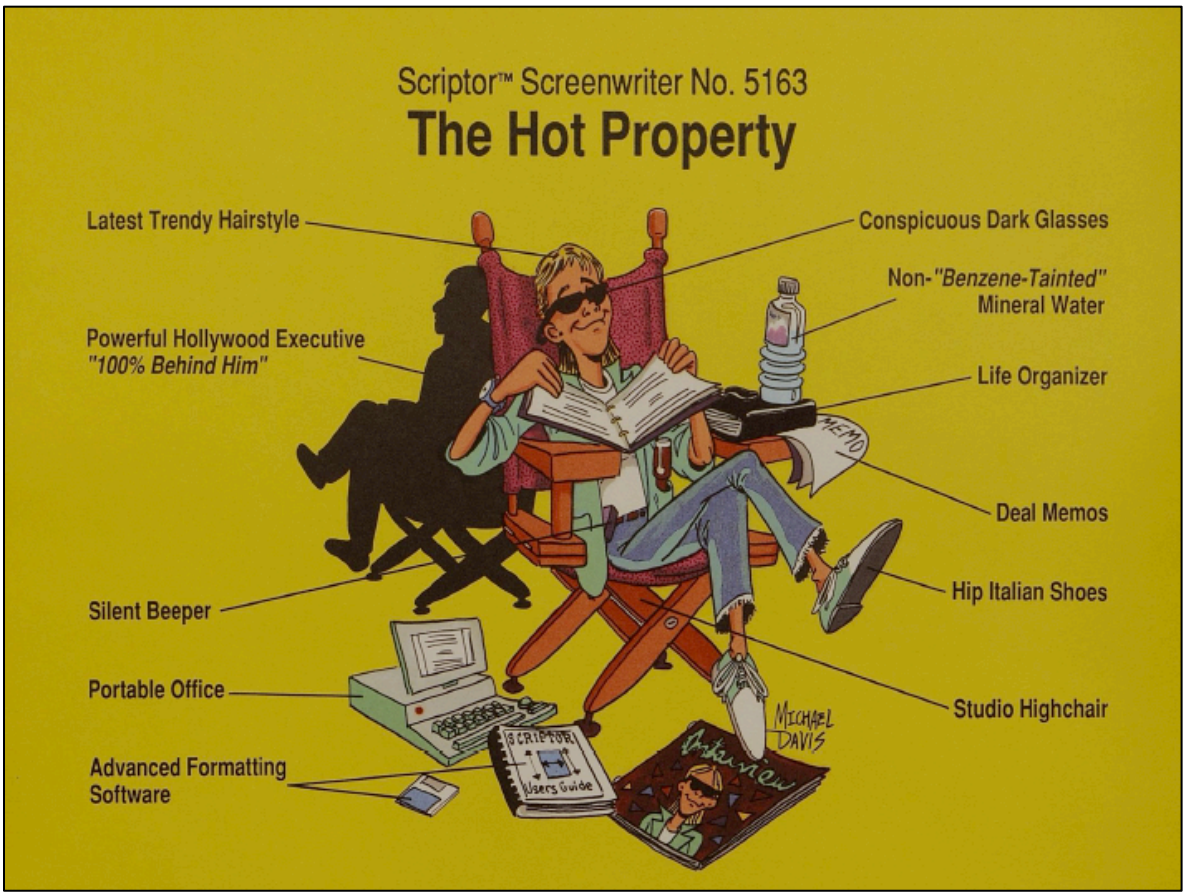

Figure 2: Screenplay software presented as a trendy, status-focused consumer product that invites a specific brand of success. Scriptor, advertisement, *Writers Guild of America, West Journal* 3, no. 4 (April 1990): 2.

The ad depicts a smug, white male screenwriter sitting on a director's chair amidst a collage of "trendy" consumer goods, including "non-'benzene-tainted' mineral water," a "life organizer," and a "silent beeper," among other up-to-date fashion signifiers like the "latest trendy hairstyle" (blonde mullet). Almost an afterthought visually, on the floor beside the chair, rests a "portable office" computer, a Scriptor user's guide, and a floppy disk labeled "Advanced Formatting Software." The description of the "Hot Property" screenwriter has a macho, Sportscenter flavor: "He's hot. He's got momentum. His dance card is filled. He's got two scripts in production and five development deals. Every agent in town wants to steal him."[29] Behind the

[29] Scriptor, advertisement, *Writers Guild of America, West Journal* 3, no. 4 (April 1990): 2.

screenwriter, we see a shadow labeled "Powerful Hollywood Executive '100% Behind Him,'" an arrangement that enforces an understanding of the screenwriter as a superficial agent of behind-the-scenes machinations by more authoritative entities (in this case male-coded, despite abstraction). Screenwriting software allows this "property" to be "hot" — itself an aspirational spin on the notion of being traded like a commodity according to the desires of Hollywood suits. Whether accurate or not, the ad theorizes one way screenwriting software would engage a historically specific form of professional subjectivity. Despite the software's appearance as a glamorous novelty signifying success, these qualities are offered as a product of self-fashioning and refined tastes. Ultimately, as the producer's silhouette subtly emphasizes, these tools represent compliance and conformity to the managerial and executive powers-that-be.

Another way screenwriting software was imagined to mediate the relationship between writers as creatives and the managerial class had to do with its premise: the indiscriminate disbursement of craft knowledge, for one, as well as the codification of story. Both points were identified as concerns among screenwriters in reference to software, who worried the technology could water down the craft in mainstream consciousness and diminish the screenwriter's creative authority in the eyes of executives. An example of this comes when David Prescott, a writer-software developer hybrid, defends the value of software as a learning tool for self-starters in the WGAW journal in 1991: "It's amusing to see articles suggesting that screenwriting can't be taught (or do they mean shouldn't be taught) amid ads for computer software that will aid not just with formatting but with developing plot lines. One thing is for certain. If it can be programmed, it can be taught."[30] Prescott alludes to the influence of these programs as representatives of screenwriting to an audience of "wannabes," and implies their agency in

[30] David Prescott, "A View From Without," *Writers Guild of America, West Journal* 4, no. 3 (March 1991): 5.

propagating ways of performing a writer's work. This statement also configures software as a material embodiment of craft knowledge, thus lending increased stakes to its authorship. Prescott is in fact responding to those who share this belief about the technology, but instead frame it as a threat: if not all software naysayers think the craft "shouldn't be taught," many believe they should determine what gets taught, and to which audiences.

After all, screenwriters had already learned the hard way they would be held accountable to representations of their work made widely available via the growing market of resources for writers. Such concerns about screenwriting software were in fact re-articulations of complaints levied against the original "story guru" movement in the 1980s. As figures like Robert McKee, Syd Field, Linda Seger, and John Truby popularized story theory to a mass audience (including Hollywood personnel), writers reported antagonistic meetings with creatively emboldened executives who weaponized terms like "plot points" and "inciting incident." One revealing anecdote from an extensive 1995 profile of story guru figures describes how this dynamic played out: "One well-known screenwriter accosted [Syd] Field at a party, "You son of a bitch, how could you do this to me? In my contracts now from the studio they tell me now [sic] I have to write a three-act screenplay."[31] Screenwriting knowledge, and the resources that package and distribute it, become imbricated in power struggles between creatives and executives. In another example, Jim Weda, a former executive and producer at Hollywood Pictures, reveals how story seminars were indeed understood as bolstering professional status. He says, "The worst thing about these screenwriting classes is that all these D-girls, studio executives, readers, etc. — who have no idea how to tell a story and are just in the business side of show business — take these

[31] Todd Coleman, "The Story Structure Gurus," *Writers Guild of America, West Journal* 8, no. 6 (June 1995): 20.

classes and think they know what they're doing, and tell people how to rewrite the script, based upon the list of things they get from these classes. That's the evil part of these classes."[32]

While critiques of screenwriting software in the 1990s can be linked to previous critiques of self-help, story theory, and the screenwriting gurus themselves, they offer different, equally historically situated interpretations of the way Hollywood establishment gains, maintains, and exercises its power — in this case, through technologies. If screenwriting software seemed to escalate previous concerns about the integrity of craft knowledge and the consequences of uncontrolled representations of screenwriting via its tools, it is because of widely shared beliefs about digital technology, information, and the pending digital revolution. The imagined ability of computers (and by extension, software) to democratize information and render it instantly available to the masses was central to the digital utopian fervor of the emerging Web 1.0.[33] In his role as public intellectual and head of the MIT Media Lab, Nicholas Negroponte was drumming up support specifically for computers and the Internet as tools of education, through which the next generation could learn to perform a variety of jobs and skills — enthusiasm that would culminate in his One Laptop Per Child initiative in 2005. Within Hollywood, software was already being used to work toward a totalizing, automated production environment. Most screenwriting software companies were concurrently developing programs for scheduling, storyboarding, and budgeting. Additionally, among postproduction workers, whose work relied

[32] This dynamic – screenwriters seeking to take control of screenwriting knowledge and resources to solidify their creative control – represents a reversal of tradition described originally in 1950 – see Hortense Powdermaker, *Hollywood, the Dream Factory: An Anthropologist Looks at the Movie-Makers,* 2013 reprint (Mansfield Centre, CT: Martino Fine Books, 2013), 183 -- in which *producers* sought to manage craft knowledge in their favor: "It may be that producers do not encourage writers to learn about the various parts of movie making, because of gear that increased knowledge and competence would reduce their power and status."

[33] Fred Turner, *From Counterculture to Cyberculture: Stewart Brand, the Whole Earth Network, and the Rise of Digital Utopianism* (Chicago, IL: University of Chicago Press, 2008).

on expensive equipment inaccessible outside a production context, innovations in hardware and software were seen as contributing to the downsizing of effects teams and the influx of cheap labor, rendering the contract marketplace even more competitive and precarious.[34]

Screenwriters' Identity Crisis

It isn't that screenwriters don't have a sense of humor about their work. Popular culture is rife with depictions of screenwriters who are self-deprecating, irreverent, or cynical about their status and artistic ambitions – especially for those who have achieved financial success and have dealt with the absurd realities of writing within an industrial system. Even accepting this self-awareness, screenwriters as a collective are deceptively invested in preserving the integrity of their craft, both materially and symbolically.

In her thorough, interview-laden history of the Writer's Guild, Miranda Banks makes a point of distinguishing screenwriters from other professional groups in Hollywood in two critical areas: their willingness to push for better working conditions, and their idealism. Both aspects of this identity manifest in discussions about screenwriting's automation via software. In the case of the former, Banks observes that "writers have initiated action in pursuit of collective rights more frequently than any other professional group," including strikes spanning five decades (1959-1960, 1973, 1981, 2007-2011).[35] For the latter, she explains the significance behind screenwriters' choice to form a "guild" rather than a labor "union." Whereas labor unions place *primary* focus on improving working conditions, bargaining for new contracts, and organizing strikes, a guild "implies a focus less on working conditions and more on championing the artistry

[34] Caldwell, *Production Culture*, 157.

[35] Banks, *The Writers*, 2, 11.

of the profession."[36] Although functionally, both branches of the WGAW have operated as labor unions, and while this slippage has been a point of confusion for some screenwriters who balk at the resentment of the union label, the term "guild" institutionally concretizes screenwriters' sensitivity to opportunities for self-definition.

Screenwriters' insistence on self-definition extends beyond negotiating better working conditions and establishing institutional goals and titles – it also includes an array of discursive, symbolic efforts to inform perceptions of the writer's plight. John Caldwell's "cultivation rituals" seek to emphasize consensus within an industrial group, even when such consensus is aspirational. These rituals gain legitimacy through performances (by professionals *for* other professionals) that blur the distinction between public and private business speak, always within similarly blurred public and private space. The types of performances Caldwell considers cultivation rituals include mentoring events (a form of pseudo-apprenticeship), advice panels, and keynote addresses, and the "halfway spaces" in which they gain their discursive power include film festivals, industry conventions, university events, and even "guild halls."[37]

I argue that the guild *journal* occupies a similar semi-public/semi-private status as do the buildings themselves. The journal privileges the voices and presumes an audience of fellow guild members, but, as with any major publication, it can be accessed by those interested enough in tracking it down. Additionally, contributors and readers overlap between the guild journals and other trade publications. For Caldwell, the liminality of these spaces informs everything said within them, unlike disclosures made within genuinely private studio offices: "Even a cursory glance at the material and physical barriers erected around the entertainment industry in Los

[36] Banks, *The Writers,* 9.

[37] Caldwell, *Production Culture*, 97.

Angeles…makes it imminently clear the extent to which business interactions are highly proprietary and sequestered away from those "on the outside" by design. In contrast, cultivation rituals and mentoring activities in these contact zones often pretend to bring out into the light of day the heretofore hidden secrets of the bunkered practitioner."[38] Keeping Caldwell's characterization in mind, even when the performative, "pretend" revelations made in these halfway spaces divulge verifiable facts about production, they should be read more for the insight they provide into the author's experiences, beliefs, and rhetorical objectives.

This section looks at "cultivation rituals" taking place in relation to screenwriting software; how do members of the screenwriting community use screenwriting software as another opportunity for self-definition – as a means of creating consensus around specific ideals of practice, craft identity, and technology use? As we will see, the voices in the examples below *cultivate* most often through negation. Think, "what not to do," only more extensive – what not to *be,* to *think,* to *buy.* They suggest (not always indirectly) the edges of acceptability within screenwriting practice. They differentiate various classes within the screenwriting community and demonstrate preferences for hierarchies. They elaborate on the ideal status of computer programming and other forms of knowledge in the screenwriter's toolkit.

What is unique about this case study is that these cultivation rituals are not performed exclusively within a community by its established members, but also by those *seeking to ingratiate themselves*: the emerging Hollywood tech crowd. Editorials by these mostly Burbank-based software and hardware developers, as well as advertisements for their products, adopt the same internal policing posture, though with more positive appeals considering their goal of creating consensus around *their products*. Yet these appeals cannot be entirely written off as

[38] Caldwell, 97.

profit-driven self-interest intervening from outside a target market. Some originate from figures with legitimate claims to both parties. The emergence of the writer-developer, or developer-writer depending on career trajectory, complicates any attributions of agency or intention to these cultivation rituals and draws attention to the ways the tech crowd and screenwriting community *engaged each other* and collaboratively shaped the relationship between writing and technology in Hollywood.

By exploring this early moment in screenwriting software development and discourse, this section offers the story of screenwriting software as a parable for the way Silicon Valley and Hollywood would compete and converge to shape the future of creative work in the later 1990s and onward. This account shows the extent to which tech-world "outsiders" felt empowered as early as the late 1980s to engage rank-and-file screenwriting guild members in debates about the nature of screenwriting as an industrial practice, as a craft, and even as an art. A key theme emerging from this examination is anxiety among Hollywood screenwriters over the automation of creativity and its consequences for the integrity and strength of creative labor. Although it is based in shrewd understandings of industrial logics (as we saw in the first section), this anxiety is nevertheless represented most often by sensational claims that computers, beyond assisting screenwriters, might eventually create ideas or even produce scripts for movies and television on their own.

Even before computers, technology has played a significant role in screenwriting. Typewriters, word processors, and even pens required technical innovations and adjustments to common practices as part of their incorporation. At the level of the studio, the need to circulate numerous versions of scripts across multiple departments requires the use of mimeographs (until

around the 1960s), lithographic duplicates (into the mid 1980s), and photocopiers (1980s-).[39] Moreover, simple brass brads, able to bind scripts in a particular order then be removed to insert, remove or re-arrange pages later, are often overlooked as analog means of achieving the kind of modularity and non-linearity in script production that software developers claim as their invention.[40]

Additionally, screen- and other writers have historically mythologized their tools, not simply as cultural signifiers but also as objects whose properties promote specific modes of writing. Many of the most popular self-help advice books for writers will invariably take a position on technology use when suggesting tools, often encouraging writers to step away from the now ubiquitous screens that inundate us with distracting emails and endless notifications. Former screenwriter Julia Cameron's blockbuster *The Artist's Way* series specifically requires daily writing without the use of digital technologies; instead, Cameron insists on using paper and pen, citing the psychological and spiritual benefits of writing longhand as a way of reconnecting with one's creative self.[41] Implicit in this advice is the belief that computers and writing software represent a categorically different (and inferior) level of mediation between writer, ideas, and words than does paper and pen.

In another example, consider the mythology behind the enduring enthusiasm for index cards, corkboards, and thumb tacks. Perhaps Hollywood's most famous writing "technology," this system for organizing and re-arranging story information is credited as enabling more

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[39] Kevin Johnson and Erin Shreiner, "The Screenplay as Material Text," (paper presented at The Bibliographical Society of America, October 2, 2020), https://www.youtube.com/watch?v=qQ5t0BPb1Mo.

[40] According to Johnson and Shreiner, the mutability of screenplays as a result of brads is so comprehensive that archivists cite it as a central issue in attributing authorship and origin in some cases. See Johnson and Shreiner, "The Screenplay as Material Text," (October 2, 2020).

[41] Julia Cameron, *The Artist's Way: A Spiritual Path to Higher Creativity* (Los Angeles, CA: Jeremy P. Tarcher, 1992).

spontaneous, purposeful, and creative thought than other systems due to its flexibility, its ability to break down complex ideas into smaller bits, and its materiality. The preference for using index cards is so entrenched that even early on, screenwriting software developers sought to replicate the experience on the computer, most often as a feature, but occasionally as dedicated programs like Corkboard, Three By Five, and Writer's Blocks.[42] Some ascribe the power of index cards to the way they allow the writing process to conform to thought patterns most conducive to storytelling, though programs like Apple's HyperCard suggest the appeal of index cards for managing workflows beyond screenwriting. In a pleasantly philosophical overview of innovations in screenwriting software for the *Chicago Tribune,* Jimmy Guterman insists even with the sophistication of such programs, "there remains no better organizing tool for structuring any big screenwriting project than a package of 5-by-7 index cards and several pencils with erasers. The enforced linearity of the conventional screenplay is antithetical to the openended [sic] computer structure."[43] Others trace the power of index cards to their materiality. In a review of story guru Blake Snyder's index-card-based methodology on his personal blog, Phillip Allen writes, "After reading *Save the Cat!* I would *not* recommend that you *only* use the index card scripting method on some sort of software (i.e. an App)…This is because giving your mind an opportunity to actually deal with a problem in different ways (i.e. with your hands, index cards, tags, rubber bands, string, pens, etc.) gives you a different perspective on a problem."[44] However writers characterize the benefits of the index card method, their advice and testimonials demonstrate the propensity for screenwriters to see tools as facilitating beliefs about the nature of

[42] Tugend, "Side by Side: Multi-Column Formatting Software," 37; Jeffrey Sullivan, "Story Development Software Creative Aids or Mechanized Creation?," *Writers Guild of America, West Journal* (December 1995): 24-28.

[43] Guterman, "Screenwriting Software, Computer Metaphors," May 12, 1998.

[44] Phillip Allen, "The Index Card Scripting Method: The Board," *Unknown Comics* (blog), May 30, 2018, https://unknown-comics.com/the-index-card-scripting-method-the-board/.

writing. Not only do a writer's chosen tools tell us something about their personality, but they also imply processes with philosophies.

Therefore, while screenwriters' discussions about screenwriting software often contain wide-eyed speculation about the revolutionary potential of computers, it is important to acknowledge these tools as sharing continuities with the writing technologies – even those that are non-technological – that came before. We should not assume that the ability of screenwriting software to spark passionate interest and discussion is an unambiguous testament to the novelty or "disruptive" power of the technology. Writers are always thinking critically about their tools. We should instead ask why do *these beliefs* converge around *these tools* at *this time*?

To make an argument about screenwriting software's valence within the expansive and equally contested world of Hollywood screenwriters, I first need to describe the general state of screenwriting in the years surrounding the technology's ascension into mainstream consciousness. The primary concerns of writers in these times, while certainly related to the increasing reliance on computers in production, are more economic than they are existential — though some screenwriters might object to making a distinction in such a cutthroat business.

Screenwriting software emerged at a time when all Hollywood workers were facing the downstream effects of massive deregulation begun in the early 1980s — often cited as coinciding with the election of Ronald Raegan — and culminating, but not terminating, in the signing of the Telecommunications Act of 1996 by Bill Clinton. These two decades saw fundamental shifts in the political economy of media industries in a relentless process of "structural convergence," which Jennifer Holt describes as a combination of vertical and horizontal integration and conglomeration.[45] Deregulatory policies and uneven enforcement of anti-trust law set the stage

[45] Jennifer Holt, *Empires of Entertainment: Media Industries and the Politics of Deregulation, 1980-1996* (Rutgers University Press, 2011), 3.

for the rapid convergence of film, broadcast, cable and video industries under the umbrellas of multinational conglomerations led in part by media tycoons like Ted Turner and Rupert Murdoch. Holt astutely labels such power plays, typical in these two decades, as "empire building," given their singular focus on "amassing power and centralizing control."[46] In this increasingly corporate Hollywood culture, "economies of scale" and "synergy" became rallying concepts directing media corporations as they sought to develop global markets and merge the business interests of their parent company's varied assets.

Without a doubt, such widespread, historic changes in the economic structure of Hollywood were felt by screenwriters, and not simply because we might consider them, on the whole, a sensitive bunch. Media industry scholars have extensively explored the on-the-ground effects of these political economic shifts for Hollywood production personnel: for one, entertainment work became more precarious, especially but not exclusively for below-the-line workers. Jobs became harder to get, harder to keep, and harder to manage. John Caldwell explains how the increased practice of outsourcing of production and post-production labor inevitably led to downsizing within media companies, particularly within Hollywood's technical communities.[47] Media executives touted these changes as "right-sizing" their labor force to promote flexibility and efficiency for the unpredictable future promised, in part, by emerging media technologies. In terms of job security, media production workers started to compete for a dwindling number of jobs, many of which were beginning to resemble independent contract work. For Michael Curtin and Kevin Sanson, the industrial logic resulting from this period of media conglomeration (and further developed in the decades since) "thrives (indeed, depends)"

[46] Holt, *Empires of Entertainment,* 4.

[47] Caldwell, *Production Culture*, 154–57.

on labor practices that "[use] worker concerns over job security to raise productivity," mostly by expecting individuals to put in extra, unpaid work to ensure their competitive status in the marketplace."[48]

Returning to Banks, we see how feelings of individuation and alienation were only intensified by the conglomeration frenzy of the 1980s and 1990s. In the 70s, owing to New Hollywood auteurism, the rise of the blockbuster, and the decline of long-term studio contract work in favor of spec script writing, Banks charts a rise in the profile of the individual writer as a personality and symbol of the financial heights one can reach as a scribe. This mainstream awareness of the writer as individual was bolstered by their new industrial roles, including "hyphenate" positions like writer-director and writer-producer, especially prevalent in television production. From the perspective of the Writers Guild of America, these changes represented a fracturing of writers' experiences and shared interests, compromising the community's ability to organize for improved labor conditions.[49] Indeed, a series of three strikes by the WGA in the 1980s demonstrated the competing interests of hyphenates, whose direct role in production decision-making challenged the creative vs. management binary made in the first section, and those of rank-and-file writers. In their efforts to set the rules for the burgeoning cable and home video markets, media conglomerates and their Hollywood assets tested the flexibility and patience of screenwriters, until disputes over residuals and credits reached a boiling point. Within the Guild, heated debates about these issues exposed growing class divisions among screenwriters, whose work was becoming increasingly sporadic in terms of quality and

[48] Michael Curtin and Kevin Sanson, *Precarious Creativity: Global Media, Local Labor* (University of California Press, 2016), 2.

[49] Banks, *The Writers*, 157–59.

compensation. “By the end of the 1980s,” Banks writes, “the prestige of the individual writer superseded the notion of craft solidarity or faith in the WGA’s capacity to be a strong representative for its members… [The Guild’s] membership — and members’ needs — became increasingly diverse.”[50]

At a time when fostering solidarity was critical for ensuring equitable conditions for writers in the developing corporate landscape, screenwriting software offered itself as technology tailored to the individual and their disparate, personalized needs. The technology would “meet you where you are,” per se, promote self-sufficiency, and provide guidance in the entrepreneurial dimensions of spec script selling. A 1992 ad for SuperScript Pro (Inherit the Earth Technologies), seen in Figure 3, appeals to both extremes of the screenwriting spectrum: the humble self-starter “typing “FADE IN:” for the first time in your life,” and the hot shot “readying a million-dollar script for production.”[51] References to these two extremes, as will be seen later on, do not often have the effect of implying a middle existence, to the detriment of accurate conceptions of screenwriting work. The result of this appeal is a sobering innuendo about the screenwriting community’s economic hierarchy.

[50] Banks, 158.

[51] SuperScript Pro, advertisement, *Writers Guild of America, West Journal* 5, no. 1 (December 1992): 48.

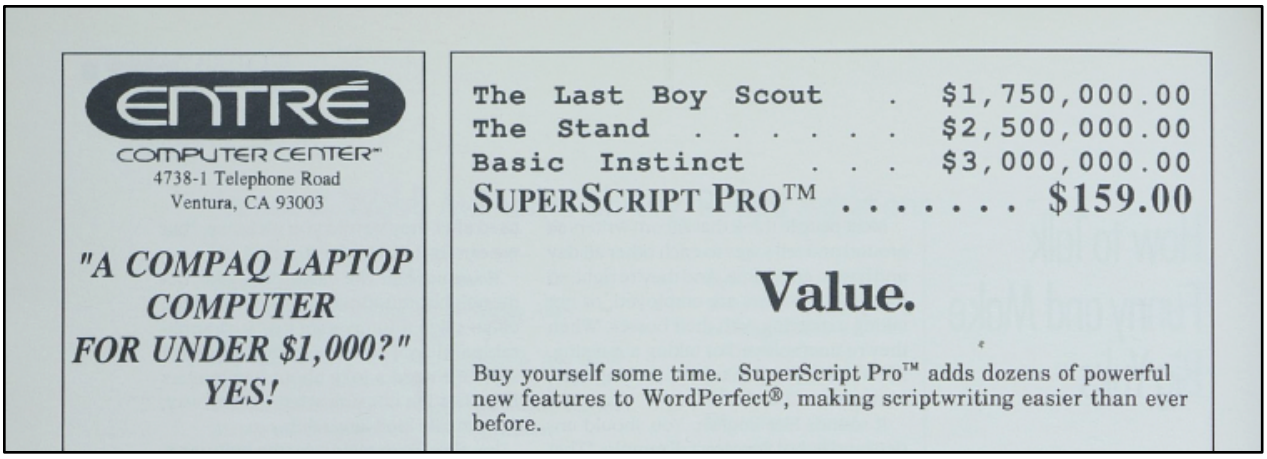

Figure 3: An ad for SuperScript Pro downplays the up-front investment in screenwriting software by comparing it to recent, historic spec script sales. SuperScript Pro, advertisement, *Writers Guild of America, West Journal* 5, no. 1 (December 1992): 48.

At the very top of the ad we see an itemized list: "The Last Boy Scout...$1,750,000.00. The Stand…$2,500,000.00. Basic Instinct…$3,000,000.00. SuperScript Pro…$159.00." The inclusion of the double zeros after the decimal points seems excessive considering the insignificance of cents in these multi-million-dollar figures, which we presume are the prices fetched for the sale of these scripts. But it is clear the ad is going for excessive, to underscore the spectacle and extravagance of the profits. That the list is set in the iconic industry-standard screenplay font, Courier, only accentuates the matter-of-factness of its association with authentic industry transactions, though this is taken for granted. Even while we know these figures represent the upper echelons of the profession, the numbers are staggering, and like lottery jackpots, they entice us to abandon rationality and imagine. The price of SuperScript Pro is made to seem minuscule through the implication that $159 is a start-up cost allowing participation in the lucrative marketplace of scripts. Through subtle class shaming, the ad discourages a sober assessment of the true cost, still sizable today, of both the software and the hardware to run it. Not coincidentally, the ad shares the page with a listing from Entré Computer Center in Ventura, California, touting its Compaq LTE/286-20 laptop as a bargain for coming in under $1000

($995).[52] The list design acknowledges the widening economic divisions between working screenwriters while at the same time implying that these divisions are surmountable through confident investment in the right software. There is some concession to the budget-consciousness of the aspiring screenwriter, in the form of the big, bold heading "Value" above descriptions of the software's features. I would still question the sincerity of this appeal given its placement immediately after the list, which renders it on-the-nose and faintly patronizing. In case the reader would think this judgement too cynical, I offer the final line as a suggestive coda: "What have you got to lose…except more time?"

Even if marketing rhetoric predictably simplified the pressures facing screenwriters at this time, it also highlighted genuine anxieties. Just as with workers in all sectors of the neoliberal economy, changes in corporate structures and renewed enthusiasm for free market competition created working conditions dependent on high degrees of self-management and determination (or, self-exploitation). In exchange for taking on the interests of management as one's own, the worker receives, so the logic goes, increased autonomy and greater opportunities for profit and fulfillment. For screenwriters, this meant the completion of a decades-long transition from the studio era work-for-hire contract system, traditionally non-autonomous but steady and institutionally supported in the form of consistent wages, a dedicated work space in close proximity to other creative personnel, and, in the 1970s especially, opportunities for collaboration with other above-the-line creatives.[53] By comparison, the 80s and 90s saw the rise of the spec script as the standard model for screenwriting labor. The spec script, by virtue of being non-commissioned by a studio or production company, is fundamentally a "gamble" in

[52] SuperScript Pro, advertisement, 48.

[53] Banks, *The Writers*, 7,14.

which the screenwriter spends months of time and energy (typically alongside full-time or multiple part-time jobs) creating a script they hope to sell in the future.[54] In the absence of institutional support, the screenwriter takes on an extra burden to develop self-sufficiency and flexibility — and not only within their comfort zone of story, character, and dialogue. Screenwriters, under the spec script model, are expected to become more left-brained when conceptualizing their work, considering their script's marketability (both to studios and to audiences) and how this could be highlighted in a pitch.

The idea that computers could help ease the burden of self-sufficiency found its way into screenwriting work culture, in part, through screenwriting software. Programs are frequently anthropomorphized as "virtual writing partners" offering automated forms of assistance. Ads for Dramatica Pro (Screenplay systems) declare it the "ultimate writing partner" which listens as "you tell Dramatica your intent" for the story.[55] Sensationalist marketing aside, reviews for screenwriting software throughout the 1990s point out how these programs are "ideal…for writers working alone"; how they allow you to "bounce ideas off someone, the way you would with a partner"; how they are "not quite Artificial Intelligence, more a friendly nagging colleague with whom one can brainstorm"; how, through the power of computers, these programs become "great for asking questions, forcing you to dig deeper — like having a writing partner."[56] These recurring characterizations gesture toward a widespread sense that for screenwriters, opportunities for fulfilling, creative collaboration seemed to be waning, even as corporate collaboration — i.e. synergy — was collapsing and reshaping industrial workflows and

[54] Banks, 7.

[55] Dramatica Pro 2.0, advertisement, *Writers Guild of America, West Journal* 9, no. 7 (July 1996).

[56] Stalter, "Intertainment: Audition: Dramatica, 'Virtual Writing Partner,'" 36; Chris Jones, "Speed Machines," *Sight and Sound* 6, no. 1 (January 1996): 33; Coleman, "The Story Structure Gurus," 14-21.

hierarchies. To be clear, I am not suggesting these programs successfully functioned as "virtual writing partners," or were capable of sustaining fulfilling collaborative experiences for isolated spec script writers. Instead, I want to highlight the industrial and cultural conditions that made such an idea seem desirable within the screenwriting community.

If not a utopian, autonomous virtual writing partner capable of replicating familiar collaborative experiences, screenwriting software could be understood as an ongoing means of connection to the community and a glimpse into trends in work styles, preferences, and tastes. In this way, I argue, it offered writers a symbolic form of "presence" — as a function and manifestation of community feedback. The association between these programs and the screenwriting community was facilitated by the convergence of developers and screenwriters as industrial identity categories. Developers engaged this slippage in the letters-to-the-editor sections of screenwriting journals, where they corrected errors in reviews, elaborated on details too niche for ad copy, and even disparaged reviewers who they believed were unfairly critical of their software. One of their most revealing tactics in these letters was to explain the role of feedback from "real" screenwriters in guiding design. Ultimately, these claims further associated the technology with the experiences and expertise of working writers. There is, in fact, reason to accept the validity of the "by writers, for writers" rhetoric beyond its marketing power. For one, developers are demonstrably eager to understand and engage the discourse around their products. They are active within the pages of journals both as contributors and readers, as evidenced by their detailed awareness of the perception of their products and the shifting concerns in the world of writers. Second, developers' claims to the "authenticity" of their products take advantage of the dwindling craft solidarity emerging out of the 1980s Guild strikes. As a result, their software

is able to appear more homegrown within the writing community (as opposed to tech outsiders) because the community has exploded.

Though in a literal sense Guild membership is verifiable, allegiances are not so black-and-white. It is difficult to separate, at times, software developers from the Valley from workaday screenwriters in Hollywood, even in their agendas and rhetoric. Following the Guild journal's publication of a comprehensive review of screenwriting software in July 1996, four self-described "writers who have switched from Scriptware to ScriptThing" take to the Letters section to cheerlead for their favorite program. "While we may not have agreed with all the opinions in the Journal article…we have not one qualm with Elaine Spooner presenting her personal preference of Scriptware as the best screenwriting software on the market. Our difficulty, is that her stated reasons for believing this are factually without foundation."[57] They continue, in commentary worth quoting in full to convey their tenor, "For example, Ms. Spooner states that Scriptware uses the Windows clipboard, but according to the Writers Computer Store [electronics shop in Hollywood], and confirmed by Scriptware tech support, the program does not do this…Additionally, Ms. Spooner states that Scriptware has drag-and-drop text manipulation. However, both TWCS [The Writer's Computer Store] and Scriptware tech support confirmed that there is only "limited" drag-and-drop." To justify such detailed critique, they write:

> We know that screenwriting software is far too important to writers for a program to receive such significant blessing as the best based on inaccuracies as these. While Ms. Spooner's opinion is just that, when one sees that she has based that opinion on facts

[57] Bog Logan et al., "Setting the 'Review' Straight," *Writers Guild of America, West Journal* 9, no. 8 (August 1996): 5.

which simply don't exist, then that opinion should be questioned by those who know better…and all those who want to know better.[58]

No doubt, ScriptThing developers would have been pleased to see someone off the payroll defend their product so passionately. Beyond their uncanny resemblance to marketing material, these writers' comments give insight into the sincere stakes attributed to published opinions about software at this time, and especially the power attributed to the Guild journal as an influence among screenwriters. Spooner's response, published immediately after, addresses the criticisms, then acknowledges the sensitivity to such errors: "Lastly, I am well aware that, in many cases, the choice of one software package over another is a very personal thing. And that once you find the one you like, you can be very loyal to it."[59] Clearly.

In other cases, screenwriter and developer are literally one in the same. Some screenwriting software companies, like those behind Scriptor and Final Draft, were founded by film school graduates and/or former screenwriters. (As with the self-help story gurus, the dubious quality and success of this experience can be a double-edged sword for their authenticity.) Even critics self-disclose investment in software and the growing technology sector. While covering the technology beat for the Guild journal in the late 80s and into the 90s, James Tugend celebrates the latest version of a program called Movie Magic (Comprehensive Video Supply) as a "first-rate" program that is "gaining wide acceptance, including major production companies," only to later concede, "perhaps I'm prejudiced because I helped design the program's "interface."[60] Elaine Spooner, too, though not affiliated with a particular program,

[58] Logan et al., "Setting the 'Review' Straight," 5.

[59] Logan et al., 5.

[60] Tugend, "Software That Delivers Scene After Scene," 40.

is described in her "Ultimate Screenwriting Software Review" as a partner in Water's Edge Communications, an interactive media production company.[61] Finally, in perhaps the most dramatic testament to the messy convergence of screenwriting and technology communities, the fracturing of writing experience along class lines, and the way software was believed to factor into shifting notions of belonging, we have the following submission to the Guild journal editors in March 1991: "distinctions made in The Journal between "wannabees" [sic], i.e. outsiders, and the implied "us" is disheartening. I used to be a software developer who liked to write. Now I'm a writer who develops software to eat. I don't wannabee a writer. I am a writer." The writer, David Prescott, continues, "The Guild feels to me like a closed society of incredibly competitive people."[62]

Attempts by developers to present their software as an extension of the screenwriting community also deflected some of the ambivalence toward computers and technoculture within their target audience. I propose we can make sense of this ambivalence by likewise contextualizing it within concerns about craft identity and shifting industrial hierarchies. As software developers and programming jargon become more prevalent within screenwriting journals, debates about membership and concerns about the fracturing of writers' shared experiences began to take on additional stakes. Questions emerged regarding who, ultimately, has the right to "fix" screenwriting — or even to determine that it needs fixing.

Writing in 1999 in their book *Digital Babylon*, technology writer John Geirland and Silicon Valley management consultant Eva Sonesh-Kedar describe the 1990s as a period of convergence leading to a cultural clash between "the geeks," "the suits," and "the ponytails,"

[61] Spooner, "The Ultimate Screenwriting Software Review," 38.

[62] Prescott, "A View From Without," 5.

respectively representing the computer, business, and artistic worlds.[63] Though we have already explored how clean divisions between these spheres at both the cultural and industrial level are dubious in light of hybrid roles and collapsed hierarchies, their account points to an awareness of the collision, if not merging, of these subjectivities previously considered distinct.[64]

While the affordances of screenwriting software in terms of automating script formatting were celebrated almost universally, there is evidence of an enduring but inconsistent reluctance to wholeheartedly incorporate these programs, if not at the industrial level — since, by the mid-90s, studios and high-profile figures were already using and endorsing such programs — then, rather, at the cultural level. At its most explicit and generalized, the stigma around screenwriting software posited it as a "nerd's" tool that invited a kind of logical, processual, dispassionate way of thinking that was counterproductive for writers. So strong was this stigmatization that even Robert McKee, arguably the most famous of the beleaguered yet massively successful story gurus, felt secure enough to openly ridicule the program Dramatica after its creators invited him to consult on the program. He says, "I came in, took a look and said, 'This is ridiculous'…'Only somebody without talent, a computer nerd, would think it was useful.'[65] Congratulatory write-ups on these programs predictably garnered resentment among screenwriters who were, apparently, being rescued from their woes by a technology with special insight into their profession. For their part, advertisements emphasized the ever-growing capabilities of these programs in indirectly dismissive slogans like, "If it were any easier, the script would write

[63] John Geirland and Eva Sonesh Kedar, *Digital Babylon: How the Geeks, the Suits, and the Ponytails Fought to Bring Hollywood to the Internet* (New York: Arcade Publishing, 1999), 4-5.

[64] It also stands as a fascinating attempt to reflect authoritatively on the "technology revolution" during a period of transition and instability and is worth a read for this reason, despite its occasionally hasty judgements.

[65] Nick James, "Interface: Waiter, There's a Script in My Soup," *Sight and Sound* 10, no. 4 (April 2000): 8.

itself."[66] Responding to backlash against these sentiments in 2000, Screenplay Systems co-founder Stephen Greenfield thought it best to re-assert the primacy of the creative individual (over the computer and the programmer), stating definitively, "these tools are no better than the person who uses them."[67]

Sight and Sound's Chris Jones, after suggesting screenwriting software represents "the beginning of a new era of writing," offers something of an explanation for these discursive tensions: "there is a mixture of paranoia and excitement when considering the implications of a manufacturing process that is reliant upon new technology."[68] "Reliant" is the operative word, as screenwriters seemed especially fixated on pressures to develop technological literacy as part of an imagined mainstream skillset. These pressures arose inevitably through use of word processors and screenplay software. They also manifested in an emerging culture of professionalization that encouraged Hollywood types to keep abreast of technological innovations, ostensibly to anticipate the "next big thing" but also, perhaps, as a way to anticipate threats to the economic order.

In references to this encroachment of technological literacy into the screenwriting toolkit, screenwriters and interested commenters mobilize tropes about computers and technology culture as a means of differentiating the artists from the engineers, the visionaries from the charlatans, and the superficial from the substantive. These tropes helped, mostly through negation, to re-define or re-affirm specific beliefs about the way screenwriting work should be performed. For instance, skepticism about this "technologizing" of screenwriting became paired

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[66] Final Draft, advertisement, *Written By* 4, no. 8 (October 2000): 57.

[67] Stephen Greenfield, "Response: To Screenwriting @ Your Fingertips," *New York Times*, January 23, 2000.

[68] Jones, "Speed Machines," 33.

with the trope of the defiant, anti-technology, "authentic" writer: "I can hear the snorts of derision from 'real writers'," writes one reviewer of Final Draft 5, "[and] see them biting down on their cheap cheroots as they bang all the harder on the keys of their 405 Remingtons: "Screenwriting software - pah! That's for suckers with no imagination."[69]

Additionally, screenwriting software ads framed claims of their program's intuitiveness and ease-of-use so as to appease writers reluctant to invest time and energy into learning their programs. The people behind SuperScript Pro assure us they have a "great manual" with "clear, concise tutorials."[70] We are warned against "wast[ing] time learning how a new scriptwriting program "thinks"," but are instead encouraged to "concentrate on the difficult task of screenwriting, not the technical intricacies of word processing." In the platonic ideal of software-assisted writing, as configured by ScriptPro and other companies using similar rhetoric, you can achieve "computer productivity without computer programming." Such a pointed turn-of-phrase suggests a self-awareness on the part of software developers about the stereotypes of computer use that could discourage potential users: first, for example, the idea that computers may be useful, but only to those who devote significant time and energy into learning how to manipulate them to their needs; second, that learning to use a computer makes one think like a computer, and thinking like a computer is not thinking creatively or artistically.

It is not by coincidence that Elaine Spooner's widely popular "Ultimate Screenwriting Software Review" lists as its first evaluative metric "How easy it is to learn and use".[71] For developers and users, it was best to downplay how far removed using the system was from the

[69] James, "Interface: Waiter, There's a Script in My Soup," 8.

[70] SuperScript Pro, advertisement, 48.

[71] Spooner, "The Ultimate Screenwriting Software Review," 24.

lofty, traditional images of screenwriting. The article includes hourly schedules for each company's tech support in the in-text tables, demonstrating the importance of such support in writers' purchasing decisions. Though emphasis on customer support says little in and of itself, in this context it reinforces the idea that technical knowledge can remain, even in a purely imagined sense, outsourced to peoples beyond the screenwriting community. In this way, screenwriting software became an object through which various sides could communicate beliefs about which forms of knowledge are appropriate for writers to foster.

In one revealing defense of Collaborator II by a member of the development team Louis Garfinkle, we see an attempt to explicitly intersect a rigorous, technical knowledge with a tradition of craft-based, artistic knowledge. In such defenses, the instruction manual becomes a critical text for acknowledging and attempting to bridge the gap between these knowledge bases. Garfinkle dismisses reviewer Jeffrey Sullivan's criticisms of Collaborator on the basis that the program's hefty manual could address all the issues described. Giving us a sense of the size of these manuals and, presumably, the amount of time that would be required to both read and produce them, Garfinkle writes, "I found myself truly enraged when I discovered that Collaborator's manual (which has more than 240 pages devoted to film story analysis) has been overlooked completely. We take special pride in our manual, and I take particular umbrage at any voice that fails to take it into account."[72] He continues, "Should this sound petty, imagine how you might feel if, having spent many years of your life, and many dollars, attempting to evince the quintessence of screenwriting, you found your work misconstrued." The technical manual is not simply a set of instructions or procedures one must master to make these programs run perform desired tasks, it also functions as a statement on the program's understanding of "the

[72] Louis Garfinkle, "Collaborator II: Point," *Writers Guild of America, West Journal* 8, no. 3 (March 1995): 4.

quintessence of screenwriting." Though this is one of the more fascinating quotations to emerge from this research, there is no evidence to suggest such exalted views were widely held. However, I do believe Garfinkle's defense is one of many indications, offered throughout this chapter, of a sense that developers were theorizing the craft through their programs. The intentional slippage between screenwriting software as a form of criticism, aligned with various traditions of narrative analysis, and as a utilitarian tool, more of a logic-based, even scientific instrument, informs both screenwriters' interest in and suspicion of the technology.

But in some cases, the experience of screenwriting software — even the pleasures — unavoidably evoked the excitement, wonder, and sense of self-discovery stereotypically associated with the world of "hackers" and computer geeks. Adam Rodman, a former member of the Writers Guild of America, West Board of Directors and secretary-treasurer, finds himself reminiscing about the "simple" times in writing technology, before the current "computer age."[73] His review of Scriptware opens suggestively with an autobiographical (and very writerly) account of his first time using the IBM Correcting Selectric II typewriter, then "the finest writing implement known to man." He muses, "I can still remember the grin on my face the first time I fixed a typo by hitting the "correct" key." His later experiences with "the first generation of…slow and clunky" computers were intriguing, but less so: "They crashed and lost material—but the things they could do with text!" Though he imagines the "perfect instrument for screenwriting" as containing "no complex formatting codes, no intimidating commands to remember," he goes on to describe the fun to be had in dealing with such technical components. Rodman describes experimenting with the program and discovering best practices through trial-and-error in an account that evokes the tinkering culture of computer "hackers." "I find myself

[73] Adam Rodman, "Review: Scriptware," *Writers Guild of America, West Journal* 8, no. 4 (April 1995): 43.

chafing against Scriptware's copy protection. After I installed my first version, I later compressed my hard disk, which somehow wiped out the hidden copy protection files. Scriptware subsequently refused to load. I got ahold of Steve Sashen [programmer and software company owner] and it took him about ten minutes to set me right over the phone." In a predictable payoff, Scriptware addresses many but not all of his previous misgivings about word processors, and, in the ultimate endorsement, is able to "[give him] back that "Gee, whiz" sensation."

In an interview with Stephen Greenfield of Screenplay Systems for the New York Times in 2000, Dana Kennedy astutely captures the way anti-technology sentiments and distrust of tech world intervention in Hollywood intermingle within the writing community: "Just in the last three years, with the help of the Internet, a booming new industry has sprung up around screenwriters or the hordes of would-be screenwriters. As a result, some say the art of the screenplay has been reduced to a crass science of strategy and high-technology, increasingly manipulated by so-called experts who promote what they claim to be the secrets to sure-fire hits. In fact, they may be contributing to movies that are more formulaic than ever."[74] In this case, the "experts" refers to both well-known story gurus of decades past as well as newcomers from the software world, like Greenfield, who prefer to "stay in the closet" about their tech projects because of perceived stigmatization. Noteworthy, too, is the coupling of "strategy" and "high-technology." Software, and by extension computers, are posited as instruments of a calculating, non-creative (or at least anti-originality) commercial production logic.

Where does screenwriting software fit into the larger discourse around technology in Hollywood at this time? As we have seen in this section focusing on the intra-craft perspective,

[74] Dana Kennedy, "NYT: Screenwriting @ Your Fingertips," *The New York Times*, January 9, 2000.

both defenses and celebrations of these programs positioned developers and technology enthusiasts as outsiders whose technical knowledge should be valued less than traditional forms of craft knowledge. Beyond this small corner of the discourse, digital technologies seemed to represent two opposing ends of the production spectrum: one the one hand, computers served commercial and financial interests by streamlining production, increasing the reliance on special effects (at the expense of story, according to a few writers in discussions of screenwriting software), and the downsizing of personnel.

On the other end of the spectrum, digital technologies became associated with increased authorial control through their use in independent production. The collapsing of hierarchies here (sometimes even to a single person) is given a romantic spin in this context, wherein an inspired individual or small team of guerilla artists can write, shoot, edit, and distribute films on their own (hence, "Do-it-yourself"). As opposed to the studio computers, these technologies, including digital cameras and editing software, empowered those outside the system and would allow for new, more creative forms of expression.

Gender and the Automation of Script Formatting

The automation of script formatting was and continues to be screenplay software's central contribution to the writing process. Formatting features unite all programs within this category, even those whose aims go beyond commercial production. Despite distinguishing three categories of screenplay software in her 1996 overview of the market, Elaine Spooner says they all perform the same basic functions: for example, they all "paginate your script with "More's" and "Continued's," prevent page breaking between character names and dialogue, generate consecutive scene numbers in the proper places and automatically generate page numbers. All of

them [also] have automatic ways to change from dialogue to description to character name to transition, and preset functions to generate commonly used "words" like "CUT TO" or "INT.""[75]

Simplicity, efficiency, intuitiveness: these were the selling points of early screenwriting software, and all had to do with formatting specifically. For writers, these programs made it easier to achieve a professional-looking script, even with minimal knowledge of formatting conventions, not to mention knowledge of the differences between types of scripts (film, television, stage, etc.).[76] Indeed, for those who know nothing about screenplay formatting, using such programs for the first time is an instructive experience; to use them is to learn the rules built into them.

The demand for automated formatting features speaks to the significance of standardized form in screenwriting craft. This was, above all, a pragmatic priority; even the most compelling scripts would be ignored if formatting was deemed inappropriate or intrusive by readers and executives. In an already highly competitive marketplace, mistakes or idiosyncrasies could betray one's amateur status and jeopardize potential business dealings. Formatting resources and expertise were thus essential to screenwriters' entry into the industry.

[75] Spooner, "The Ultimate Screenwriting Software Review," 24.

[76] Tugend, "Software That Delivers Scene After Scene," 40.

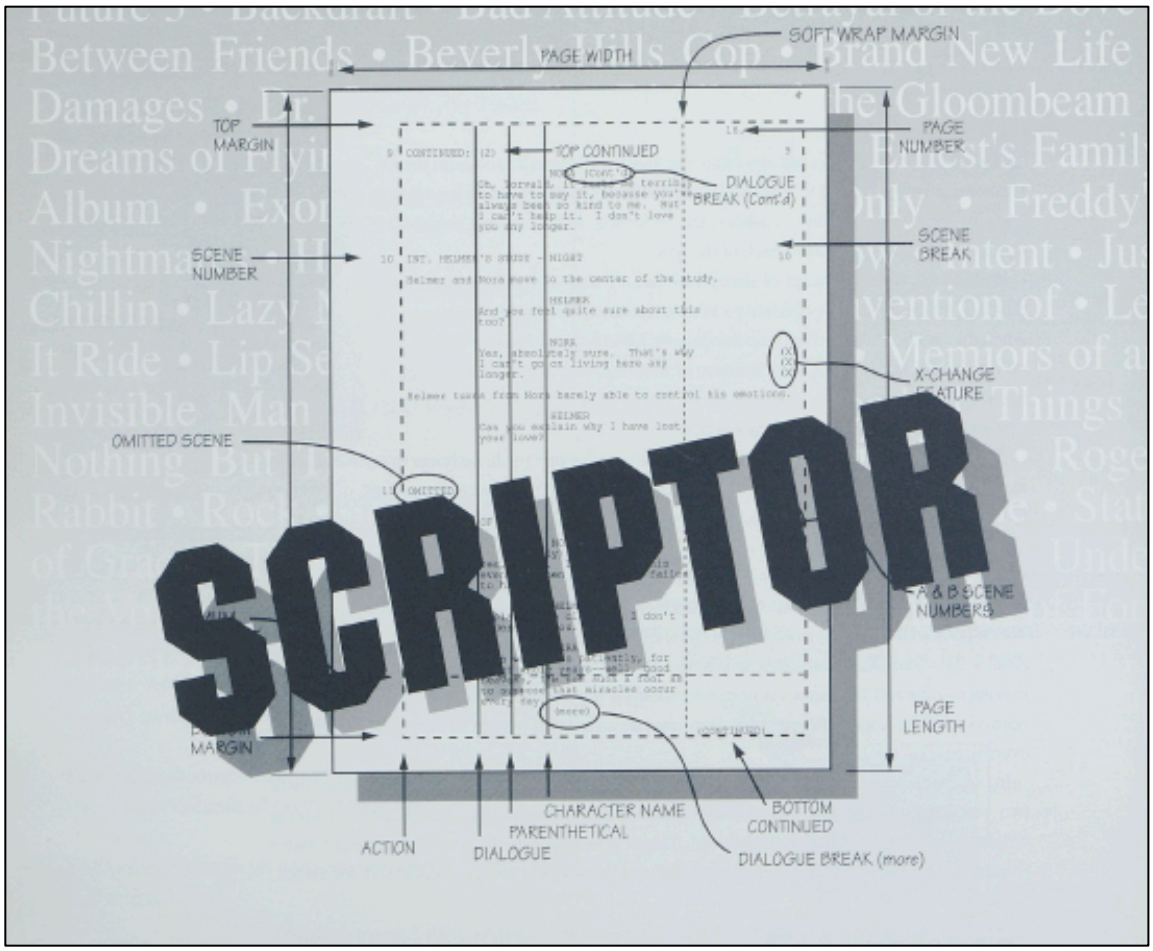

Figure 4: This Scriptor ad uses the visual language of technical drawings to convey the sophistication and rigid specifications of screenplay formatting. Scriptor, advertisement, *Writers Guild of America, West Journal* 6, no. 2 (February 1993): 4.

If formatting features were important to writers, they were even more so to software developers working to justify the existence of their products. Automated formatting features were the primary evidence marketers used to communicate the sophistication and value of their programs. That the features to achieve simpler formatting came standard right out-of-the-box was, moreover, the true novelty of these programs, compared to the previous generation of popular word processors that required tinkering or even some ingenuity to shape text to look like a conventional script. Advertisements throughout the 1990s touted ever-improving "formatting intelligence" and ensured writers their program would "[do] it all" — boasts based on an understanding of formatting as highly technical, time-consuming, and challenging work.

Consider the blueprint-like rendering of the script page in a 1993 ad for Scriptor (Screenplay Systems), in which lines mimicking dimensions in architectural prints adorn all four sides of the page, indicating multiple layers of indenting, while circles and arrows trace labels to various formatting components. The message was twofold: that formatting a script is no easy task, and that screenwriting software is equipped for this task and will help writers reduce the time, effort, and know-how required to produce a professional-looking script.

Prior to the mainstreaming of screenwriting software's formatting features, writers relied on a network of independent script printing professionals and services led primarily by women. The strength and size of this sub-industry can be seen in the plethora of ads placed in screenwriting journals offering to help "clean up" one's script, edit it, format it, and do whatever else was required to make it look and read properly. The prototypical ad opts for simplicity and directness: "The Write Type Word Processing Service. Scripts, Novels, Transcription. Reasonable Rates. Fast & Accurate Service. LASER PRINTING. Call Donna, (818) 349-9159."[77] Others wanted to emphasize their understanding of writers' needs: "Screenwriters. Before someone important sees your screenplay, give yourself that competitive edge. Professional script reader will do specialized notes and coverage on your completed screenplay. Confidential. Kathy (213) 288-1160."[78] Almost all feature names historically gendered as female. On one page alone from a 1991 issue of the WGAW journal, we are asked to Call Anne, Rachel, Maxine, Jenny, Patsy, Vicky, Shirle, Alyce, Barbara.

Others have written extensively about the gendered divisions of labor that fostered women's professional development as typists and clerks, both in the mid-century's emerging

[77] "Professional Services," *Writers Guild of America, West Journal* 4, no. 1 (December 1991): 54.

[78] "Professional Services," 54.

corporate office environment as well as within Hollywood studios. Erin Hill's exploration of clerical "women's work" in Hollywood emphasized the essential role women played in facilitating media production throughout the industry's history, especially as increasing bureaucracy and coordination efforts across departments required more records, papers, and reports. The fact that printing professional services in the 1990s, too, were primarily staffed and/or owned by women is certainly not an original point considering this work. Rather, these descriptions are meant to illustrate the degree to which the work of formatting was understood to engage these histories and how these gendered dynamics of labor would factor into the design and use of screenplay software. In some cases, the ads for typist services visually emphasized their identification with this tradition of "women's work." Legwork Writers Research Service, for instance, features an illustration of, what else, women's disembodied legs in heels, pantyhose, and a skirt. Alyce's Creative Services, replicating the stereotypical look of a midcentury-era secretary, features a drawing of a professional-looking woman (head, disembodied), studious and somewhat Disney-esque, with glasses, a Peter Pan-collared blouse, and a pencil holding in place a tidy bun. These representations form an important context for the framing of formatting labor in screenwriting software discourse, described below.

These services were not only essential for the production of scripts, they also held cultural significance within the screenwriting community. For many writers, having a manuscript re-formatted and printed for studio submission through one of these services was seen as both a confidence boost, since one's presentation would assuredly be executive-ready, and, in special cases, a "rite of passage" for budding scribes [cite]. Screenwriter Jack Epps Jr., in describing the "fabled" script processing house Barbara's Place, once located on Santa Monica Boulevard in West Hollywood, says "to have something formatted at Barbara's Place was like, "My god, I've

arrived." [The script would] read "Barbara's Place" on the last page, so that gave a certain cachet."[79] In other such descriptions, these women-led printing professional services are characterized as de-facto custodians of industry-standard formatting and binding practices. This is based both on their widespread use and the tendency of such services to hire former studio typists. In the 80s, Barbara's Place was known to have had "at least half a dozen employees" from the Warner Bros script processing department. The Warner Bros.' internally developed system of formatting became so well-known that writers would ask typists for "Warner Bros.' margins" when dropping off scripts.[80] The work of these women typists in shaping formatting conventions in the years just prior to screenwriting software's emergence was thus deeply integrated in the screenwriting community's professional milieu. Writers wanting to be taken seriously were expected to be informed of their value and purpose, and to avail themselves of their expertise accordingly.

The discourse around screenwriting software reframed the interpretation of script formatting as a valued form of expertise among screenwriters. This is partly, as hinted at above, a consequence of the demands of marketing. Automated formatting features were sold through characterizations of formatting as a nuisance, as unworthy of the time required to master its techniques, and most importantly, as ancillary to the creative process, which was consequently elevated in esteem by comparison. Such logic, espoused by marketers, developers, screenwriters, and other commenters, not only devalued the work of women typists and formatters, it also discouraged (or at least limited) an artistic understanding of script formatting then and into the future.

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[79] Nancy Kapitanoff, "A Word About Style: Avoiding the Margin of Error in Script Formatting," *Written By* 10, no. 3 (April 2006): 51.

[80] Kapitanoff, "A Word About Style," 51.

There are too many instances of dismissive language directed at formatting skills to include here, but a few of the most revealing in terms of the large-scale consequences of this attitude are given here. First, formatting is described in various contexts as "drudgery," as "boring," as something one would rather not "worry about" while writing, and so on.[81] This characterization illustrates how formatting and script typing more generally had been historically feminized along the same trajectory as other Hollywood clerical work. As Erin Hill explains, "the feminization of labor is a process that has taken place, sometimes recurrently, in subsections of most major American industries over the past two centuries," and, in Hollywood as in elsewhere, it involved women being "hired for the so-called scutwork — the most routine, tedious, menial, and repetitive jobs in the factor or office."[82] The understanding of formatting as a mindless chore belied both its importance in industry work (determining shooting schedules, location budget, casting, camera setups, special effects usage, production design, etc.) and its status as a historically contingent, creative practice whose conventions have changed, through conscious effort, over time (the preference for minimalism in prose as opposed to the once-common "CUT TO:").

Second, in screenwriting software discourse, formatting is explicitly distinguished from the "real" work of the screenwriter. Reviewers applaud programs for minimizing the distraction of formatting, which otherwise would "interfere with the creative process."[83] According to this logic, form is separate from a screenwriter's essential creative expression. A 1992 ad for Final

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[81] Spooner, "The Ultimate Screenwriting Software Review," 24; Guterman, "Screenwriting Software, Computer Metaphors"; Greg Gilpatrick, "Screenplay Software," *The Independent Film & Video Monthly* 27, no. 7 (September 2004): 50-52.

[82] Erin Hill, *Never Done: A History of Women's Work in Media Production* (New Brunswick, NJ: Rutgers University Press, 2016), 6.

[83] Spooner, "The Ultimate Screenwriting Software Review," 24.

Draft claimed the program "frees you, the writer, from worrying about how your script will look."[84] Not only are formal concerns separate, they are superficial. Such rhetoric creates a binaristic distinction between content and style that, considering the gendered nature of formatting work and the predominance of men in screenwriting, maps to heteronormative associations of masculinity with creativity and substance; relegating femininity to the domain of surface. "After you've done the creative work," one software reviewer writes, "you can format a screenplay faster and more uniformly than you could by hand. It harnesses the processing power of computers to focus on the boring parts of the screenwriting process. This means you can devote all your efforts to the real work. Isn't that what computers are supposed to do, whatever metaphor you use to explain them?"[85] The marketers at Screenplay Systems take this logic a step further in an ad for Dramatica Pro, a "story engine" designed to help with plotting, and Movie Magic Screenwriter, a more traditional formatter: "Great writing requires both art and craft!" It exclaims, and subsequently determines that Dramatica contributes the "art" (story creation, developing character psychologies, creating conflict) from the "craft" (achieving a "correctly formatted script."[86]

As described throughout this chapter, reviews of screenwriting software during this period follow a pattern wherein features that are not automated are typically targeted for criticism, particularly those that fail to create workarounds for unpleasant or tedious formatting tasks. In *Inventing the Medium: Principles of Interaction Design as a Cultural Practice,* Janet H. Murray explains how descriptions of user pleasures can indicate (un)successful design strategies

[84] Final Draft, advertisement, *Writers Guild of America, West Journal* 5, no. 4 (April 1992): 45.

[85] Guterman, "Screenwriting Software, Computer Metaphors."

[86] Dramatica, advertisement, *Written By* 2, no. 11 (November 1998): 56.

and appropriate design goals. Murray's framework opens a space for tracking shifts in understandings of formatting labor and its gendered associations within the architecture of the systems themselves. While terms like "interactivity" and "intuitiveness" are often used to praise digital systems (as they sometimes are in screenwriting software reviews), Murray argues these terms are broad and even misleading — the former for not differentiating between "good and bad interactions," the latter for discounting the tacit knowledge both designers and users draw from when engaging technologies.[87] Instead, Murray argues that successfully designed systems "[create] the satisfying experience of agency for the interactor," which she elaborates as: "This matching of the interaction's participatory expectations and actions to the procedural scripting of the machine creates the pleasurable experience of agency. Bad design frustrates the interactor by creating consuming or unsatisfiable expectations, or by failing to anticipate actions by scripting the machine with appropriate responses."[88] Privileging the "interactors" expectations, pleasures, understanding of the task, and sense of agency in the design process, and in any evaluations of its success, means in the case of screenwriting software, elevating primarily white, male beliefs about the craft that further devalue the expertise of women who made livings in the script formatting business. It is not a given that because "the most appropriate elements for design are always those that increase rather than obstruct the agency of the interactor," as Murray writes, screenwriting software's pleasures must derive from the minimization of time and focus on script formatting.[89] Screenwriting reviews and even the ads for software accept and amplify complaints

[87] Janet H. Murray, *Inventing the Medium: Principles of Interaction Design as a Cultural Practice* (Cambridge, Mass: MIT Press, 2012), 11–12.

[88] Murray, *Inventing the Medium,* 12–13.

[89] Murray, 13.

from male writers that formatting is confusing, difficult, and tedious, which speak equally in these contexts to the quality of the software and to the nature of screenwriting itself.

The automation of formatting via software thus required a contradictory understanding of formatting knowledge and technique. Formatting work was positioned as monotonous drudgery that only served to distract from the truly demanding, "creative" work of writing story, on the one hand. This characterization emerged in the context of the feminization of script formatting. Formatting work was then reframed as complex and requiring impressive technical skill only when it served to demonstrate the sophistication of software. The ability to produce a well-formatted script proved the intelligence of software and, by extension, its predominantly male developers. Formatting knowledge and skills became secondary, but essential to, the demonstration of technical mastery, as evidenced by detailed discussions in screenwriting journals about inefficiencies in keyboard shortcuts or interface design, and suggestions for optimum computer settings to achieve proper formatting. In these discussions, which describe frustrations with technical errors and trial-and-error methods of testing programs, the tedium of optimizing one's software and technical skills is not framed derisively, but rather as a critical part of the experience of computer-based screenwriting. In this way, the feminized field of script processing became part of a masculine discourse of technology, efficiency, and male technical prowess that reinforced gendered conceptions of creativity.

Coda: The Misleading Banality of Screenwriting Software

A curious production professional arrives at the 7th annual Showbiz Expo held at the Los Angeles Convention Center in June of 1990, having been lured to the three-day trade show — the "World's Fair of Film and Video" — by the promise of "provocative seminars, exhibits and

special attractions" related to film production technology.[90] The attendee, perhaps a locations manager, post-production worker, or maybe even a writer, explores the booths with varied interest, passing live demonstrations of computer graphics programs, high-definition video cameras, and, inexplicably, trained animal routines.[91] They arrive at an exhibit from one of the emerging screenwriting software companies, where the developers are a little too eager to explain how their program will revolutionize the age-old writing process. Their software is evidently the biggest innovation since Aristotle's three-act system. After all, it makes formatting page breaks automatic, they say, unlike in the popular word processor programs. It has an improved spell-checker that requires slightly fewer minutes to scan an entire script file than does last year's version. It takes advantage of the latest innovations in computer interface design, including pull-down menus and function keys, minimizing (but not eliminating) the technology literacy required to navigate and operate it. And it is already in use within so-and-so major studio's writing department.

Is this sales pitch for screenwriting software adequately "provocative" for the attendee? Does it capture their imagination with suggestions of a future 'technologized' Hollywood? Or is the technology already boring? It is hard to say whether the *experience* of this or any other technology was truly one of amazement or whether the wide-eyed deference to newness and "provocativeness" were merely performative in the documentation from the time of screenwriting software's invention. A pattern emerges in screenwriting software discourse where critiques of the programs become referenda on the use of computers more broadly, which highlights the association between this specific innovation and the wider world of digital

[90] Showbiz Expo '90, advertisement, *Writers Guild of America, West Journal* 3, no. 4 (April 1990): 41.

[91] Showbiz Expo '90, advertisement, 41.

technologies. The software never represented one innovation, but rather many — and some yet to come. The ability of screenwriting software to stand in for *all* digital technologies in the sources described below underlies but does not *undermine* this chapter's emphasis on the singular impacts of screenwriting software, as it is understood within a circumscribed group of Hollywood personnel.

Today, screenwriting software's mundane function should not render it unworthy of our attention — rather, as Wendy Chun writes, "our media matter most when they seem not to matter at all," when they structure experience without capturing our imagination.[92] Even beyond novelty-based rhetoric, reviews and advertisements from the time gesture toward a professional duty (or sense of guilt) to keep tabs on screenwriting software whether one wants to or not: "As a production professional," reads one ad for the Showbiz Expo, "it's your business to know how show business is changing."[93] Provocative or mundane, then, screenwriting software should be understood as representing one of many looming changes digital technologies promised to bring to Hollywood's working order. The evidence for this interpretation comes from sources like Chris Jones' 1996 piece for *Sight and Sound* exploring emerging digital tools – "speed machines" – used in film and television production. Jones observes the role of these technologies in reducing overhead costs and streamlining Hollywood production, ultimately, he argues, leading to job insecurity for countless production personnel. "Consequently," he says, "there is a mixture of paranoia and excitement when considering the implications of a manufacturing process that is reliant upon new technologies," including screenwriting software, though Jones

[92] Wendy Hui Kyong Chun, *Updating to Remain the Same: Habitual New Media* (Cambridge, MA: The MIT Press, 2016), 2.

[93] Showbiz Expo '90, 41.

stops short of suggesting this software poses any threat to writing labor.[94] It thus existed as an object of interest not just for those who might use it, but also for diligent observers of the pending "digital revolution."

[94] Jones, "Speed Machines."

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Chapter 2
The Empirical Strikes Back: Big Data Science in Streaming Television

This chapter explores what I am calling Hollywood's "culture of empiricism" in an effort to contextualize and further historicize the growing body of research on data analytics in the entertainment industry. I contend that the supremacy of "big data thinking" within contemporary media production cannot be fully understood or explained without asking why studios, networks, online media companies, streaming services, and even individual creative workers consider computer science, engineering, and statistical analysis prudent models for media-making to begin with. As will be shown in more detail below, entertainment media entities offer wide-ranging appeals to scientific rationality in justifying new production methods, management strategies, the use of new digital tools, and even creative decision-making procedures. Characterizing these appeals as products of a "culture of empiricism" is an attempt to highlight the historical circumstances in which appearing to be backed by science (broadly interpreted) is advantageous to media companies.

Historical accounts of this period of media industry should not be content to attribute Hollywood's interest in datafication to the influx of digital technologies, or to the sheer volume of these technologies' insights. How have today's tools and methods come to be understood as

superior to previous forms of quantification and audience measurement, and why? Moreover, what do these answers suggest about Hollywood's unspoken hunches about business and creativity? Scholars have already begun the critical work of investigating how media companies harvest, process, and analyze massive amounts of data through consumer tracking technologies. Such work includes: Amanda D. Lotz's ongoing procedural analyses of Netflix; Mark Andrejevic's polemical study of consumer surveillance and instrumentation; Jennifer Holt and Kevin Sanson's studies of the purpose-built corporate networks that merge Hollywood's and Silicon Valley's infrastructures. Still others are probing the premises of data-driven media; Mattias Frey, for instance, has questioned the novelty of algorithmic recommendation systems by showing how these systems remediate traditional forms of cultural moderation. In describing the large-scale orientation of media enterprise toward data collection and machine learning, these scholars argue that Hollywood's enthusiasm for analytics and quantitative research cannot be written off as corporate rhetoric — though at times it certainly functions as such.

In the vein of historians of science like Theodore Porter, Ian Hacking, and Sandra Harding, this chapter explores Hollywood's datafication and appeals to objectivity as "artificial regimes" structuring the social production of knowledge.[1] This chapter thus adopts an admittedly precarious position; on the one hand, it must remain critical about how various scientific disciplines are serving as methodological and philosophical models for media work, even when these models appear to be (mis-) appropriations rather than valid applications. On the other hand, it must also acknowledge that media companies, most notably Netflix, have successfully applied (read: profited from) forms of quantitative research in the entertainment sector. This study is, emphatically, *not* a bad-faith attempt to expose Hollywood science as lacking in rigor. Neither is

[1] Theodore M. Porter, *Trust in Numbers: The Pursuit of Objectivity in Science and Public Life*, (Princeton, NJ: Princeton University Press, 2020), 44.

it an attempt to reframe all of data analytics as a purely cultural construct, à la Alan D. Sokol's stunt "critique" of the humanities (via physics), "Toward a Transformative Hermeneutics of Quantum Gravity."[2] The scientific ambitions of companies like Netflix sometimes deserve to be taken seriously, even as they must be considered alongside and even *as part of* the cultural discourse around quantitative methods in Hollywood. Ultimately, whether a given technology, system, or procedure is understood to be valid, novel, or sufficiently "scientific" matters less in this analysis than the way Hollywood's varied internal logics make these things meaningful. If "numbers create and can be compared with norms," what norms are flourishing in Hollywood's version of science?[3]

This chapter explores these questions in two sections. Each investigates an explicit attempt to merge traditions of Hollywood production with innovations in computer science and engineering, audience tracking and measurement, and machine-assisted creativity. The first section is a deep dive into Netflix's published research, accessible on their sister websites: *Netflix Research* and the *Netflix Technology Blog.* Both serve as employee and investor recruitment resources offering a curated (read: trade secret guarded) glimpse of projects-in-progress, lessons on the use of fundamental computer science or mathematical principles in their services, and retrospective analyses of successful data-backed product experiments. This section analyzes the application of scientific concepts in Netflix's research and connects the company's stated beliefs about experimentation and technology with its broader corporate strategies, thus highlighting the difficulty of separating science from strategy. It also draws from historical

[2] Stephen Hilgartner, "The Sokal Affair in Context," *Science, Technology, & Human Values* 22, no. 4 (1997): 506–22.

[3] Theodore M. Porter, *Trust in Numbers*, 45.

accounts of the audience measurement industry to understand how numbers function differently in today's Hollywood than in the previous eras.

The second section explores the data analytics consulting industry and its role in establishing data analytics as a form of meaningful expertise in Hollywood. This section begins with a close reading of a study from 2019, *Entertainment Science: Data Analytics and Practical Theory for Movies, Books, and Music* by Mark B. Houston and Thorsten Hennig-Thurau. The 1,000+ page volume is one of the more ambitious attempts to merge industrial and scientific rationality through a hodgepodge of disciplinary influences, including but not limited to: biology, cognitive science, game theory, and psychology. This source merits a dedicated inquiry given its rhetorical effectiveness, its idiosyncratic influences, and its identification of cultural values (namely "conservatism and traditionalism"[4]) as shaping the development of data analytics technologies in Hollywood. *Entertainment Science* provides a useful starting point for exploring how data consulting firms work and how they define their contribution to entertainment media production.

Building the Netflix Brand…of Science

Netflix's connection to science in culture and business arises from its development of digital technologies to improve film and media production. These diverse technologies, ranging from its well-known recommendation algorithms to private cell towers,[5] allow the company to: collect and analyze viewer data, tag its media collection to promote personalization, automate the

[4] Thorsten Hennig-Thurau and Mark B. Houston, *Entertainment Science Data Analytics and Practical Theory for Movies, Games, Books, and Music* (Springer International Publishing, 2019), chap. 14, Kindle.

[5] Janko Roettgers, "Netflix's Secrets to Success: Six Cell Towers, Dubbing and More," *Variety*, March 8, 2018.

creation of promotional materials, improve streaming quality and speed, and even determine optimal locations for production.[6] By highlighting these technologies in its marketing (and even its user interface design), Netflix links itself to the worlds of science and mathematics — specifically computer science and engineering, artificial intelligence, machine vision, and data analytics. Is there anything being gained in this linkage beyond the obvious material benefits of venture capital, eager recruits from STEM programs, and possibly cultural prestige?

In popular culture and trade press coverage, Netflix's superior technologies represent the company's "secrets to success"[7] and its "terrific advantage"[8] in deciding what media to produce and how to do so efficiently. In much of this coverage, Netflix's established success positions it as a symbol of the possibilities (and limitations) of solving Hollywood's problems with quantitative and technological solutions.

Bruno Latour has argued that the fates and functions of science and technology are inseparable, and indeed, Netflix embodies Latour's "technoscience"[9] in its material dependence on "black box algorithms"[10] and the company's recognition that (its own) human networks define what constitutes knowledge. For instance, in the famous Netflix Culture Deck, Reed Hasting and Patty McCord intentionally blur the lines between the company's employees, its technologies, and its scientific approach to media industry in the mantra "Highly Aligned,

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[6] Allen Yu, "How Netflix Uses AI and Machine Learning," *Medium* (blog), October 1, 2019, https://becominghuman.ai/how-netflix-uses-ai-and-machine-learning-a087614630fe.

[7] Roettgers, "Netflix's Secrets to Success."

[8] Alexis C. Madrigal, "How Netflix Reverse-Engineered Hollywood," *The Atlantic*, January 2, 2014.

[9] Bruno Latour, *Science in Action: How to Follow Scientists and Engineers through Society* (Cambridge, MA: Harvard University Press, 1988).

[10] Libby Plummer, "This Is How Netflix's Top-Secret Recommendation System Works," *Wired UK*, August 22, 2017.

Loosely Coupled," which utilizes the terminology of software engineering to describe the ideal corporate structure for a streaming service.[11]

Most of what is known about Netflix's use of technologies comes either from Netflix itself or from journalists and scholars who must invent creative ways to circumvent the company's informational blockades.[12] Nevertheless, and with much contradiction, the company cultivates a scientific persona that idealizes a form of objectivity based in experimentation. Consider the aspirational declaration on its *Research* home page: "Across the company, we strive to run experiments to back our hypotheses up with evidence, which often uncover surprises that redirect or refine our research."[13] Historically, striving for objectivity through experimentation has involved repudiating personal or local forms of knowledge in favor of abstracted knowledge theoretically replicable by anyone, anywhere, any time.[14] Tech companies like Netflix have so far resolved the contradictions of evoking such a conventional understanding of objectivity — based in the impersonal analysis of their massive stockpiles of data collected in equally impersonal ways — by instead advocating a *replacement* of one local knowledge (Hollywood's) for another (their own). Its self-serving interpretation, crucially, admits the impracticality of outside verification of results and methods in order to excuse the competitive impulse to black box and trademark everything. Despite its iconoclastic reputation, Netflix's science is inextricably linked to Hollywood's traditional ways of knowledge- and decision-making.

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[11] Reed Hastings and Patty McCord, "Netflix Culture -- Seeking Excellence," *Netflix Jobs,* accessed March 29, 2023.

[12] Alexis C. Madrigal and Ian Bogost, "The Atlantic's Netflix-Genre Generator" (online application), 2014. https://www.theatlantic.com/static/front/html/netflix-generator/netflix.html.

[13] Netflix Research, "Homepage," accessed May 15, 2023, https://research.netflix.com/.

[14] Theodore M. Porter, *Trust in Numbers*, 22.

Netflix's interpretations of objectivity and experimentation therefore have political and cultural implications within the entertainment industry and its ever-shifting power dynamics.

This section explores Netflix's relationship to science as an adaptation to Hollywood's cultural and industrial conditions in the wake of Hollywood's ongoing convergence with Silicon Valley. It does so through a close reading of the *Netflix Research* website and the *Netflix Technology Blog* that tries to: 1) identify the underlying principles of "Netflix science", and 2) understand how the company moralizes and aestheticizes the scientific application of technologies in media production tasks. As Netflix has become an established player in the entertainment industry, skepticism about the company's technical capabilities has gradually given way to skepticism that the company is using these capabilities to achieve the potentials they claim. This represents a significant transition in collective understandings of Netflix and suggests, even in a case of sudden, humiliating collapse, the legitimacy of Netflix's desire to "engineer" film and television will endure. Now that Hollywood has internalized at least partially the values of Netflix's quantitative methods, it becomes the task of the media historians of the present to understand what corresponding beliefs — about art, industry, audiences — accompany this worldview. Or, in the epistemological terms of Duhem-Quine, what are the "auxiliary hypotheses" supporting a scientific understanding of media?[15]

The *Netflix Research* and *Netflix Technology Blog* sites offer insight into Netflix's public relationship to science and the scientific community, if not the most trustworthy or complete accounts of the company's inner workings. The company uses *Research* and *Technology Blog* to post research studies, video explainers, and infographics-heavy articles which: describe the company's goals in developing new technologies; chart the divisions of research within the

[15] Kyle Stanford, "Underdetermination of Scientific Theory," in *The Stanford Encyclopedia of Philosophy*, eds. Edward N. Zalta and Uri Nodelman (Stanford University, Summer 2023).

company; advocate management techniques that promote creativity and innovation; educate readers on foundational concepts in engineering and mathematics; suggest future research projects; and offer data-supported explanations for the company's successes and failures. The image of Netflix that emerges from these accounts of constant A/B testing and retrospective back-patting is not unlike Ian Hacking's "self-vindicating" science laboratory, wherein "any test of theory is against apparatus that has evolved in conjunction with it — and in conjunction with modes of data analysis."[16] The content facilitates the company's desire to serve as the entertainment industry's (over)eager ambassador for science-inspired experimentation. This chapter considers how these kinds of self-serving reinterpretations of concepts of objectivity and scientific methodologies reflect the conflicts and transformations taking place in the entertainment industry today, particularly those that converge around the application of digital technologies in media production.

Netflix continues to serve as the lightning rod within trade press for discussions of new media consumption trends, digital distribution techniques, and quantitative production methods — in other words, anything related to innovations in quantitative production methods. Netflix's reputation as the original standard bearer for a data-supported approach to media production and distribution was solidified through a handful of oft-repeated "defining moments": the company's improbable conquering of the Blockbuster home video empire through a user-friendly website; the highly publicized Netflix Prize competition (2006-2009) that offered $1 million to anyone who could improve the company's recommendation algorithm; the auspicious use of precise consumer data to predict the success and inform the creation of one of the company's first original series, House of Cards (2013-2018).

[16] Ian Hacking, "The Self-Vindication of the Laboratory Sciences," in *Science as Practice and Culture*, ed. Andrew Pickering (University of Chicago Press, 1992), 30.

In its own words, however, Netflix has a more complicated relationship to data analytics. Netflix Chief Content Officer Ted Sarandos is notorious for being one of the most outspoken champions of data analytics in driving creative production. At the corporate level, too, Netflix has touted its ability to use massive amounts of tracked data to provide superior content recommendations to users, all as a means of distinguishing itself favorably from legacy media makers whose production and distribution methods are made to seem antiquated and unresponsive by comparison. Even so, in recent years, Sarandos has made a striking reversal in describing the use of collected data to make creative decisions. In 2015, he described the decision-making process as based 70% on data and 30% on human judgment. In 2018, he inexplicably inverted this ratio to 70% human judgment and 30% data. Finally, in 2019 this figure became 80% human judgment and 20% data.[17]

[17] Matthew Ball, "10 Lessons for Disney, Apple, and All the New Streaming Companies Trying to Take down Netflix," *Vox*, November 12, 2019.

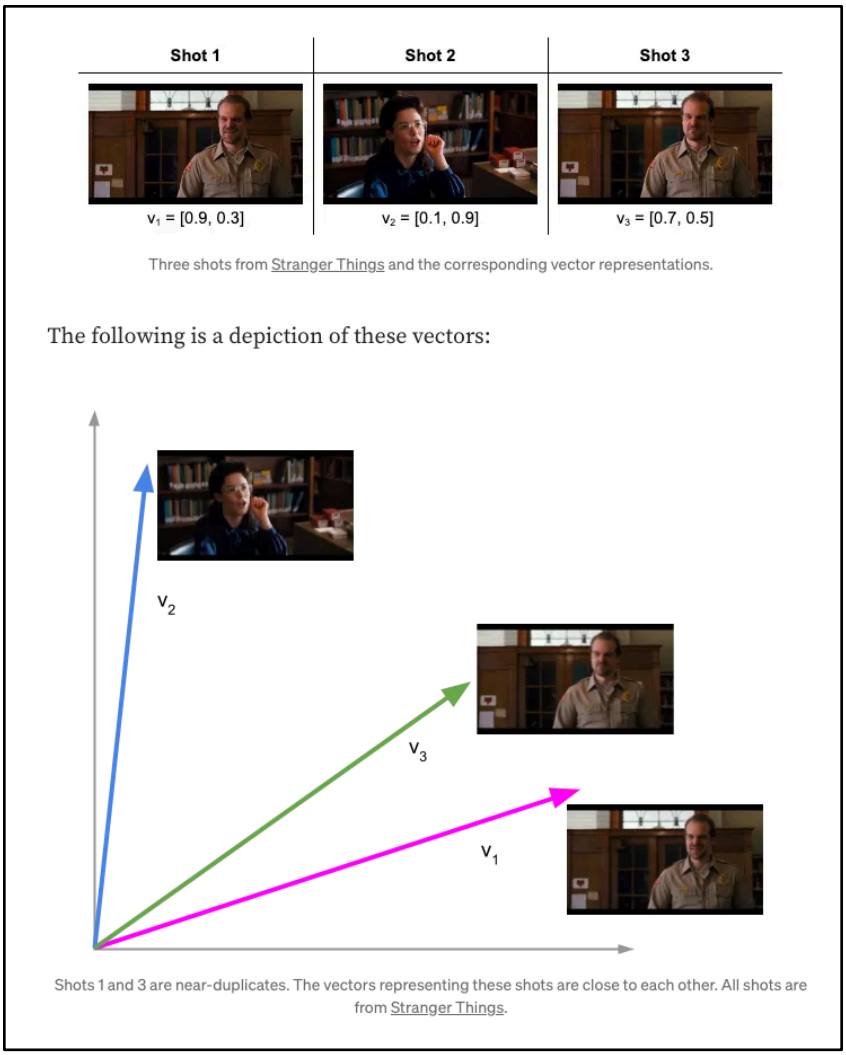

Figure 5: Netflix Tech Blog entry showing off the company's skill for producing polished, engaging science 'spectacle.' Boris Chen et al., "Match Cutting at Netflix," Netflix Tech Blog, November 17, 2022, https://netflixtechblog.com/match-cutting-at-netflix-finding-cuts-with-smooth-visual-transitions-31c3fc14ae59.

Acknowledging there is likely no practical correlation between these figures and changes in Netflix's actual production model since 2015, Sarandos' rhetorical about-face suggests exactly the kind of ideological instability regarding creativity and digital technology in Hollywood that this chapter investigates. Why might data-driven production no longer be fashionable for publicity departments, even as it continues to be a priority on the business and technical end? Former leaders of Hulu's and Amazon's streaming services Matthew Ball and Alex Kruglov offer this commentary, in an article addressed to a hypothetical executive in charge of streaming

strategy: "Your streaming data will make it easier for you to see which shows didn't work, but you will know that anyway. This doesn't mean you shouldn't tell Wall Street you're using a ton of data. But if you do, you'll also need to downplay its importance to talent. Remember, your service will not be successful if the creative community isn't happy. And they barely need your notes, let alone your numbers."[18]

This public backtracking continues in recent comments by Kevin Mayer, Chairman of Direct-to-Consumer and International at Disney. Describing the creative decision-making processes behind Disney+ content, Mayer downplays the company's dependence on data to produce quality television and film. It is clear in the interview that Mayer is directly attacking competitor Netflix and its association with algorithmically-produced content, which Mayer positions as an inferior form of artistry compared to Disney's studio-era belief in its employees' intuitions: "Creative processes fundamentally don't yield that kind of analytical look."[19] Mayer's comments come only a week after the launch of Disney+. I suggest this should be read as spin on the company's lack of stockpiled streaming data rather than a sincere philosophical reproach to data-driven production.

Beyond their insincerity, these remarks also obscure numerous other forms of automation that influence creative decision-making across the industry, in less visible registers that rarely double as publicity copy.[20] Instead, they take aim at an emerging (or continuing) tension within

[18] Ball, "10 Lessons for Disney."

[19] Emily Stewart, "Disney Says It Doesn't Need Data to Make Great Shows," *Vox*, November 19, 2019.

[20] For instance, Ramon Lobato tracks the rise of "digital intermediaries," referred to as multichannel networks (MCNs), as informal regulatory agents within the YouTube ecosystem. MCNs position themselves as adept at both supporting content production through technical and other forms of assistance to rising amateur (non-establishment) media makers, and at obtaining privileged bargaining positions when facilitating advertising deals with corporate clients. In doing so, MCNs create a layer of management around amateur talent in the online space not unlike that created by legacy media professionals like talent agents, managers, advertising agencies, and distributors (349, 354). What distinguishes MCNs from these traditional professions, however, is the "automated and uniquely scalable"

entertainment industry discourse between human forms of creativity (intuitive, inspired, authentic) and its automation through algorithms, artificial intelligence, and data analytics.

The fact that Mayer's and others' comments are largely rhetorical and not reflective of actual business and production models is critical. This public dialogue speaks to the multiplicity of discourses across varied sectors within the entertainment industry centered around the best ways to produce the "best" content. The statements above reveal a complex, active negotiation between newcomers from the tech world and legacy media makers over the way the broader public understands the industry's uses of data and digital technologies in creative production. In fact, the disconnect between these statements and actual industrial practices proves that ideologies about quantification, creativity, and technology have serious stakes which, in some form, reflect on the industry's bottom line.

This investigation owes a great debt to ongoing research in two primary areas: first, media industries accounts of Netflix's rise and influence, specifically as a model of quantitative methods; second, social studies of science and mathematics that look for connections between numbers, expertise, and power. Both areas offer their own explanations for how and why a form of scientific authority is taking hold in Hollywood. To set up more fine-grained analysis of Netflix science, this section briefly overviews the work most useful to this study.

The primary challenge for a study like this is the lack of complete information about the use and development of quantitative analysis tools within media companies. This study utilizes information where it is available and reads meaning into the structured absences where it is not. In many cases, Netflix's claims about viewership or the use of analytics intentionally relies on

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nature of their business models. By continuously signing creators to contracts and offering tiers of service that… …automate ad placements and support resources for lower-priority clients, MCNs can grow their ranks at an alarming rate. See Ramon Lobato, "The Cultural Logic of Digital Intermediaries: YouTube Multichannel Networks," *Convergence* 22, no. 4 (August 1, 2016): 348–360.

unverifiable numbers. Such instances make even clearer the need to study the social function of numbers in Hollywood. While Netflix is notoriously reluctant to reveal critical details of its technical systems, the company has a tendency to drop calculated hints about its methods or even tip its cap to journalists who successfully reverse-engineer its methods. These public acknowledgments intentionally toe the line between informative and promotional sensibilities and always aim to convey a sense that data analytics produce unquestionable insights by virtue of being backed by massive amounts of data.

For instance, in 2014, Netflix Vice President of Product Innovation Todd Yellin accepted a rare request for an interview after journalist Alexis C. Madrigal claimed to reveal all 76,897 "micro-genres" used by the company to categorize, organize, and recommend media in its library. The article, suggestively titled "How Netflix Reverse-Engineered Hollywood," does much to imbue Netflix's technical systems and designers with science- and engineering-inflected prestige and mystique. Madrigal's description of her research process — at first, tediously altering a single digit at the end of URL addresses, and later, using data scraping programs with the help of Ian Bogost — emphasizes the impracticality of trying to comprehensively delineate Netflix's tools. Yellin, who Madrigal describes as "my Wizard of Oz, the man who made the machine, the human whose intelligence and sensibility I'd been tracking through the data," encourages further wide-eyed speculation about Netflix's technical processes, explaining that Madrigal and Bogost have "merely skimmed one end-product of the entire Netflix data infrastructure. There is *so much more data* and a whole lot more intelligence baked into the system than [they've] captured."[21] In an explicit appeal to scientific grandiosity, Yellin describes how in 2006 his team dubbed the tagging system "Netflix Quantum Theory" for its underlying

[21] Madrigal, "How Netflix Reverse-Engineered Hollywood."

reliance on ""quanta," the little "packets of energy" that compose each movie.""[22] The high-minded metaphor, which Yellin concedes is "pretentious," positions Netflix engineers as the Intelligent Designers behind a deterministic Netflix universe. It is also symptomatic of the cultural legacy of physics as "the paradigm of scientific knowledge-seeking"[23] Finally, representations of Netflix's tagging system take the form of formulae — "Region+Adjectives+Noun Genre+Based On…+Set In…+From the…+About+For Age X to Y" — and thus use the visual language of mathematics to justify the article's ultimate conclusion: that Netflix has "a terrific advantage in their efforts to produce their own content…a database of American cinematic predilections."[24]

Moreover, investigative research by scholars like Amanda D. Lotz and Gina Keating has been able to circumvent Netflix's "black box" and illuminate the design principles and version histories of its famous recommendation algorithms. Such work is important in understanding how empiricism shifts its meanings, values, and goals even within corporate structures, where multi-layered business strategies encourage, in some contexts, tools to promote transparency and standardization, and, in other contexts, tools to promote productive confusion or mystique. For instance, streaming companies today have discovered the strategic advantages that can come from withholding or selectively announcing ratings. Media journalists Dade Hayes and Dawn Chmielewski describe the difficulty of valuing any specific kind of metric in this shifting industrial landscape: "Because most of the performance of streaming is shrouded in mystery, though, Hollywood would have less and less of a sense of what was working. A theatrical

[22] Madrigal, "How Netflix Reverse-Engineered Hollywood."

[23] Sandra G. Harding, *The Science Question in Feminism* (Ithaca, NY: Cornell University Press, 1986), 43.

[24] Madrigal, "How Netflix Reverse-Engineered Hollywood."

misfire…could be deemed a success depending on how many HBO Max sign-ups it prompted."[25] The frustration and confusion arising from conflicting metrics in ratings and audience behavior has, in the past, fueled industrial efforts to monopolize, in order to at least allow for smoother sales of advertising across media.[26]

Other scholars are building on this infrastructural and procedural research — which allow for critiques that can penetrate the marketing gloss of Netflix's self-disclosures — to understand how cultural narratives of data analytics support Netflix's model and thus shape the company's influence as a symbol of quantitative methods.

Mattias Frey's *Netflix Recommends: Algorithms, Film Choice, and the History of Taste* joins a host of scholars reading against the grain of the "new" to challenge the totalizing power of Netflix's data. Instead, Frey considers what functions of previous institutions, groups, and technologies are remediated through data analytics systems. While early accounts of the streaming platform indulged technological determinism by focusing on user-tracking technology as the company's differentiating factor, Frey (perhaps in an overcorrection) suggests we can learn more by viewing Netflix within the lineage of traditional criticism and promotion, like Leonard Maltin's Movie Guide, rather than tech companies like Google and its ubiquitous search engine.[27]

In making this argument, Frey is one of the few scholars to attempt a value-centric reading of Netflix's technological infrastructure, like the one proposed here. Frey makes valuable

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[25] Dade Hayes and Dawn Chmielewski, *Binge Times: Inside Hollywood's Furious Billion-Dollar Battle to Take Down Netflix* (New York: Harper Collins, 2022), 310.

[26] Karen Buzzard, *Tracking the Audience: The Ratings Industry from Analog to Digital* (Abingdon, Oxon; Routledge, 2012), 112.

[27] Mattias Frey, *Netflix Recommends: Algorithms, Film Choice, and the History of Taste* (Oakland, CA: University of California Press, 2021), 9.

connections between the design of Netflix's recommendation algorithm, once called Cinematch, to the company's website and application design, and to traditional forms of taste-making and promotion.

While his analysis focuses mostly on the procedural similarities between the technological and cultural, it provides a foothold into exploring the remediation and modification of beliefs about taste prediction and, thus, the ideologies that support use of data to inform or improve production. It does so in part by making a compelling case for the cultural charisma of algorithms and their tendency to obscure their mundane realities; Netflix's trademark personalization (or, at least, its ability to evoke the sense of it[28]) has drawn its power from the company's perceived innovation and technological prowess. However, this belief, fueled by marketing, emerged when engineering decisions were based in desires to replicate reliable forms of word-of-mouth recommendation. Drawing on Gina Keating's insider account of the company referenced above, Frey explains how Netflix's original, overarching "collaborative filtering" and "mentor group" methodologies, which bounced recommendations between users who rated content similarly, were based in a Bourdieu-like understanding of taste (wherein certain groups of users transmit aesthetic preferences) that assumed "taste can be articulated to a larger group after deciphering any individual's users' baseline of taste."[29]

Most relevant to this study is Frey's interest in the desires revealed in the narratives of algorithmic culture. Why (beyond profit) does Netflix seem eager to serve as a "blank slate for new-media fantasy projections of all sorts," and what effect do these fantasies have on broader

[28] This includes public relations blunders wherein attempts by Netflix to "personalize" the UI experience becomes a distasteful form of stereotyping or racial targeting; see the backlash over Netflix's strategy of prominently emphasizing minor characters of color in film/TV ads for subscribers of color. See Lara Zarum, "Some Viewers Think Netflix Is Targeting Them by Race. Here's What to Know," *New York Times*, October 23, 2018.

[29] Frey, *Netflix Recommends*, 73.

conceptualizations of media production and creative labor?[30] These questions move the conversation about data analytics use from reports on the activities of large corporations and engineers into the realm of the symbolic, the cultural, even the mythic — in other words, into an intellectual space where beliefs about creativity thrive. Frey's account is surely interested in raising these questions, and even offers a few interpretations about the basis of these beliefs in the culture of Silicon Valley; in these instances he routinely criticizes the tech world's rhetoric of revolution and disruption, as well as those leading the discourse — "an unholy pact between Netflix executives, novelty-hungry tech journalists, and shareholders" — but this account wished to take this task further, exploring the ramifications of stoking these desires so transparently, and, at times, duplicitously.[31]

The Other Kind of Experimental Film and TV

One of the key sources found in Netflix's *Research* and *Technology Blog* is a six-part series on experimentation. Like an unofficial supplement to the Culture Deck, the series offers itself as an urtext outlining some of the company's most deeply-felt philosophical and procedural guidelines for all types of decision-making. The first entry explains, in vague, marketing-friendly language – utilized commonly throughout the blog – that the goal of all experimentation at Netflix is to "deliver more joy and satisfaction to our members."[32]

[30] Frey, 100.

[31] Frey, 104.

[32] Martin Tingley et al., "Decision Making at Netflix," *Netflix Tech Blog*, September 7, 2021, https://netflixtechblog.com/decision-making-at-netflix-33065fa06481.

Content-wise, the entries are surprisingly dense and often veer into statistical theory to describe Netflix's favored methods for conducting experiments with interface design, the recommendation algorithms, and general technical efficiency matters. This illustrative impulse includes directing readers with hyperlinks to Wikipedia pages on "simple random sampling"[33] or to resources published by the American Statistical Association.[34] Tonally, the entries vacillate between a demonstrative mode, as if trying to rally a large room full of brand new employees ("Here, we'll go into the hard part: how do we use test results to support decision making in a complex business environment"[35]), an aspirational mode, which sounds like a form of corporate introspection ("Making decisions is easy — what's hard is making the right decisions"[36]), and a solipsistic mode, wherein the authors seem determined to refine the company's rationales past the point of practicality (they eventually concede that despite the perfectly weighted decision-making schemas described in the posts, "In practice, each person has a different framework for interpreting the results of a test."[37]

The series on experimentation illustrates how Netflix has constructed an approach to science that fully reconciles its methods with its business strategies and corporate values. A trope of technology journalism is to track tech companies' business strategies and identities back to their technologies, suggesting their founders' or employees' experiences tinkering on the devices

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[33] Martin Tingley et al., "What Is an A/B Test?," *Netflix Tech Blog*, September 22, 2021, https://netflixtechblog.com/what-is-an-a-b-test-b08cc1b57962.

[34] Alan Sokal, "A Physicist Experiments with Cultural Studies," *Lingua Franca* (May/June 1996): 62-64.

[35] Martin Tingley et al., "Experimentation Is a Major Focus of Data Science across Netflix," *Netflix Tech Blog*, January 25, 2022, https://netflixtechblog.com/experimentation-is-a-major-focus-of-data-science-across-netflix-f67923f8e985.

[36] Tingley et al., "Decision Making at Netflix."

[37] Martin Tingley et al., "Building Confidence in a Decision," *Netflix Tech Blog*, January 11, 2022, https://netflixtechblog.com/building-confidence-in-a-decision-8705834e6fd8.

altered their worldviews permanently. In his best-selling history of Google, Steven Levy writes, "The key to Google's success in all these businesses…is its engineering mind-set and adoption of such Internet values as speed, openness, experimentation, and risk-taking."[38] Netflix's explanations of its experimentation show how the science is built around the business as much as the business is built around the science.

Such an argument tries to extend and deepen critiques of the competing "institutional logics" between platform economy newcomers like Netflix and legacy Hollywood institutions. Business researchers Allègre L. Hadida et. al describe the competing logics as "commitment" (Hollywood) versus "convenience" (streaming services). Hollywood's commitment logic refers to the traditional importance of an optimal theatrical release for all decision-making — media companies "maximizing initial attendance by persuading audiences to commit to spending time and money to what is intrinsically an unpredictable experience."[39] By contrast, streaming services' "convenience logic" orients itself around maximizing service subscriptions and online traffic. Hadida et al. believe convenience logic emerged as "a product of advanced data analytics," thus suggesting how the technological rationality of this logic could become part of the "social process that underpins strategic decision-making."[40]

While Netflix engages in a variety of experiments with its platform at any given time, one of the key methodologies driving all its experimentation is A/B testing. This method has in fact become so central to Netflix's (and the tech world's) engineering processes that it has taken on a

[38] Steven Levy, *In the Plex: How Google Thinks, Works, and Shapes Our Lives*, (New York: Simon & Schuster, 2011).

[39] Allègre L. Hadida et al., "Hollywood Studio Filmmaking in the Age of Netflix: A Tale of Two Institutional Logics," *Journal of Cultural Economics* 45, no. 2 (June 1, 2021): 219.

[40] Hadida et al., "Hollywood Studio Filmmaking," 214–216.

life of its own as a corporate philosophy. Writing for *Wired* in 2012, Brian Christian calls A/B testing "the technology that's changing the rules of business" and Silicon Valley's veritable "governing ethos."[41] Netflix's incorporation of A/B testing is certainly not its own invention — Google and Microsoft are the most-cited inspirations for this methodology — but it does make the practice "its own" in the sense of adapting its techniques and underlying assumptions to support its success in the entertainment industry.

More precisely known as randomized controlled trial testing, A/B testing is an experimental design methodology that allows a researcher to test two or more variants of something to determine which version performs best, which is dependent on the context. When A/B testing was formalized by British statistician Ronald Fisher in the early 1920s, it was used to calculate optimal crop yields. In this case, separate, independent plots with differing soil compositions were compared according to crop growth rate over the course of a season. Today, A/B testing is a favorite method of web design and online commerce. An example use case involves an online retailer testing a design element of their site; say, the company wants to know whether a red or a blue "Add to Cart" button will result in more customer engagement. An A/B test would allow the company to host both versions of the site simultaneously — one with a red "Add to Cart" button and one with a blue — and divert traffic to each of these versions randomly, based on a predetermined sample size. Presuming the company considered sampling bias, selected an appropriate false positive probability (or p-value) tolerance, and let the experiment run long enough to result in a useful outcome, the end result would identify which color button resulted in the most engagement.

[41] Brian Christian, "The A/B Test: Inside the Technology That's Changing the Rules of Business," *Wired*, 2012.

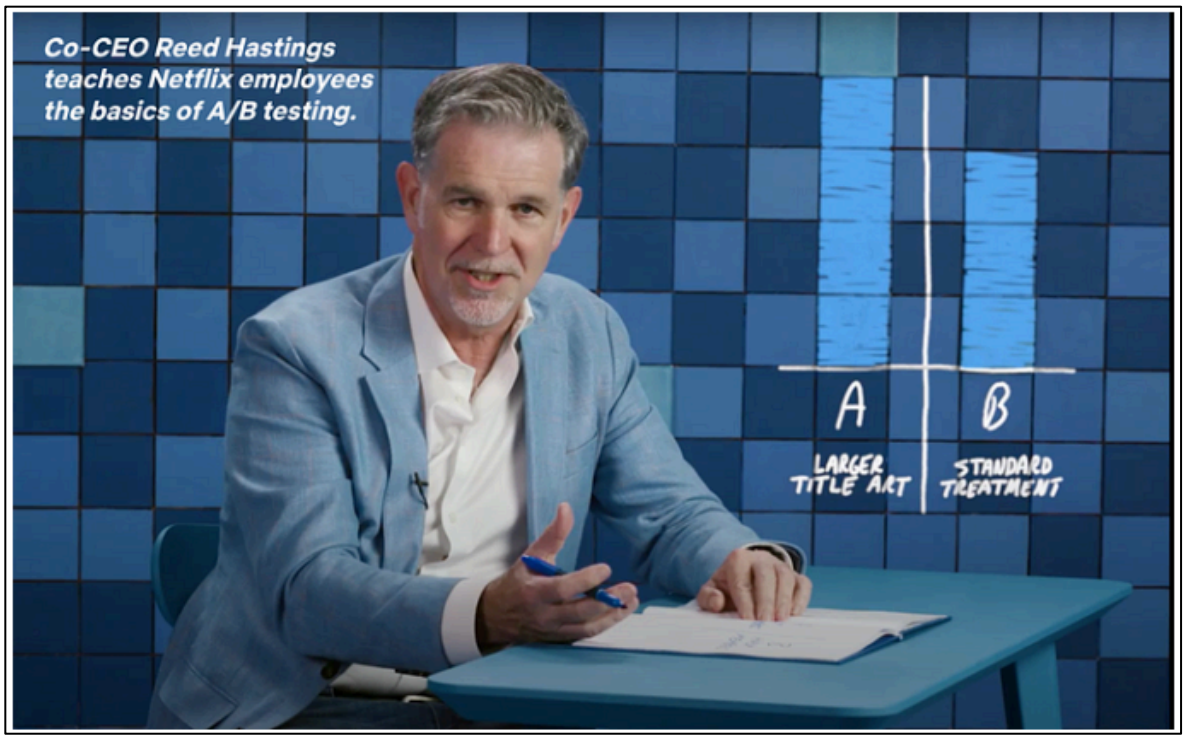

Figure 6: Netflix CEO Reed Hastings touts the power of the A/B test in internal training courses. Martin Tingley et al., "Netflix: A Culture of Learning," *Netflix Tech Blog*, January 25, 2022, https://netflixtechblog.com/netflix-a-culture-of-learning-394bc7d0f94c

One of the interesting consequences of using A/B testing at the scale used by Netflix and other tech companies is that there can never be a single, stable version of a given site or product. At any given time, multiple and simultaneous experiments are running and randomly diverting user traffic to multiple variations of Netflix with alternate artwork, interface orientations, default preferences, and so on. Analytics firms like Optimizely refer to this practice as "multivariate testing" if there is the additional complexity of multiple variables (a different color button and a button in a different location, etc.).[42] While, historically, quantification in industry has enabled a more centralized form of oversight, Netflix's application of A/B testing seems written to advocate for a more dispersed form of decision-making. The rationale for championing the methodology goes beyond its scientific validity; A/B testing practically and ideologically

[42] "Optimization Glossary: Multivariate Testing," Optimizely, accessed April 6, 2023, https://www.optimizely.com/optimization-glossary/multivariate-testing/.

supports Netflix's organizational structure and goals of creating a work culture more supportive of creativity and innovation than the rigidly hierarchical models from Hollywood's past. A/B testing can be more "objective" because it is a tool everyone can use and is not dependent on expertise of higher-ups.

Netflix contextualizes its use of A/B testing by comparing it to alternative decision-making practices, some of which obviously apply to this tradition of Hollywood's personality- and producer-centric business. "There are a number of ways Netflix could make decisions about how to evolve our product," says Part 1 of the experimentation series. A bulleted list includes: "Let leadership make all the decisions; Hire some experts in designs, product management, UX, streaming delivery, and other disciplines — and then go with their best ideas; Have an internal debate and let the viewpoints of our most charismatic colleagues carry the day; Copy the competition."[43] The running theme of these descriptors is a disdain for elite groups of decision-makers and their opinions. By contrast, A/B testing uses the scientific method to reduce the status of expert judgement, or, in tech world parlance, the "highest-paid person's opinion," also known as the "HiPPO."[44] Even as A/B testing is a ubiquitous methodology used by many of the largest tech companies, Netflix claims it as both a technical innovation and a cultural point of departure from its entertainment industry competitors.

Netflix's vocal support of A/B testing also exploits the methodology's privileged relationship to users, or, in this context, audiences. According to Netflix, A/B testing "gives all our members the opportunity to vote, with their actions, on how to continue to evolve their joyful

[43] Tingley et al., "Decision Making at Netflix."

[44] Christian, "The A/B Test."

Netflix experience"[45] When understood primarily as an instrument of "descriptionism," or the "view of mathematics as mere description," A/B testing puts audience preferences and behavior front-and-center. Brian Christian explains how this sensibility is translated into media production: "Where editors at a new site, for example, might have sat around a table for 15 minutes trying to decide on the best phrasing for an important headline, they can simply run all the proposed headlines and let the testing decide. Consensus, even democracy, has been replaced by pluralism — resolved by data."[46] Data is championed by Netflix both for its ability to reveal complexity and its ability to limit that same complexity. This malleability, which also limits alterity — an A/B test will always tell you which is better between A and B, but in turn discourages thinking of a C, D, Z, etc. — comes into play when most convenient for the company's argument or marketing need and thus signifies how effective the company is at adapting on-the-fly to perceptions about its use of data analytics.

Historian Theodore M. Porter explains how historical expressions of objectivity and quantification operate as ways of "making decisions without seeming to decide."[47] While Netflix's *Research* and *Technology Blog* posts go to great pains to explain the enduring value of human judgement — and how the company's scientists and engineers watch for statistical biases and unwarranted extrapolation of data — the company still aspires to an ideal of mass-scale experimentation that "provides a systematic way to make decisions or resolve conflicting viewpoints."[48] A/B testing is also a particularly friendly methodology for corporations like Netflix seeking to disperse decision-making. Though used as a distinction from its media

[45] Tingley et al., "Decision Making at Netflix."

[46] Christian, "The A/B Test."

[47] Theodore M. Porter, *Trust in Numbers*, 8.

[48] Tingley et al., "Decision Making at Netflix."

competitors and dependent on a complex infrastructure that necessitates the hiring of highly skilled personnel, A/B testing more accurately allows Netflix to adopt the industry's trends toward de-skilling and de-specialization. In a lecture at Stanford University's 2017 Human-Computer Interaction Seminar, Management Science and Engineering professor Ramesh Johari explains how the "portable" nature of A/B test results allow them to travel with minimal friction across departments in an organization, who are then able to adjust tolerances and extract the information needed only by that department without coordination with the originators of the experiment.[49] Ramesh's conclusion slide celebrates how "innovation in information and communication technology has democratized the scientific method."[50] Michael Smith and Rahul Telang explain how the portability of quantitative data like that produced by A/B tests helps companies avoid "data silos" which isolate information and fail to recognize "data are most useful when linked across datasets and seen as a whole."[51] For tech companies like Netflix, who extrapolate data science principles into social and creative principles, "datasets" can mean both technical and human agents.

Netflix's fascination with A/B testing as a management principle has ample institutional support. Both Microsoft and Google offer high-profile support to the methodology that goes beyond claims to validity or empirical benefit to productivity and extend into cultural and political. For example, Microsoft advocates implementing and scaling A/B testing as a central focus of any company's long-term strategies according their "Walk, Crawl, Run, Fly" business

[49] Ramesh Johari, "Peeking at A/B Tests: Why it Matters and What to Do About It," (lecture, Stanford, CA, Stanford University, March 10, 2017).

[50] Johari, "Peeking at A/B Tests."

[51] Michael D. Smith and Rahul Telang, *Streaming, Sharing, Stealing: Big Data and the Future of Entertainment*, Business Book Summary (Cambridge, MA: MIT Press, 2016), 163–64.

model. “To experience the full benefit of A/B testing,” says authors Fabijan, et al, on the Microsoft Experimentation Platform blog, “organizations need to evolve both technically and culturally, and this needs to happen in an iterative way.”[52] Appropriating ideas from Jim Collin’s best-selling management book *Good to Great* (2001), Microsoft makes A/B testing an embodiment of a transparent, egalitarian decision-making process that flattens corporate and educational hierarchies and hedges against the influence of ego. Every idea is liable to serve as a variant in an A/B test that will settle its value. Microsoft’s ideal system establishes a “flywheel,” like those found on spin bikes, that uses momentum from previous A/B experiments to support further implementation of A/B testing, all of which will support more testing-informed decisions, require more infrastructure to measure the value added to decision-making processes by the test results, and ultimately lower the cost of testing overall. Netflix’s adoption of this system — based on the idea that there is never enough testing, that every decision should be tested, that all data produced in testing can and should be used to improve future decision-making, and that the company should continually invest in and develop the technologies involved in testing — align the company with the “bigger is better” mentality of other tech companies seeking what Kate Crawford calls “compute maximalism.”[53] This articulation of an A/B testing flywheel also gestures towards Netflix’s (and other tech companies’) moralization of data analytics. The “collect-it-all” and use it as fodder to improve the existing systems ideology makes it seem “wasteful to not collect data wherever possible,” and not simply economically short-sighted.[54]

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[52] Aleksander Fabijan et al., “It Takes a Flywheel to Fly: Kickstarting and Keeping the A/B Testing Momentum,” *Microsoft Research*, December 28, 2020. https://www.microsoft.com/en-us/research/group/experimentation-platform-exp/articles/it-takes-a-flywheel-to-fly-kickstarting-and-keeping-the-a-b-testing-momentum/.

[53] Kate Crawford, *The Atlas of AI: Power, Politics, and the Planetary Costs of Artificial Intelligence* (New Haven, CT: Yale University Press, 2021), 43.

[54] Crawford, *The Atlas of AI,* 220.

Even as Netflix champions A/B testing, Google remains the method's most influential advocate. In response to Google's vocal enthusiasm for the methodology, *Wired* reporter Brain Christian suggests the relationship between "the scientific rigor of Google's A/B ethos" and Silicon Valley's business logics; First, the method (ostensibly) replaces choice with testing. For instance, instead of meeting to decide which website design scheme is best, a company needs only to test them all at the same time as variants and "let the customers sort it out."[55] Second, the method subverts traditional corporate hierarchies since "data makes the call" instead of highly paid personnel. Christian connects the value of this consequence to Silicon Valley's valorization of outsider underdogs who, against the odds and bucking the advice of traditional experts, went on to success. "Tech circles are rife with stories of the clueless boss who almost killed a project because of a "mere opinion," Christian explains, detailing how a Greg Linden, a developer at Amazon, persevered with an "impulse buy" recommendation feature because A/B testing proved it was a promising idea. Christian's description of the internal dynamics at Amazon suggests a lot about the mythical power of empiricism to flatten hierarchies and support an imagined meritocracy of ideas at even the highest levels of the world's biggest corporations. Linden acknowledges that in most cases, disagreeing so fervently with a Senior Vice President would be a dicey professional move, but as Christian writes, "once [Linden had] done an objective test, putting the idea in front of real customers, the higher-ups had to bend. Amazon's culture wouldn't allow otherwise."[56] Third, Christian identifies a tendency within A/B testing logic towards granularity and conservatism. Whereas prior eras of business were defined by avoiding big, costly mistakes, the data-informed business willingly limits its vision, eschewing radical

[55] Christian, "The A/B Test."

[56] Ibid.

ideas in favor of smaller innovations. For all its supposed advantages, then, A/B testing does little to address the stereotypical critique of top-down decision-making: its stubborn conservatism, and its sluggishness. Companies instead "want to break every idea up into smaller pieces, with each piece tested and then gradually, tentatively, phased into the traffic." The method allows for more decisions to be made by more people, but within a circumscribed area; the biggest decisions are still made by the biggest people. And instead of striving for broad agility in the marketplace, it positively reframes incremental progress as cousin to the necessarily slow (because it is so thorough) gains of experimental science.

Finally, and most interestingly, Christian argues that the speed of testing and results analysis renders obsolete the value of discerning a "lesson" from the test itself, since the result is seemingly the only thing that matters. Companies and engineers alike demand real-time results that can be applied immediately and continually. This practice, which focuses entirely on the actionable and the practical, even undermines the value of accrued expertise. "The difference with live testing," Christian writes, "is not just that there is no time to learn and apply lessons. It's more radical than that. There are no clear lessons to lean, no rules to extract."[57] Ramesh Johari appears to validate this reading when advising analytics companies to discourage client companies from "peeking" too quickly at results of ongoing A/B tests. This practice can make "an eventually inconclusive result [look] "significant" along the way" and dramatically raise the likelihood of false positives and thus negatively influence decisions.[58] While Netflix touts the hyper-speed of its analytics, the company seems to differ in its appreciation for reflection and philosophical understandings of its tests, as will be described below. This fact might be attributed

[57] Ibid.

[58] Johari, "Peeking at A/B Tests."

to the differences in the company's products and Netflix's beliefs about creativity mass media production.

Google's articulation of A/B testing as a model for the ideal company has ramifications within the entertainment industry context that it does not in the search engine industry. Netflix's relentless testing processes and its broader application of scientific methods to media creation should be seen for what it is — an industrial strategy motivated only partly by a desire for empiricism and real knowledge, and partly by economic incentives. It is not a coincidence that Netflix science quantitatively supports Netflix's business objectives and management philosophies because, in fact, they are mutually constitutive. The economic convenience of data analytics and other forms of quantitative research in Hollywood does not necessarily undermine the validity of these methods, but often these persistent ties to profits and emerging corporate bureaucratic structures are downplayed in favor of the methods' and companies' seductive truth claims.

Netflix science fuses the interests of management science with computer science in the service of a few key business objectives. First, Netflix science supports the company's user-centric marketing goals through claims that analytics empowers users by objectively measuring their tastes and behaviors; second, Netflix science helps the company strengthen its position in Hollywood's competitive landscape by inventing metrics for measuring and, ultimately, discrediting traditional modes of creative production. Finally, and more subtly, Netflix science promotes Netflix's artistic reputation by creating an association between the complexity of its technical processes with a sensitivity toward the complexities of story, emotion, and inspiration, promoting media-making as an engineering enterprise.

Netflix's corporate objectives are driven by its competitive status within the streaming video marketplace, and this marketplace's status in Hollywood more broadly, even as the company struggles to maintain supremacy in the streaming video marketplace against competitors Hulu (Disney, Comcast), Disney+, Peacock (Comcast), HBO Max (Warner Bros. Discovery), and not to mention the tech giants' Amazon Prime Video and Apple TV+.[59] The company is unique for *not* being an asset of a multinational conglomerate, and its goals and evaluative criteria are consequently more focused than those of its competitors, whose value is calculated in the context of broader business models. Amanda D. Lotz explains that Netflix is a "pure play focused on subscriber metrics, while corporate compliments might be considered successful based on entirely other metrics," including value for promoting online shopping (Amazon) or the purchase of electronic devices that support the services (Apple).[60] Lotz thus makes a connection between business models and the development and legitimation of metrics — the model determines both the role of metrics (How meaningful are they, and in what contexts?; How are they used?; What conclusions can be drawn from them?) and the type of metrics suitable for measuring success. These questions do not have straightforward answers, but rather companies like Netflix are forced to make values-based and market-based decisions about what constitutes a useful, accurate metric based on its industrial position.

A/B testing should be seen as symptomatic not simply of advancement in technologies but in the increasing emphasis on accountability within corporate structures. While Netflix frames its enthusiasm for testing as a management strategy that radically incorporates failure into

[59] Dade Hayes, "Prime Video Replaces Netflix as No. 1 Streaming Service in U.S., According to Longtime Industry Tracker Parks Associates; Peacock Cracks Top 10," *Deadline*, December 2, 2022.

[60] Amanda D. Lotz, *Netflix and Streaming Video: The Business of Subscriber-Funded Video on Demand* (Cambridge, UK; Polity Press, 2022), 12.

its plans, akin to Mark Zuckerberg's "move fast and break things" mantra[61], the A/B testing model finds traction in Hollywood because it allows easier coordination and accountability across divisions. Kate Crawford writes of the industry-wide trend toward analytics-based evaluation metrics, arguing that "Work of all stripes has had to significantly adapt itself in order to be interpretable and understood by software-based systems," which increasingly form the basis for decision-making by management personnel.[62] Hollywood's accountability movement, like in other industries, relies more and more on data, at the expense of trust in expert judgement or the hunches of Hollywood's Golden-Era executives like Darryl Zanuck, Jack Warner, and others. In an interview for a piece on the changing culture of Hollywood executives, producer David Ladd (formerly at MGM/United Artists) says, "Everything's compartmentalized…The marketing, legal and production departments are all different entities."[63] The managerial demands of this highly stratified corporate culture include distributing decision-making to various departmental "entities," but in a way that can be routinized and evaluated systematically by middle- and upper-management figures. "The days of the Louis B. Mayer-style autocrat are over," says Ladd. In its place, Netflix offers a system where making confident decisions requires "building a data-driven case" using tools like A/B testing that seem nearly purpose-built for enabling this decision-making style and the accountability movement.[64]

[61] Hemant Taneja, "The Era of 'Move Fast and Break Things' Is Over," *Harvard Business Review*, January 22, 2019.

[62] Crawford, *The Atlas of AI*, 58.

[63] Richard Natale, "The Moguls of Minutiae," *Los Angeles Times*, December 13, 1998.

[64] Natale, "The Moguls of Minutiae."

From Match Cutting to Batch Cutting

One of the ways Netflix science supports the company's subscriber-supported business model and helps it gain a competitive foothold in Hollywood is by, self-servingly, creating and justifying a desire for the scientific enhancement of traditional modes of artistry and establishing metrics for its own success. Netflix's aspirations of advancing machine-assisted creative production appeal to objectivity as a malleable concept and adapt it to complement its corporate strategies. Often, this adaptation is accomplished by blurring the distinction between creative and technical tasks and naturalizing Netflix's engineering efforts as simply more specialized forms of artistic problem-solving, effectively obscuring the implicit labor arguments and other ambiguities that arise in applying and scaling these methods.

Consider a research article from 2022, "Match Cutting: Finding Cuts with Smooth Visual Transitions Using Machine Learning," by Boris Chen et al.[65] The article provides an overview of the company's efforts to automate the process of creating match cuts through machine vision that can identify, sort, and rank various types of shots' appropriateness for the technique. The authors seem to recognize the need to provide context to this goal, but instead of answering first questions like "Who would need this and why?" (which is explained further down), they begin more broadly, taking the rhetorical position of an introductory film instructor. The platform's international breakout hit *Squid Game* (2021) is used to explain the fundamentals of match cuts and their thematic and story functions:

> The players voted to leave the game after red-light green-light, and are back in the real world. After a rough night, Gi Hung finds another calling card and considers returning to

[65] Boris Chen et al., "Match Cutting at Netflix: Finding Cuts with Smooth Visual Transitions," *Netflix Tech Blog*, February 19, 2023, https://netflixtechblog.com/match-cutting-at-netflix-finding-cuts-with-smooth-visual-transitions-31c3fc14ae59.

> the game. As he waits for the van, a series of powerful match cuts begins, showing the other characters doing the exact same thing. We never see their stories, but because of the way it was edited, we instinctively understand that they made the same decision. This creates an emotional bond between these characters and ties them together.[66]

The educational and promotional rhetorics merge in this address, which presumes a reader unfamiliar with film technique and analysis while also holding up the company's own products as worthy objects of study that have been meticulously crafted using the kinds of advanced, creative thinking soon-to-be divulged. The meaning of the *Squid Games* match cut sequence is compared to that of other canonical 'Intro to Film' mainstays like *2001: A Space Odyssey* (1968), *Indiana Jones and the Last Crusade* (1989), and *Lawrence of Arabia* (1962) (from the blown-out match to a sunset, which the authors concede is more ambiguous as to meaning and why it "works"). These selections underline the didacticism of the piece and work to establish the authors not simply as engineering and mathematics experts, but as knowledgeable on film art too.

This is a revealing way to proceed into a technical discussion of the company's various machine vision experiments because 1) it aims to establish more commonality than is fair between the artistic concerns of above-the-line creative personnel and the technical concerns of Netflix's engineering team; and 2) it attempts to frame the technical as part of a lineage of methods for engaging in the same kind of artistic play and complex meaning-making as the processes behind the example sequences. Even if that is the authors' purpose — to present Netflix's methodologies as simply more sophisticated means of exploring effective cinematic techniques — they leave unresolved a glaring disconnect between *these* kinds of shots from

[66] Chen et al., "Match Cutting at Netflix."

classic films and the products this match cut initiative is *truly* intended to improve: promotional materials. In this respect, their Film 101 didacticism is reprehensible since it deliberately misleads us from understanding the real goals and implications of these automation projects. In the "classic film" examples, the match cuts are certainly scripted and planned for during shooting. Netflix's absurd assertion that "match cutting is considered one of the most difficult video editing techniques, because finding a pair of shots that match can take days, if not weeks," is applicable primarily to editors in a specific (i.e. Netflix's) production context, who are assembling promotional materials like trailers out of materials with likely little to no communication with the creators themselves.[67] Netflix presents the problem of discovery as the standard plight of editors creating match cuts without offering this full industrial context; but editor Anne V. Coates did not wade through footage from the set of *Lawrence of Arabia* and discover the famous match-to-sunset cut serendipitously. By confusing the auteur-driven, scripted, version of match cutting with a form of match cutting carried out primarily by alienated editors assembling promotional materials from disparate sources, Netflix suggests the latter requires a form of artistry and creativity inherent to the former. This claim sets the stage for the belief that the technologies used to enhance match cutting for promotional content are simply advanced ways of approaching the same problem faced by the screenwriter, director, or cinematographer in executing a planned match cut. Netflix does not seem motivated to acknowledge the tasks are distinct, even while doing so does not necessarily devalue the skills required to do either.

Followed to its logical endpoints, Netflix's disingenuous blurring of the distinction between the planned match cut and the machine-assisted serendipitous match cut also introduces

[67] Chen et al., "Match Cutting at Netflix."

the simplistic and unfair comparison between the observational capabilities of human editors versus machine vision technologies. Perhaps this is what Netflix wants, as it highlights the company's competitive advantage over other Hollywood players: its engineering department and technology-enhanced approach to media production and management. In typical quantification-centric language, the authors argue: "A typical two hour movie might have around 2,000 shots, which means there are roughly 2 million pairs of shots to compare. It quickly becomes impossible to do this many comparisons manually, especially when trying to find match cuts across a 10 episode series, or multiple seasons of a show, or across multiple different shows. What's needed in the art of match cutting is tools to help editors find shots that match well together, which is what we've started building."[68] Taking this article at face value puts us in an inaccurate and unfair relation to film and television producers and their histories; Are we to look back at Anne V. Coates with pity? After all, *Lawrence of Arabia* is nearly twice the length of a "typical two hour movie." *If only she had Netflix's great minds and resources, who knows what the film might have been!*

In their framing as irrefutably disruptive technologies – a claim enhanced by the company's hard numbers on shot pairs (2 million+), total shot candidates, etc. – Netflix's match cutting tools are offered as interventions not only at the practical level, but also at the moral level, since they appear to alleviate the labor burden on human editors. Writing about the history of objectivity and its relationship to machines, Lorraine Daston and Peter Galison explain how this kind labor-saving refrain has historically served to moralize machine labor and thus facilitate the continued incorporation of machines into scientific and industrial settings:

[68] Chen et al., "Match Cutting at Netflix."

> While much is and has been made of those distinctive traits — emotional, intellectual, and moral [and creative, in this case] — that distinguish humans from machines, it was a nineteenth century commonplace that machines were paragons of certain human virtues. Chief among these virtues were those associated with work: patient, indefatigable, ever alert machines would relieve human workers whose attention wandered, whose pace slackened, whose hand trembled. Scientists praised automatic recording devices and instruments in much the same terms…It was not simply that these devices saved the labor of human observers [for Netflix, editors]; they surpassed human observers in the laboring virtues: they produced not just more observations, but better observations." [69]

The underlying labor argument in Netflix's idealization of technology speaks to the broader way its engineering initiatives further justify the automation of creative labor and production, which is an industry-wide trend with influence beyond the entertainment context. More shamefully, the labor argument at the root of Netflix's computational editing implies problems with the production process should be located in the company's human editors, who are insufficient to the "impossible" task of manually sorting through footage assigned to them in a timetable Netflix finds satisfactory.

Running the Numbers: Audience Measurement and Recommendation

One of the key insights proven by the history of quantitative research in Hollywood is that there is always pressure for the industry's major players to settle on a standard for metrics (read: audience measurement metrics). Moreover, this pressure exerts itself on Hollywood's various parties for reasons beyond scientific rationality, a desire for more objective decision-making, or

[69] Lorraine Daston and Peter Galison, "The Image of Objectivity," *Representations*, no. 40 (1992): 83.

the sheer *rightness* of technologically sophisticated data collection systems; the pressure instead arises from capitalism's preference for standardization, which creates more predictable conditions for evaluation, exchange, and competition. As Karen Buzzard explains, in the entertainment industry, metrics function as a form of "currency," which in the context of the media ratings industry refers both to "what method is currently in use by the dominant ratings services," and "the use of ratings as a form of currency or money by which to buy and sell an otherwise invisible product."[70] Metrics therefore have power materially (as the basis for the literal exchange of money) and as forces of industrial hegemony, where their symbolic, "invisible" value exists only with the support of certain institutional agents. The power of Netflix's metrics is not simply their practical ability to collect precise data about viewer behaviors, but also their ideological power to reveal complexities of audience behavior and thus justify Netflix's push toward intensified personalization.

The stakes of this connection between the material and symbolic value of metrics is more than theory, however. The history of the ratings industry is partly a legal history in which competing ratings companies manipulate media regulatory bodies, courtrooms, and the U.S. Congress to influence the value of audience metrics. During the 1950s television boom, the crowded TV ratings industry consisted of four major companies, each with its own signature audience measurement method: American Research Bureau (diary method), Pulse (personal interview method), Nielsen, Inc. (mail-in household meter method), and Hooper (telephone coincidental method); in addition, other, smaller competitors were emerging offering their own competing method: Videotex (a variation on diary method), Sindlinger (hour-long telephone interviews), Radox (electronic meter method), and Trended (telephone coincidental method and

[70] Buzzard, *Tracking the Audience*, 1.

meter method).[71] In 1963, the confusion between these systems and frustration with their incompatibilities motivated Representative Oren Harris of Arkansas to call a House committee meeting "on the methodology, accuracy, and use of ratings in broadcasting."[72] This hearing is one example of how concepts of objectivity and scientific rationality can be brought into such industrial disputes strategically, as a way for companies or legislative entities to thin the competitive herd according to shifting political and industrial motivations. Similarly, in the 1940s, the radio and magazine industries saw an opportunity to take their competitive strategies outside the courtroom and into discourses of empirical research; these industries made concerted efforts to dispute television ratings-related research primarily because it drew attention to the surging popularity of the medium and not for any questions about metrics' validity.[73]

Netflix's unique status as a pure play enterprise not part of a larger media conglomerate allows the company more freedom in framing the influences of its analytics, even as they remain driven by economic and industrial motivations. Netflix predominantly refers to the values of scientific communities when elaborating the underlying principles of its analytics tools, whereas historically, media companies developed their systems and metrics around the desires and business philosophies of the advertising community. For example, as one of the early figures of network radio audience measurement, Archibald M. Crossley developed a method for testing the value of radio advertisements: the telephone recall method. A variation on quota sampling survey techniques, the process involved calling people in a given market on the telephone the day after a sponsored show aired, in order to record whether the listener is able to recall the brand name or

[71] Buzzard, *Tracking the Audience,* 33.

[72] Buzzard, 33.

[73] Yankelovitch quoted in Buzzard, *Tracking the Audience,* 28.

other details pertinent to the advertising client. This system privileged advertisers' concept of *impact* (represented by the correct identification of the sponsor) over alternative, more encompassing numbers related to reach or demographics. This was, according to advertisers, "the most useful index to advertising effectiveness." Today's metrics have likewise emerged in conjunction with shifting industrial power structures, and in accordance with media industry's economic conditions. While Netflix's metrics are designed to serve the company's subscriber-focused profit strategy, its methods bear the mark of its Silicon Valley peers' highly lucrative online advertising initiatives. In their early days, these online advertising initiatives served as proof-of-concept for a kind of depth of data and "transparency" that motivated advertisers in other industries to start demanding more of traditional ratings systems.[74]

Contemporary audience tracking systems are characterized in trade publications and public discourse either as untrustworthy since they lack transparency (unlike, for example, box office numbers)[75], as invasive and signifying the end of personal privacy[76], or morally, as extensions of a culture that glorifies optimizing viewership at any cost at the personal and industrial scales.[77] These social and ideological critiques of analytics relate the technological designs and functions of these systems to their (typically negative) impacts on daily life. Even as they did not have the same reliance on computational systems, pre-digital audience tracking metrics used designs that likewise reflected assumptions about audiences' social environments. The diary method, pioneered by James Seiler, founder of the ratings company American Research Bureau, involved

[74] Buzzard, *Tracking the Audience,* 9.

[75] Tom Brueggemann, "Here's Why Netflix and Amazon Don't Report Box Office, and Probably Never Will," *IndieWire*, November 23, 2019.

[76] Sarah Lamdan, "The Quiet Invasion of 'Big Information,'" *Wired*, November 9, 2022.

[77] Casey Newton, "What Instagram Really Learned from Hiding like Counts," *The Verge*, May 27, 2021.

mailing questionnaires to households across the U.S. for self-reporting radio listening numbers. As Buzzard points out, the system's practical affordances (as an early source of reliable demographic data; as a cheap way of sampling local markets where meter-based methods would be too costly) emerged out of the fundamental orientation of the system toward the nuclear family, which "served as the target of oceans of merchandise for manufacturers and advertisers choosing the household as the measurement unit."[78]

Additionally, the power of ratings and their purveyors to influence media production became the center of critiques against television's artistic and moral mettle in the immediate aftermath of the 1950s-60s quiz show scandals; critics argued that prioritizing ratings over all other concerns led network executives to outright rig or otherwise disregard fairness in the moderation of game shows; "The entire industry, critics charged, was hopelessly cowed by sets of cold, unreliable, and totally meaningless numbers," Buzzard writes. "Ratings were condemned on two counts: they were too unscientific and exerted too pernicious an influence on TV."[79] The moral dubiousness of content thus bled into a projection of moral value onto ratings metrics and research itself.

Netflix's analytics systems, including its audience measurement tools, metrics, and applications through personalized features emphasize and concretize the company's economic strategies; while the company claims its quantitative methods simply capture and describe viewer behaviors, they in fact reflect the kinds of audiences and behaviors the company most values. Amanda D. Lotz's emphatic point about Netflix's unique, singular goal — subscribers, and not necessarily specific viewership goals — merits repeating here, as it clearly structures what the

[78] Buzzard, *Tracking the Audience*, 36.

[79] Buzzard, 44.

company considers useful and innovative in its own system. Netflix's "empire-building fantasies about completeness and mastering whole stores of information and categories"[80] are on full display in its research articles, which provide overviews of the many ways its audience tracking filters back into its service, including: rankings of titles in the user interface, organization of categories and rows of titles, search query responses, personalized artwork (both for artists to choose and for viewers to see), and communication strategies outside the platform (social media, email).[81]

Netflix is constantly moralizing its quantification methods, even when simply delineating some of its processes. These appeals draw impact from contemporary understandings of digital technologies as exemplifying a mechanical objectivity that limits the role of human mediation and connects a disciplined, rigid application of process with objective truths. Netflix consequently positions itself as diligently impersonal in its desire to calibrate its metrics to the objective phenomena of audience behavior and preferences. In this ideological environment, the company's library model — in which "any title is just part of the value that compels viewer subscription"[82] — represents a creative advantage for its ability to generate massive amounts of data that can train the company to improve its products like such data does for its machine learning technologies. "By inspecting past asset performance from thousands of titles that have already been launched on Netflix," a research blog post explains, "we achieve a beautiful

[80] Frey, *Netflix Recommends*, 20.

[81] Justin Basilico, "Recent Trends in Personalization at Netflix," (talk, Netflix Expo, RecSys 2020 Virtual Conference, September 24, 2020), https://www.slideshare.net/justinbasilico/recent-trends-in-personalization-at-netflix.

[82] Lotz, *Netflix and Streaming Video*, 58.

intersection of art and science."[83] Even here, the authors are careful to remind readers that interpreting audience response can become "subjective and vulnerable to confirmation bias."[84]

The notion that its analytics are a positive force for consumers (and creativity) softens disclosures from Netflix that reveal how its systems function as all-encompassing consumer surveillance technologies. Tracking all activity on its platform, from viewing time to cursor paths, help the company keep the service running smoothly, and therefore to *not* track everything would be to concede lackluster performance. Netflix' engineers describe: "Once an issue is identified with either detection or prediction models, the next phase is to find the root cause. The first step in this process is to reproduce the issue in isolation. However, large-scale recommender systems are very dynamic and we may not be able to reproduce the issue by simply re-running the code…Therefore to reproduce the issue we need to set up proper logging in advance."[85] The engineering demand to establish logging indirectly supports the notion that the best service comes from high degrees of consumer surveillance. This logic has obvious and dangerous implications for the future of online privacy. Moreover, Netflix's rationale for increasing surveillance appears sound not simply because we are accustomed to trading privacy for affordances in our digital technologies[86], but because tech companies like Netflix have

[83] Grace Tang et al., "Discovering Creative Insights in Promotional Artwork," *Netflix Tech Blog*, January 30, 2023, https://netflixtechblog.com/discovering-creative-insights-in-promotional-artwork-295e4d788db5.

[84] Tang et al., "Discovering Creative Insights."

[85] Ehsan Saberian and Justin Basilico, "RecSysOps: Best Practices for Operating a Large-Scale Recommender System," *Netflix Tech Blog,* September 30, 2022, https://netflixtechblog.medium.com/recsysops-best-practices-for-operating-a-large-scale-recommender-system-95bbe195a841.

[86] Mark Andrejevic, *iSpy: Surveillance and Power in the Interactive Era* (Lawrence, KS: University Press of Kansas, 2007).

distributed representations of computer science so broadly and effectively that the needs of engineers can be understood, appreciated, and ultimately prioritized above our own.

Netflix's vocal determination to personalize its user experience is one of the key drivers of the company's moralization of quantitative methods. This is the case even as scholars have challenged the company's claims that its personalization systems are as critical to the system as the company indicates. While Netflix says "Everything is a recommendation!" in a corporate slideshow presented in 2020[87], Mattias Frey argues that the overriding industrial function of recommendation systems ("managing risk in the rational overproduction of media, the need to direct consumer attention"[88]) is often overshadowed by these cultural fantasies projected on them. Netflix is not only aware of this pattern, but exploits it to its advantage by turning all information about its systems into promotional material. According to Frey, the industry myth of analytics emerges from "that old new-media conviction that data do it better and algorithms can more ably understand tastes because they remain unswayed by cultural biases, groupthink and herding, illusory correlations and hot-hand fallacies, superstition and conjecture: in short, all of the flaws of human interpretation created by social acculturation."[89] Frey argues that some of Netflix's features rely less on data analytics than on pre-Netflix forms of cultural recommendation, including print criticism and lists, as well as word-of-mouth.[90] His most poignant criticism, however, is that expressing concern about the potential dehumanizing effect of quantification in entertainment media implicitly gives these systems more power than they

[87] Basilico, "Recent Trends in Personalization at Netflix."

[88] Frey, *Netflix Recommends*, 28.

[89] Frey, 88.

[90] Frey, 66.

actually have.[91] This account tries to avoid this trap by identifying the intrinsic values of the company's technological systems without delving too far into assessing their efficacy beyond the realm of marketing and industrial rhetoric.

The most overt intervention made by Netflix into traditional Hollywood workflows comes in its Studio Engineering initiatives. Studio Engineering seeks to bring nearly all questions about production methods into the realm of engineering and software. Here, data analytics functions as currency in exclusively business-to-business relationships, where Netflix builds various applications aimed at coordinating, streamlining and automating the "Pitch to Play" process, which the company defines as: "Forecast, Program, Pitch Evaluation, Deal Negotiation, Rights and Music, Production, Post Production, Score Acquisition, Metadata, Promotional Media, Media Processing, Encoding, Localization, QC, Publicity and Promotion."[92] Such approaches to production are highly influential because the company has both achieved relative success while also developing an emerging industrial kinship to studios. Of course, Netflix has a tech-world pedigree and gloss, but in reality, the company is more media production-oriented than many of its competitors in the platform economy. "Unlike its Silicon Valley counterparts," write entertainment reporters Cynthia Littleton and Elaine Low, "Netflix has a business that is entirely centered on content and subscriptions. In some ways, that aligns Netflix with its traditional-studio peers more than, say, Amazon or Apple, two companies whose apparent seriousness about being Hollywood players is often undermined by their interests elsewhere," referring to the use of media properties to sell devices or other services.[93] Where Netflix's tech company lineage

[91] Frey, 99–100.

[92] CJ Barker, "Netflix Entertainment @ Scale," (talk, Netflix Engineering networking event, Los Angeles, CA, February 6, 2020).

[93] Cynthia Littleton and Elaine Low, "Adapt or Die: Why 2020 will be All about Entertainment's New Streaming Battleground," *Variety,* December 17, 2019.

persists is in its insistence on scale as a primary goal for media production. “Scale”, “joy”, and scaling joy appear in nearly every one of Netflix’s conference presentations or interviews. Quantification of the “Pitch to Play” process is essential for achieving this scale; in a 2018 write-up called “Data Science and the Art of Producing Entertainment at Netflix,” the authors write, “Each production is a mountain of operational and logistical challenges that consumes and produces tremendous amounts of data. At Netflix’s scale, this is further amplified to levels seldom encountered before in the history of entertainment. This has created opportunities to organize, analyze, and model this data that are equally singular.”[94]

This business-to-business side of Netflix’s operations not only relies on a more straightforward reliance on quantification’s association with science, it also provides the impetus for the industry to establish some kind of universally shared logic about the proper application of data analytics; historically, objectivity and quantification serve as “adaptations to the suspicions of powerful outsiders,” according to Theodore Porter.[95] Netflix has less reason to concern itself with suspicion from its studio competitors — if appeals to scientific rationality in this discourse fall flat, at least they promote the approved marketing goals — but it is in this often-overlooked, business-to-business side of Netflix’s operations where the company’s claims have concrete stakes: selling the validity and benefits of its web-based applications and production software solutions to stakeholders. In these pitches, Netflix makes clear how its digital systems compare to traditional modes of production that rely on trust in expert judgement and analog documentation; multiple promotional videos exploring the Studio Engineering department emphasize, in obviously coordinated language given the repetition, that “[Netflix’s engineering

[94] Ritwik Kumar et al., “Data Science and the Art of Producing Entertainment at Netflix” *Netflix Tech Blog*, March 26, 2018, https://netflixtechblog.com/studio-production-data-science-646ee2cc21a1.

[95] Theodore M. Porter, *Trust in Numbers*, 89.

teams] are dealing with a hundred-year-old industry that is encumbered with paper and manual processes across the board, everything from insurance, call sheets…all the way down to delivering those on fax machines."[96] The idea that scaling production is the commonsensical goal of all production entities, often to a global market, is the dominant logic driving Netflix's normalizing of data analytics -- and Netflix insists that media production becomes impossible to scale efficiently without (its) data systems and services.

I cannot argue that Hollywood should not be concerned with such production scaling (or never has been in some form), but it is important to continually challenge the applicability, desirability, and ethics of *this kind* of scaling for media work. Netflix is part of a generation of tech start-ups from the 2000s- whose attempts to expand their markets quickly and radically, at any cost, constitute a historically distinct method of scaling business based on goals we should not unconsciously assume serve Hollywood production, audience demands, creative labor, etc. Investor and venture capitalist Reid Hoffman has famously dubbed the scaling methods of tech companies like Amazon, Airbnb, and Uber as "blitzscaling," defined in his 2018 book (co-authored with Chris Yeh) as "a set of techniques for scaling up at a dizzying pace that blows competitors out of the water" and escalates not from "zero to one, but from one to one billion."[97] Hoffman underlines the role of digital technologies in this specific model of scaling in an interview with *Harvard Business Review*, where he says "software has a natural affinity with blitzscaling" because it hastens logistics, reduces friction, and improves feedback loops.[98] That

[96] Barker, "Netflix Entertainment @ Scale."

[97] Reid Hoffman and Chris Yeh, *Blitzscaling: The Lightning-Fast Path to Building Massively Valuable Companies* (New York: Crown Currency, 2018); It is worth noting that "zero to one" is a reference to venture capitalist Peter Thiel's bestselling business book *Zero to One: Notes on Startups, or How to Build the Future* (New York: Crown Currency, 2014).

[98] Tim Sullivan, "Blitzscaling," *Harvard Business Review*, April 1, 2016.

the ideas animating blitzscaling derive from a computer science course taught at Stanford University by Hoffman, Yeh, and entrepreneurs John Lilly and Allen Blue emphasizes the difficulty of distinguishing fashionable business-speak from technological logics.

But Netflix's technology-enabled, "blitz"-style scaling can come at great cost, for instance, to its own (and Hollywood's) attempts to diversify its leadership, talent, and workforce. In the same interview, Hoffman explains how successful companies "hack" organizational hiring practices to facilitate rapid scaling:

> In hiring, for instance, [companies wanting to blitzscale] may need to get as many warm bodies through the door as possible, as quickly as [they] can – while hiring quality employees and maintaining the company culture. How do you do that? Different companies use different hacks. As part of blitzscaling at Uber, managers would ask a newly hired engineer, "Who are the three best engineers you've worked with in your previous job?" And they'd send those engineers offer letters. No interview. No reference checking. Just an offer letter. They've had to scale their engineering fast, and that's a key technique that they've developed.[99]

Such informal, network-based hiring methods are precisely the practices identified by labor leaders, social justice organizations, psychologists, sociologists, and other special interest groups as obstructing diversity, equity and inclusion in the workplace[100]; damningly, they also reinscribe the traditions of prejudice and affinity bias targeted in the annual Hollywood Diversity Report published by UCLA's Entertainment & Media Research Initiative, *which Netflix prominently*

[99] Sullivan, "Blitzscaling."

[100] Rebecca Sun, "Racial and Gender Diversity in Theatrical Film Regresses to 2019 Levels (Study)," *The Hollywood Reporter*, March 30, 2023.

sponsors.[101] When interviewer Marc Olivier LeBlanc presses Hoffman on his hiring anecdote, commenting that it "reminds [LeBlanc] of Google's decision to hire only people with very high GPAs from elite universities" and ignores "many smart people you're not allowed to hire," Hoffman explains companies like Google believe (correctly) that they "need a simple heuristic so that [they] can focus on what really matter," and this ultimately "helped [Google] create and maintain a coherent culture as the company scaled."[102] This fetishization of simplicity, reduction of variables, elimination of inefficiencies – however companies choose to label and rationalize these methods and perspectives – are essential elements in Netflix's its peers' business models, decision-making heuristics, corporate philosophies, and rationales for the development of tools like A/B testing, computational editing, and other tech research projects. As Hoffman's example illustrates, scaling has a tendency to amplify issues in production processes, so choosing to focus on scale at the expense of everything else is not simply a statistical or economic decision – it has social and political consequences. Even if Netflix executives would take issue with the discriminatory hiring practices described above, the logic of scaling can warp perspectives on diversity, equity and inclusion in other ways – for instance, by conflating the commercial goals of scaling (to create/reach every market possible) with the genuine desire to celebrate global cultures, traditions, and tastes. At the very least, Netflix's emphasis on its technology-enabled scaling projects should cast doubt on its prioritization of and ability to support its efforts to address a lack of representation within its ranks and in media industry.

[101] Ana-Christina Ramon, Michael Tran, and Darnell Hunt, "Hollywood Diversity Report 2023: Part 1: Film" (Entertainment & Media Research Initiative: University of California, Los Angeles, 2023).

[102] Sullivan, "Blitzscaling."

The Industry of Industry Science

This section looks beyond individual expressions of the culture of empiricism, like that described at Netflix, and tries to understand what cultural, industrial, and ideological connections exist between today's era of technology-driven quantification and Hollywood's earlier efforts to establish and legitimize new metrics, measurement technologies, and empirical logic to its production processes. Karen Buzzard's research on the ratings industry since the analog radio era to the digital present offers invaluable insight into the way scientific (and semi-scientific) methodologies are adopted by entertainment media institutions and translated into commercial applications informing media production. Buzzard's historical perspective sheds light on the way digital technologies and entertainment industry business models shape one another in a reciprocal process; there is not a one-way process in which technologies are purpose-built in response to industrial needs. This section argues that aside from the combined influences of finance and economics in Hollywood business, the industrial and cultural push to rally around specific audience measurement tools and standards represents media industry's strongest connection to quantification and empirical thinking.

Marketing scholars Mark B. Houston and Thorsten Hennig-Thurau's *Entertainment Science: Data Analytics and Practical Theory for Movies, Books, and Music,* from 2019, stands in as a representative and provocative expression of contemporary attitudes towards data analytics within the entertainment industry. The foregrounding of *Entertainment Science* should not be seen as an endorsement of the nearly 1,000-page book's claims, nor as evidence that Hollywood even embraces the kind of thinking outlined in the book; rather, the book presents an ambitious merger of scientific discourses with contemporary industrial discourses, especially in its preference for eclecticism in sampling metaphors and logics from fields as diverse as game

theory, cognitive science, and psychology. The book is also useful for the authors' explicit goal of revising tried-and-true media production theories in light of emerging digital technologies; in addition to targeting "current leaders of entertainment firms who like to have their thinking challenged," the book aims to benefit media scholars by "providing them a coherent and comprehensive picture of scientific insight that has been gathered so far."[103]

Analyzing *Entertainment Science* in conjunction with previous era's audience measurement efforts provides insight into the historical factors shaping current attitudes and applications of scientific methodologies in Hollywood. Beyond Hennig-Thurau and Houston's book, this section also explores contemporary purveyors of data analytics thinking like: Cinemascore, Rentrak, RelishMix, Next Big Sound, Moviepilot, Epagogix, and Vivendi SA's Artist Portal, and entertainment industry blogger Stephen Follows.[104] What emerges from this analysis is a better understanding of the way digital technologies and their ever-shifting affordances and potentialities inform beliefs about what constitutes effective quantitative methods in Hollywood's industrial and, critically, social climate. Today's methods are legitimized as much by social preferences in Hollywood for certain kinds of knowledge and decision-making and values as by rigid, empirical assessment. Additionally, the ascendancy of any given analytics method is not achieved simply by its accuracy, efficiency, or sophistication, but rather by a social-industrial process in which media entities, for various reasons, agree to consider a method valid and/or meaningful.

[103] "Homepage," Entertainment Science: The Book, accessed April 25, 2023, https://www.marketingcenter.de/lmm/entertainment-science/index.html.

[104] Hennig-Thurau and Houston, *Entertainment Science Data Analytics and Practical Theory for Movies, Games, Books, and Music*, chap. 1, Kindle.

The data analytics thinking represented by texts like *Entertainment Science* takes as its primary opponent the "gut instinct." The proponents of this generations' analytics logic offer their tools and methods in a way that contrasts them with the tradition of the personality-driven studio of golden era Hollywood, or that of the New-Hollywood-era (1948-) independent producer who needed to creatively navigate an increasingly complex political and industrial climate to drive a project forward.[105] In Hollywood, there has always been a reverence if not an official implementation of producers or executives "trusting their gut," or, in other words, basing decisions on personal feelings or "hunches" rather than verifiable evidence. The primary justification for this approach has historically been an appreciation for the fickle nature of audiences and trends in the entertainment industry that renders any attempts to systematize risk-management futile. No one better encapsulates this industrial attitude than screenwriter William Goldman in his oft-quoted 1983 memoir *Adventures in Screen Trade,* where he claims "Nobody knows anything…Not one person in the entire motion picture field knows for a certainty what's going to work. Every time out it's a guess and, if you're lucky, an educated one."[106]

But the casual presumption that analytics is more informed by what some might consider evidence than traditional assessment methods is a mistake, as it overlooks both the history of quantitative study in Hollywood and the skills of media producers in developing their abilities to "read" audiences and make creative decisions. Having an understanding of an audience is critical to any form of communication, but in Hollywood, it is an expensive, complicated, and highly coveted form knowledge. While in the academic field of audience studies and among audience

[105] Denise Mann, *Hollywood Independents: The Postwar Talent Takeover* (Minneapolis, MN: University of Minnesota Press, 2008), 10.

[106] William Goldman, *Adventures in the Screen Trade*: *A Personal View of Hollywood and Screenwriting* (New York: Warner Books, 1993).

testing and measurement agencies, learning about an audience takes on a more rigorous, systematic, and even qualitative flavor, for those wanting to work in the entertainment industry, acquiring an understanding of audiences, what they want, and more importantly what they will pay to see, involves refining an intangible "instinct" for such things, informed by one's "gut" sense of the "pulse." Stephen Zafirau has previously explored how cultural producers use their everyday experiences and emotional intelligence to inform "hunches" and improve their ability to predict audience preferences. In Zafirau's account, cultural producers not only make committed efforts to maintain a well-rounded media consumption diet to develop their own tastes, but they also draw from the wisdom of children, who come to culturally symbolize both a form of authenticity and, in more rational terms, the enduring importance of the youth market in Hollywood.[107] Inevitably, when trying to better understand media audiences, cultural producers are required to form an opinion about their relationship to them — whether these audiences are real, imagined, or socially constructed. Are the people who make media part of the audience? Are they separate? Are these positions stable? Each of these conceptions of the producer-audience relationship comes with its own value system that suggests how data analytics, too, require a basis in cultural beliefs about audience behavior — for instance, that audience behavior is complex but follows predictable patterns that can be observed through data. Zafirau explains how even test screenings encourage producers to seek support for decisions beyond the data such tried-and-true methods offer: "In addition to providing valuable statistics on the reaction of audiences to a particular movie, test screenings were said to help executives "feel" an audience. Also, by repeatedly watching movies with test audiences and then comparing how these

[107] Stephen Zafirau, "Audience Knowledge and the Everyday Lives of Cultural Producers in Hollywood," in *Production Studies: Cultural Studies of Media Industries*, ed. Vicki Mayer, Miranda J. Banks, and John T. Caldwell, (New York: Routledge, 2009), 197.

subjective "feelings" of the audience stacked up against real numbers, some executives thought that they could sharpen their "gut" instincts more generally."[108]

Zafirau's account provides insight into the tradition of the "gut instinct" in Hollywood and demonstrates how the practice emerges out of its own critical context. For Houston and Hennig-Thurau, the gut instinct is representative of the old Hollywood because it lacks scientific rigor and accountability (since hunches cannot be translated into figures). But Zafirau describes how the gut instinct "method" *is* based on information available to the practitioner, just not that which can be analyzed by statisticians. The gut instinct has socially-refined, sanctioned methods of improving one's hunches and directing one's application of hunches. Other production studies scholars have unearthed many similar methods of qualitative, semi-formal knowledge production within Hollywood labor cultures that appear irrational to the outside researcher but are in fact based in highly structured logics produced by specific cultural-industrial communities. The use of the gut instinct as the bad object in *Entertainment Science* and other data analytics research points to the current distaste for social, embedded, qualitative forms of knowledge in media industry practice. This ideological shift derives in part from the advancement of tools for analyzing large amounts of data. "Gut-feeling-based decision making is no longer an adequate way to address the challenges of today's entertainment industry (we're not sure it ever was)," write Houston and Hennig-Thurau. They elaborate, "In a competitive digital environment, with so much information being available, managers can no longer justify making important decisions based solely on their personal feelings."[109] The implied connection between technology and

[108] Zafirau, "Audience Knowledge," 199.

[109] Hennig-Thurau and Houston, *Entertainment Science: Data Analytics and Practical Theory for Movies, Games, Books, and Music,* chap. 1, Kindle.

decision-making practices is laid out here; if there are tools that produce more information about a process, it is unjustifiable to not permanently incorporate them into industrial decision-making. The unspoken assumption is that all methods prior to the technology- and mathematics-driven methods were aspiring to (and falling short of) the same standards and ideals of the emerging methods. Karen Buzzard notes a similar Rubicon-crossing moment and its impact on previous forms of knowledge in describing the transition from analog to digital based ratings. Buzzard writes, "The switch to digital technology presented measurement issues that challenged traditional audience measurement data and its body of established knowledge. In many instances, former analog business models and their beliefs were called into question."[110] In media industry, the ascendancy of certain tools requires attendant changes at the epistemological level.

Entertainment Science's worldview is not without consideration for what production studies scholars call the "lived experience" of industry practitioners, or "the ways that life's everyday experiences impact, inform, and influence the practical and creative work of the people they study."[111] The book's promotional imagery features Houston and Hennig-Thurau sitting next to one another in matching director's chairs, one labeled "Data Analytics" and the other "Theory." The book describes these fields in varying terminology ("Practical theory" instead of theory, more commonly) as the two "power sources" of the *Entertainment Science* philosophy. While the authors are very precise in delimiting what counts as a useful quantitative methodology and why, they are less specific about the meaning and application of "practical theory." And even when the book does acknowledge the experiences of practitioners or producers (the target reader), it will often restate traditional wisdom in the beefed-up language of

[110] Buzzard, *Tracking the Audience*, 10.

[111] Vicki Mayer, Miranda J. Banks, and John T. Caldwell, eds., *Production Studies: Cultural Studies of Media Industries* (New York: Routledge, 2009), 9.

(what is considered) high theory and economics; in a chapter advocating a portfolio business model that utilizes the expertise of veteran personnel:

> Usually, producer of entertainment, just like any investor, has certain specific area(s) of expertise — not just expertise in entertainment versus other business, but areas of expertise *within* specific domains in the heterogenous entertainment industry. The producer's expertise in other domains will be less pronounced. Because expertise affects the success potential of any product, investments in products that make maximal use of a producer's expertise will, all else equal, provide higher returns than will investments in projects outside of the producer's domain expertise.[112]

This passage is included to illustrate the way experience is understood and applied within the *Entertainment Science* system, which I consider suggestive of the larger genre of, "What are we actually doing here?" data analytics research in the entertainment industry.

The framing of experience as merely a factor to consider when calculating return on investment is not the only point that emerges — the passage above also reveals how attempts to replicate the exactitude of quantitative research argumentation when offering entertainment industry wisdom can lead to some disappointing revelations. Even when industry experience is considered at a cultural level, where it has tangible value but intangible form, data has to factor its way into the interpretation of this value. In the introductory chapter, the authors suggest "many in the entertainment believe that the decisions that Netflix and, to a certain degree, Amazon have been making [to achieve their levels of success] are, on average, better than those of most established players in the industry."[113] The perceived superiority of their decision-

[112] Hennig-Thurau and Houston, *Entertainment Science*, chap. 5, Kindle.

[113] Hennig-Thurau and Houston, chap. 1, Kindle.

making, the authors explain, derives from the central role of data analytics in these companies' business models. A later section theorizing why audiences derive pleasure from media (via a "sensations-familiarity" framework) yields similar results: "In short, firms must ensure that their products provide experiences that create desired levels of sensations of consumers to generate desirable emotions and imagery."[114] My point, again, is not to score easy points against writing that draws from other scholarly traditions beyond media studies to explain the complex economic and cultural activities that go on in Hollywood. Rather, with respect, I argue there is something significant in the way books like *Entertainment Science* seem so solipsistic, to the point where it is unclear whether there is genuine interest in solving the problems described at the outset of each chapter. In the face of such extensive quantitative modeling and economic theorizing for issues that ultimately, the authors will admit, can never be fully systematized, it is hard to take the totality of such work literally. The experience of reading gradually becomes a sociological or even psychological exercise — what is this *really* about?

Interestingly, one of the must lucid metaphors for explaining how data analytics frameworks should be received in the entertainment industry comes via a comparison to the 2011 sports drama film *Moneyball,* based on the book by Michael Lewis. The two takeaways I want to highlight from the authors' enthusiastic comparison are the centrality of a probabilistic worldview to the *Entertainment Science* paradigm (and to data analytics more broadly), and the role of masculinity in bolstering the authority of this worldview. The film dramatizes the rise of data analytics, or "sabermetrics," in professional baseball in the 1990s-early 2000s. Brad Pitt stars as Oakland Athletics general manager Billy Beane, who hires a data analyst (Jonah Hill) to help build the best team possible given the team's limited budget. Their solution is to disregard

[114] Hennig-Thurau and Houston, *Entertainment Science,* chap. 6, Kindle.

the advice of the team's veteran talent scouts — who insist on paying to retain or acquire expensive, proven players — in favor of quantitative analysis, which allows them to assemble a statistically efficient team made up of lower-tier players whose value emerges only in their total aggregation. "If it is helpful," Houston and Hennig-Thurau write, "think of *Entertainment Science* as "moneyflick," "money tune," "moneygame," and "moneybook" — that is, the *Moneyball* equivalent for entertainment products."[115] *Moneyball* likewise serves as a conceptual and aspirational model for Michael D. Smith and Rahul Telang in *Streaming, Sharing Stealing: Big Data and the Future of Entertainment,* in which the film serves as the focus of an entire chapter exploring human expertise in the era of big data.[116]

I do not believe it simply a matter of accessibility or a desire to be topical that the authors of both data analytics texts use the film and/or the book to demonstrate their interventions. The film's cinematic representations of masculinity and its relationship to expertise make this an inviting comparison for the male authors, who in propping up the film suggest the ways data analytics as a form of cultural knowledge can be situated in the gender dynamics both within and beyond the entertainment industry. To begin, there is the obvious matter of the sports setting; this is a film about the clash of two forms of expertise in a historically male-dominated field. Accordingly, the film features many scenes of men talking shop in clubhouses, gyms, locker rooms, and other male-centric spaces where athletic male bodies are on display. Thematically, the film depicts the rise of sabermetrics not only as a quantitative method but as a shift in the culture of baseball — from a culture based on feelings or misguided metrics to one based on large-scale statistical analysis. To convey the struggle and eventual success of this shift, the film

[115] Hennig-Thurau and Houston, *Entertainment Science,* chap. 1, Kindle.

[116] Smith and Telang, *Streaming, Sharing, Stealing*, 133.

locates the antagonistic resistance to data analytics in an ensemble of old guard of industry veterans who are visually distinguished from Brad Pitt's Billy Beane by age, physical appearance, and intelligence. Whereas Pitt, the champion of data analytics, is conventionally masculine-coded — handsome, confident, decisive, rational (via analytics), and is frequently shown lifting weights — the old guard of talent scouts and managers is comparably old, out-of-shape, irrational (because of inability to quantify or systematize their baseball insights), and stubborn. The focus on Beane's fitness in the film mirrors the strategic agility and flexibility often ascribed to the "upstart content creators" at tech companies like Netflix and Amazon, "who don't have long-standing biases against data-driven decision making.[117] In their description, Smith and Telang describe this cultural clash as a subversion of traditional masculinity — here the hard-core rationality of technology succeeds even over men's experience from the field: "Beane and his team had tapped into the power of data…At a time when most of the people running major-league baseball were former players who refused to believe that guys with computers could teach them anything about the sport to which they had dedicated their lives, Beane and his team brought baseball into the data-driven age."[118]

For Houston and Hennig-Thurau, the *Moneyball* comparison is most useful for illuminating "the essence of the probabilistic worldview" at the root of analytics. They write, "Whereas algorithmic insights cannot guarantee that a single product will become a hit (which would require deterministic knowledge), it raises the probability that products will be successful. This pays across a slate of products, where random deviations from the "average" cancel each

[117] Smith and Telang, *Streaming, Sharing, Stealing,* 138.

[118] Smith and Telang, 136.

other out."[119] The advocacy for a probabilistic worldview — as opposed to the William Goldman "nobody-knows-anything" worldview which, ironically, depends on the fixed certainty that nothing can be predicted — motivates the creation of tools for observing and proving patterns and laws. Houston and Hennig-Thurau do not shy away from acknowledging the pitfalls of their theory-driven, scientific approach; they admit the potential for media companies to be misled by big data's "False-Precision" trap. In this methodological dilemma, the increasing precision of data tracking and analysis systems can cause an overabundance of quantitative relationships and patterns; "A manager can grab data and model them until some significant empirical relationship between a variable and his or her product's success emerges. But our own experiences have shown us that it is likely that such an analysis will yield impressive-looking-but-idiosyncratic results that are of short-term value, at best, or blatantly misleading and even counterproductive at worst."[120]

The "probabilistic worldview" that animates *Entertainment Science* and most quantitative approaches to improving entertainment media production, and that relies on computational technologies to track and process massive amounts of data, proves the endurance of probability as an intellectual tradition. In *The Taming of Chance,* historian and philosopher Ian Hacking explores how a range of scientific, institutional and social forces contributed to make probability an inescapable force for understanding nearly every aspect of society and the natural world. "This imperialism of probabilities could occur," he writes, "only as the world itself became numerical."[121] Probabilism's rise was solidified by technological advancement, in tools for

[119] Hennig-Thurau and Houston, *Entertainment Science,* chap. 1, Kindle.

[120] Hennig-Thurau and Houston, chap. 1, Kindle.

[121] Ian Hacking, *The Taming of Chance* (Cambridge; Cambridge University Press, 1990), 4.

counting, measuring, calculating, and recording. The rise of probability and statistics in government, industry, academia, and other sectors of society appeared to "bring order to chaos" through measurement. There is something of the relentless pursuit of measurements occurring in *Entertainment Science,* where the reluctance to speak beyond the numerical results leaves the impression of somehow limiting the countless variables involved in creative production.

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Chapter 3
From Data to Masterpiece: Exploring AI Creativity as a Model of Artistic Influence

In 2012, researchers in Google's X lab turned a massive neural network system loose on YouTube to study the vast repository of imagery according to its own whims. The artificial brain immediately became fixated on identifying cats, and even produced for Google's researchers a muddled image of its interpretation of a feline face.[1] The unexpected result of X lab's experiment made headlines primarily for its copy-friendly subject matter and humorous commentary on internet culture. For media scholar Steve F. Anderson, the innocuous framing in the media coverage of this and other machine vision experiments leads one to "speculate that these images [both the cat face and an additional human face produced by the neural network] were meant to serve a palliative function, reassuring the public that Google's hosting of billions of hours of valueless video is, in fact, a harmless or even playful endeavor that contributes to the company's stated goal to 'make everyday tasks much easier'."[2] Anderson's critique extends to a related effort by Google in 2015 to humanize its machine vision technologies via an image generator

[1] John Markoff, "How Many Computers to Identify a Cat? 16,000," *New York Times*, June 25, 2012.

[2] Steve F. Anderson, *Technologies of Vision: The War Between Data and Images* (Cambridge, MA: MIT Press, 2017), 92.

program, initially called “Inception-ism” (later Deep Dream). Like the current generation of chatbots and image generators, Deep Dream invited the online community to experiment with the technology and share its discoveries with friends, leading to further amusement in the media when the generator tended to – in an unnecessarily anthropomorphic framing -- “hallucinate” dog faces.[3]

All this is to say that this is not the first time in recent memory when advancements in artificial intelligence (AI) systems have attracted attention outside the tech community. Nor is it the first time these advancements were conveyed to mass audience via a widely-accessible, intuitive, and/or open-source or free-to-use interface. Nevertheless, there is something unique going on in today’s AI landscape. Even prior to the landmark release of OpenAI’s ChatGPT-3 on November 20, 2022, the 2021 release of AI-driven text-to-image generator DALL-E (also OpenAI) sparked a collection of think pieces wondering openly whether this was the beginning of AI takeover of human creative labor. While one writer for *New York Magazine* asked whether “DALL-E the AI Artist [Will] Take My Job?”, another for *The Washington Post* declared that the system’s power elicits “wonder and danger.”[4] While snark always finds a way to survive online in even the most grave contexts, the reception of DALL-E, ChatGPT, as well as similarly popular AI-driven programs like Midjourney (2022, Midjourney, Inc.), Stable Diffusion (2022, Stability AI) quickly overwhelms with its anxieties and philosophizing. As for developers, they seem less interested in the offering palliation, as in Anderson’s examples, and instead offer dramatic warnings of AI’s “extinction” threat.[5]

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[3] John Brownlee, “Why Google’s Deep Dream A.I. Hallucinates In Dog Faces,” *Fast Company*, July 23, 2015.

[4] Megan Paetzhold, “Will DALL-E the AI Artist Take My Job?,” *New York Magazine,* September 4, 2022.; Nitasha Tiku, “AI Can Now Create Any Image in Seconds, Bringing Wonder and Danger,” *Washington Post*, September 28, 2022.

[5] Kevin Roose, “A.I. Poses ‘Risk of Extinction,’ Industry Leaders Warn,” *The New York Times*, May 30, 2023.

Beyond its tonal distinction, the ongoing discourse around AI systems also comprises a wider range of institutional voices than before, from parties who believe the latest developments in AI represent looming or even urgent threats to their industries, fields, and professions. Even OpenAI seems willing to stoke labor pessimism, as they published a research paper in 2023 estimating "80% of the U.S. workforce could have at least 10% of their work tasks affected by the introduction of GPTs," in a threat that "spans all wage levels, with higher-income jobs potentially facing greater exposure."[6] In higher education, the advancements in chatbots made in 2022-2023 singularly threaten to undermine the foundations of course design, assessment practices, and the role of student writing, particularly in the humanities.[7] *The Chronicle of Higher Education* labeled ChatGPT a "plagiarism machine," both for its (already) pervasive use by students to complete writing assignments and the reliance of its generative abilities on the words of countless others. The pressure for universities to respond to these sudden and extraordinary developments, mostly through updates to academic integrity policies, has reached even my small institution in rural Vermont, where a series of passionate faculty meetings in January 2023 evoked philosophical speculations about AI's impact on society, as well as a general sense of despondency over its presumed corruption of college education. Adding to the feeling that these technologies had turned a corner compared to previous systems, chatbots are proving capable of passing law school exams, the MCAT, the SAT test, and other

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[6] Tyna Eloundou et al., "GPTs Are GPTs: An Early Look at the Labor Market Impact Potential of Large Language Models" (arXiv preprint, March 23, 2023), https://doi.org/10.48550/arXiv.2303.10130.

[7] Joseph M. Keegin, "Opinion: ChatGPT Is a Plagiarism Machine," *The Chronicle of Higher Education*, May 23, 2023.; Beckie Supiano, "Will ChatGPT Change How Professors Assess Learning?," *The Chronicle of Higher Education*, April 5, 2023.

professionalization degrees, raising concerns across disciplines about the centrality of human agency in the future of work.[8]

Whether the discussions currently taking place around AI are premature or overdue, overly alarmist or too unaffected (arguments could be made for all), it is clear that since at least 2022, the realities of technologies capably performing "knowledge" work suddenly crystallized in mainstream consciousness. Within many of the discussions around AI, a recurring question emerges in which the technical processes through which these technologies are understood to "think" are compared and contrasted with beliefs about the workings of the human brain. Yet rarely does one find a defense of the human mind from the fields devoted to its literal study — neuroscience, cognitive science, psychology, etc.; more often, these inter- and intra-disciplinary debates are driven by romantic visions of human inspiration, imagination, and invention. I am most interested in this discursive pattern, as I argue it demonstrates how critical the current moment is for shaping the future of creativity and, as I will elaborate below, conceptualizations of artistry. In making this argument, I am not advancing any speculations about whether future versions of today's large language models (LLMs) and image generators will displace human creativity or labor. Rather, I argue the intensified concern over AI text- and image- generators is currently the most revealing lens through which to find evidence of the tech world's influence on popular understandings of creativity and artistry.

Philosophy of technology scholar Mark Coeckelbergh has argued that while, yes, there is an inevitable de-centering of the human artist when using AI to produce images or text, this dynamic *dissolves* the binary between human and machine creativity rather than definitively

[8] "ChatGPT Bot Passes Law School Exam," *CBS News,* January 25, 2023.

elevating one side over the other.[9] Coeckelbergh argues instead for a process-oriented conception of the human artist-AI interaction that understands human creativity and machine intervention as part of a multi-stage, "co-(techno)performance" that produces not only art, but also human and non-human "artistic subjects" – the artist, the tool-as-artist, and even the critics and art world stakeholders who evaluate the works. Such a conception, described evocatively as a "dance of agency" beginning with the human text prompt, is truer to the specificities of these technologies than simple instrumentation or extension models, wherein artist motivation is privileged, AI is a passive tool, and which have little to nothing to say about the unpredictability or "surprises" that arise from AI art generation.[10] While such work helps frame the creativity required from humans to make interesting work with image generators and other AI tools,

The Writers Guild of America is bringing these questions about the differences between technical processes performed by machines and creative processes performed by humans into the limelight through its ongoing strike (May 2, 2023—present) against the Alliance of Motion Picture and Television Producers (AMPTP). The main issues for Hollywood screenwriters heading into the labor dispute include ensuring fair wages, limiting the use of "mini rooms" that reduce writing opportunities, securing residuals for writers in the streaming environment, and claiming for the guild and its members the right to shape the future of AI in Hollywood storytelling. The negotiations between the Writers guild and the AMPTP represents the most widely publicized, if not the first, labor dispute to include regulating the use of artificial intelligence (in its current form) as a main goal.

[9] Mark Coeckelbergh, "The Work of Art in the Age of AI Image Generation: Aesthetics and Human-Technology Relations as Process and Performance," *Journal of Human-Technology Relations* 1 (June 12, 2023): 1-13.

[10] Coeckelbergh, "The Work of Art," 6–7, 10.

The obvious disadvantages of approaching this topic in 2023 are 1) the rapid advancement of the AI industry 2) the dynamic, ongoing responses to these technologies that threaten the long-term relevancy of any discursive thread. In his work on AI, Steve Anderson proposes "turning the bug of rapid technology development into a feature of the analysis," wherein a "slow and historically minded approach will readily expose the most damning tenets on which the technology is predicated."[11] The logistics of academic scholarship will inevitably delay writing on current events, and as such I too acknowledge that certain ideas in this chapter – including commentator's interpretations of training data sets – might lose potency as either understandings about AI technologies change, or other aspects of their design and implementation draw more interest. But considering my investments in contemporary AI discourse are driven by historical concerns with the mechanization of human thinking (based around technically outdated objects), I offer this chapter as a historical snapshot informing a longer discussion on human-technology interactions.

As of this writing, the Writers Guild's primary goal for AI can be summarized as wanting to eliminate or otherwise regulate any uses of AI that "undermine writers' working standards including compensation, residuals, separated rights and credits."[12] Specifically, this includes prohibiting the use of AI to generate core source material, or "literary material," that Guild writers would then be hired to rewrite or adapt. Writers' concerns are that in such a scenario, production companies would have an excuse to both cut early-stage writing jobs to reduce costs

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[11] Steve F. Anderson, "Allegories of Streaming: Image Synthesis and/as Remix," in *The Routledge Handbook of Remix Studies and Digital Humanities,* eds. Eduardo Navas, Owen Gallagher, and xtine burrough (Routledge, 2021), 356.

[12] Writers Guild of America, West (@WGAWest), "The WGA's Proposal to Regulate Use of Material Produced Using Artificial Intelligence or Similar Technologies Ensures the Companies Can't Use AI to Undermine Writers' Working Standards Including Compensation, Residuals, Separated Rights and Credits. #WGAStrong 🧵1/7," Twitter, March 22, 2023, https://twitter.com/WGAWest/status/1638643544977195008.

(especially entry-level spots) *and* pay these second-stage writers at a lower pay grade. An additional goal is to ensure the use of AI does not factor into credit designations; for instance, the Guild wants to avoid today's provocative AI stunts from becoming an industry norm — like crediting Chat-GPT as a co-writer in the March 2023 episode of *South Park,* "Deep Learning" (E4:S26).

Many in Hollywood consider the use of AI to generate development-stage material very likely compared to the wholesale replacement of human writers with AI technologies. "The fantasy of technology will be used to devalue us, to pay us less," says Adam Conover, who serves on the WGA negotiating committee.[13] This kind of AI use ultimately promises to further the decades-long work of bottom-line-minded producers to turn screenwriting into a predominantly freelance or gig-driven craft. To combat this, the Guild's current position concedes the ability of producers to make *suggestions* based on material produced by AI, but stipulates these materials cannot be considered primary source material.[14] The Guild underlines the importance of this distinction by comparing AI-generated texts to other research materials like Wikipedia articles that producers can ask writers to consult. "But, like all research material, it has no role in guild-covered work, nor in the chain of title in the intellectual property."[15] One is reminded of a scene in the Hollywood satire *The Player* (1992, dir. Robert Altman), in which an upstart studio executive (Peter Gallagher) improvises film scripts based on random newspaper headlines, arguing that if the studio could create its own stories -- from "anywhere, it doesn't

[13] Ashley Cullins and Katie Kilkenny, "As Writers Strike, AI Could Covertly Cross the Picket Line," *Hollywood Reporter*, May 3, 2023.

[14] Jose Alejandro Bastidas and Umberto Gonzalez, "Chatbots Flip the Script: For Screenwriters, AI's Evolution Brings New Tools and New Fears," *The Wrap*, April 10, 2023.

[15] Writers Guild of America West (@WGAWest), "The WGA's Proposal," Twitter, March 22, 2023.

matter" – it could save substantial time and money. Sardonically, senior executive Griffin Mill (Tim Robbins) reflects, "What an interesting concept it is to eliminate the writer from the artistic process. If we can get rid of the actors and directors, maybe we've got something here."[16] So while AI is the focal point of these important debates, it is worth remembering how Hollywood's willingness to devalue writers has been a running joke before ChatGPT.

Validation for pessimism about AI's eventual incorporation in creative work can already be found at the highest levels of the entertainment industry; in May 2023, Bob Iger confirmed Disney is "already starting to use AI to create some efficiencies and ultimately to better serve customers"[17]; A month later, Disney's Marvel Studios released the streaming miniseries *Secret Invasion,* which featured an opening credits sequence with alien-looking, AI-generated artwork featuring star Samuel L. Jackson. The criticism was immediate for one of the wealthiest and most ubiquitous industrial forces in big-budget media making, who is already facing criticism for creatively bankrupt cost-cutting measures in visual effects departments. In a discouraging defense of the AI-generated opening credits, executive producer Ali Salim said the technique was "explorative and inevitable."[18] In pushing back against the use of AI to devalue the creative work of brainstorming, outlining, and drafting, the Guild and other writers also face challenges from the trade press. This includes vague, threatening reports from executive "insiders" claiming studios will amp up AI development while writers are on the picket lines, or headlines that dubiously place blame on those advocating for a say in shaping their working conditions, as in

[16] *The Player*, directed by Robert Altman (Avenue Pictures, Spelling Entertainment, 1992).

[17] Jill Goldsmith, "Disney CEO Bob Iger Calls AI 'Disruptive,' Difficult To Manage From An 'IP Perspective,'" *Deadline,* May 10, 2023.

[18] Charles Pulliam-Moore, "Unfortunately, Secret Invasion's AI Credits Are Exactly What We Should Expect from Marvel," *The Verge*, June 27, 2023.

The Wrap's "The Hollywood Writers' Strike May Actually Be Aiding AI's Takeover."[19] Considering the use of AI is already a norm in certain divisions of Hollywood work, especially visual effects departments (de-aging, cosmetic filters, the recent trend of reviving deceased actors), the writers' position is not the elimination of the technology, but rather, as a plane banner flying over Los Angeles in May 2023 read, just "Pay the Writer You AI-Holes."[20] Finally, as the Screen Actors Guild - American Federation of Television and Radio Artists (SAG-AFTRA) and Directors Guild of America are currently in their respective negotiations with AMPTP, the results of the WGA's first swipe at AI regulation will likely influence its utilization in the whole of Hollywood.[21]

Even as the strike's us-versus-them framework tends to skew the discourse towards binaristic or determinist narratives of robots replacing human writers, the arguments emerging around this historic event attest to significance of Hollywood as a key site for predicting, understanding, and perhaps even determining how machines will impact human creativity into the future. "The Guild is in the position of trying to imagine lots of different possible futures," says James Grimmelmann, Professor of Digital and Informational Law at Cornell University.[22] Hollywood's most recognizable craftspeople, specifically screenwriters and directors, are being utilized in AI discourse alongside a range of visual artists as emblems of human creativity and artistry in the most abstract sense. In an emerging genre of articles testing the ability of chatbots

[19] Robert Carnevale, "The Hollywood Writers' Strike May Actually Be Aiding AI's Takeover," *The Wrap*, May 15, 2023.

[20] Katie Campione, "'Pay The Writers You AI-Holes': Plane Flies Banner Over L.A. Studios In Solidarity With WGA," *Deadline*, May 15, 2023.

[21] Dominic Patten, "SAG-AFTRA Strike Could Hinge On AI; Deep Divisions Remain Between Actors & Studios in Final Hours of Talks," *Deadline*, July 11, 2023.

[22] Jake Coyle, "Could AI Pen 'Casablanca'? Screenwriters Take Aim at ChatGPT," *Associated Press*, May 5, 2023.

to produce a creative document including movie scripts, Stuart Heritage of *The Guardian* argues that even the imperfect abilities of Chat-GPT to generate Hollywood-ready narratives shows how "even the most human of arts" are not invulnerable to mechanization.[23] Gavin Mueller makes a similar statement when he calls screenwriters "The Luddites of Hollywood", describing how the "new, high-profile AI tools such as Midjourney and ChatGPT are oriented toward *the quintessentially human endeavors of art and language*" [emphasis added].[24] In a *separate* characterization of Hollywood screenwriters as Luddites, Angela Watercutter says screenwriters' AI concerns function as "an argument for human creativity, for people who understand new technologies and can work on them" when compared to the similar desires of the famous English textile workers; quoting Kevin Binfield, "They just wanted machines that made high-quality goods…and they wanted these machines to be run by workers who had gone through an apprenticeship and got paid decent wages."[25] The recurrence of hyperbolic comparisons between today's Hollywood screenwriters and the Luddites suggests both the anticipated effects of AI on labor and the way Hollywood's artists are serving as test subjects for a technology-driven transformation to society comparable to the Industrial Revolution.

In its attempts to ensure fair crediting and remuneration for Hollywood writers, the Guild's 2023 strike is also advancing arguments about machine creativity. As the Writers Guild of America West Twitter account emphasizes, "it's important to note that AI software does not create anything. It generates a regurgitation of what it's fed."[26] Indeed, it is within this gray area

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[23] Stuart Heritage, "Can an AI Program Really Write a Good Movie? Here's a Test," *Guardian*, March 24, 2023.

[24] Gavin Mueller, "The Luddites of Hollywood," *Atlantic*, May 15, 2023.

[25] Angela Watercutter, "AI, the WGA Strike, and What Luddites Got Right," *Wired*, May 5, 2023.

[26] Writers Guild of America, West (@WGAWest), "The WGA's Proposal."

of copyright law that the questions about machine creativity and its relationship to human creativity find their most tangible stakes. For once, the pressure on government and industry regulating bodies to soothe any issues befalling big business will be somewhat welcome, as this pressure will work in favor of expediting the formation of perspectives around these legal issues. The answers offered to move forward on regulating AI may not be informed, thoughtful, or prescient, but there *will* be answers. And the copyright precedents that emerge from these proceedings will be the result not purely of legal interpretation but of soon-to-be-common-sense beliefs about whether AI's abilities constitute a recognized form of originality, creativity, and artistry. Or, perhaps more accurately, the legal interpretations around intellectual property will follow the lead of the emergent political economic powers, who will influence and benefit from the construction of these common-sense beliefs. Even if AI is determined *not* to represent a recognized form of creativity, the agreed-upon limiting factors of this determination will be equally revealing in their implications for human creativity and its mechanization.

The entertainment industry therefore has an important role in shaping the machine-assisted creativity discourse both within its industrial "niche" and in the broader societal context. Within Hollywood, this role is already being recognized and articulated in the form of antagonism towards those seemingly most responsible for the emerging AI boom: science and technology workers. "When people conclude [AI] is going to replace professional writers," says one "prominent writer and showrunner" to *The Hollywood Reporter*, "I think they're sort of swallowing an Elon Musk-style fantasy about the future that is not actually connected to the technology."[27] There is more to this comment than initially appears. First, naming Elon Musk

[27] Katie Kilkenny and Winston Cho, "Attack of the Chatbots: Screenwriters' Friend or Foe?," *Hollywood Reporter*, January 12, 2023.

specifically can be understood as a reference to his early investment in OpenAI, the company behind Chat-GPT. More importantly, this unnamed Hollywood showrunner places blame on Musk as a representative of Silicon Valley's unwarranted and arguably irresponsible tendency to promise the world and deliver nothing. Musk's portfolio is riddled with exactly these kinds of public fixations, most famously his infrastructural project proposals like the Hyperloop and underground tunnel systems in Las Vegas, NV. This showrunner's intuition identifies the growing influence of ideologies from the science and technology communities in Silicon Valley on Hollywood's relationship to technology, and, by extension, on how artistry can be optimized through its use.

In their introduction to *The Mechanical Mind in History,* Philip Husbands, Owen Holland and Michael Wheeler describe how public understandings of "intelligent machines" derive not only from the actual science done to develop these machines, but also "through myths, literature, and popular science."[28] I argue that Hollywood has become a legitimate discursive force in popular science as a result of its courtship with Silicon Valley; likewise, Silicon Valley has expanded and permanently solidified its discursive authority within creative and artistic circles through its relationship with Hollywood. This chapter explores the evidence for this and its ramifications for the future of creative work. Legacy Hollywood occupations, production methods, and cultural practices consistently appear in AI discourse as lenses for understanding these technologies. These appearances take on multiple and shifting forms: Hollywood as a current events case study for reactions to AI and its developing applications for knowledge work; Hollywood as an example of a quintessentially humanistic industry vulnerable to sensational

[28] Phil Husbands, Owen Holland, and Michael Wheeler, eds., *The Mechanical Mind in History* (Cambridge, MA: MIT Press, 2008), 1.

upheaval by way of AI; and perhaps most common, Hollywood as an archive of metaphors for describing the pleasures of creation and artistic discovery one experiences while using AI.

A recent piece for *Wired,* "Engines of Wow," by executive editor Kevin Kelly, checks nearly all of these rhetorical boxes and exemplifies the utility of the entertainment industry in conceptualizing AI technologies within a popular science framework. "Not everyone can write, direct, and edit an Oscar winner like *Toy Story 3* or *Coco*," writes Kelly, "but everyone *can* launch an AI image generator and type in an idea."[29] Kelly is prudent to choose films by Disney's Pixar as the exemplary creative texts, as the animation studio is famed for producing the first feature-length computer animated film, *Toy Story* (1995). The studio would be well-known to even the most arts & culture-averse *Wired* readers as proof-of-concept for the merging of the artist and the engineer in Hollywood, and for the company's connections to Steve Jobs and Apple. Kelly's optimism about the accessibility of art via image- and text-generators is suggestive for its similarity to the discourse of "democratization of information," education, and other social and political resources characteristic of early Internet cultures. AI advancement will soon allow everyone to create "Pixar films in an instant!"[30] But Kelly's insistence that artistry will be democratized through AI is only the premise for a re-interpretation of Hollywood creative work that levels its professional hierarchies and adapts Hollywood labor to structure AI users' creative subjectivities in line with these traditional artistic crafts. The creative legitimacy of AI artists comes not only in the resulting products but in the users' production processes, in this case the process of devising the best prompts for achieving desired images or text. "Behind this new imagecraft [producing AI art] is the art of prompting. Each artist or designer develops a way of

[29] Kevin Kelly, "Engines of Wow," *Wired*, November 17, 2022, 36.

[30] Kelly, "Engines of Wow," 46.

persuading an AI to yield its best by evolving their prompts. Let's call these new artists AI whisperers, or promo artists, or promptors. The promptors work almost as directors, guiding the work of their alien collaborators toward a unified vision."[31] Later, the comparison to Hollywood directors is completed. Kelly writes, "it seems obvious to me that promptors are making true art. What is a consummate movie director — like Hitchcock, like Kurosawa — but a promptor of actors, actions, scenes, ideas? Good image-generator promptors are engaged in a similar craft."[32] As in every survey of popular discourse, but especially that pertaining to science and technology, the freewheeling hyperbole should not overshadow the subterranean cultural beliefs that make these *kinds* of arguments feel possible, acceptable, and even valid. In this and similar conversations, the ability of AI to capture or emulate aspects of Hollywood labor is considered a measurement of technologies' technological sophistication and represents an impressive engineering feat.

The popular discourse around AI and creativity provides a useful introduction to this chapter because it underlines how Silicon Valley is competing with Hollywood to define artistry as creative work becomes increasingly reliant on the tech industry. This chapter explores a handful of similar case studies where technical solutions are offered as solutions to creative problems. During the process of designing around creative roadblocks, engineering sensibilities can be seen creeping into artistic work cultures and thus informing the labor context for future creative work. Unlike the previous chapter, which explored from an institutional and industrial perspective Netflix's role in shaping Hollywood's "culture of empiricism," this chapter concerns itself with the personal attitudes, values and practices of artistic "thought leaders" operating in

[31] Kelly, "Engines of Wow," 40.

[32] Ibid.

what Daniel Bernardi and Julian Hoxter would call the creativity "paraindustry" of gurus, workshop leaders, creativity-related app designers, and other such roles.[33] The vagueness of this paraindustrial category indicates how part of the point of these hybrid inspirational/instructional texts is to broaden the definition of artistry beyond recognition, to include nearly anyone who considers their work creative. This paraindustrial function tracks with Professor of Fine Arts David Trend's critique of modern creativity culture, where "rather than emphasizing the nurturing values that give artistry its emotional appeal, the "new" creativity seems more driven by individual competition and profit than humanistic impulse."[34] This kind of messaging has the effect of both maximizing the audience for the ideas (and products) in question and, as a side effect, further weakening the legacy of Hollywood's claim to exclusive or even central authority in these arenas.

The first section extends the above discussion about AI art to explore how the use of massive training data sets to improve image- and text-generators is informing beliefs about improving one's own creative "output." Training data sets are at the root of many of the key ongoing conversations around the AI and machine learning landscapes, including whether AI's output should be considered plagiarism since its creations inherently derive from prescribed data sets. Moreover, many critiques of current AI technologies point to a direct correlation between the size of training data sets and the capability of the machines, often as a way to illustrate the inevitability of these technologies one day having been "fed" the entirety of print history, and thus achieving a level of mastery over information humans could never match. The theoretical

[33] Daniel Bernardi and Julian Hoxter, *Off the Page: Screenwriting in the Era of Media Convergence* (Oakland, CA: University of California Press, 2017), 3.

[34] David Trend, *Anxious Creativity: When Imagination Fails* (New York: Routledge, 2019), 12.

potential to reverse-engineer how various points within a data set ultimately informed specific qualities of a given AI-generated product encourages commentators to re-theorize and even quantify the way artistic influence and inspiration work in creative production. Can one's artistic abilities also be improved by considering one's influences and experiences part of a personal "data set?" This section explores a selection of texts that address these questions, and in doing so turn data set evaluation into a cultural exercise evaluating the quality and character of the exact "input" to produce satisfactory art.

Training Data in Context

The remainder of this chapter refers to "training data(sets)" and "databases" in a broad but intentional way that highlight how these terms are serving, appropriately or not, as technological metaphors for the processes of creativity and artistic influence in entertainment and popular science discourses. Their complete technical definitions, however, can refer to multiple and shifting objects, which must be briefly addressed and clarified before moving on.

Despite the vast technical variety of systems within the area of machine learning, I argue a general overview of the shared characteristics is still useful for: first, clarifying which categories of systems are under consideration in this chapter, and second, for outlining the basic methodological and philosophical premises of these systems. I do not pretend to possess mastery over these systems in the way a computer scientist or even some scholar-practitioners working in digital humanities might, but this does not and should not prevent critique of the relationship between technical design and cultural impact. As Steve Anderson argues, the sheer "complexity of AI, which purports to elude all but the most highly trained computer scientists," should not facilitate us "allowing technologies to be occulted to the point where non-computer scientists

seem to have nothing to contribute to their understanding."[35] This argument extends to what some might see as my indulgence of popular writing in this chapter. Though I am interested in the aesthetic implications of generative AI, I do not want to duplicate arguments by scholars like Eduardo Navas, Owen Gallagher, and xtine burrough, who have already begun the work of bringing together critical perspectives from digital humanities, fine arts, and art history to theorize and creatively engage the relationship between digital infrastructures and remix practices.[36] Scholars in this area address the implications of machine learning and Chat-GPT on aesthetic and literary theories – for instance, Dejan Grba's work on generative art and bricolage[37] -- demonstrating the major role art, music and visual culture has had on exploring the philosophy of digital technologies. Writing for one of Navas et. al's multiple edited volumes on remix, Eran Hadas compares automatic text generation to a form of remix, arguing the two are "closely related" and that "remix can be seen as a baseline algorithm to the manipulation and generation of texts."[38] I also look for places where computational and cultural logics become blurry -- where one becomes a way to understand some aspect of the other. My privileging popular commentary on generative AI – including that which appears to echo ideas like Hadas's – is meant to capture and respond to the misapprehensions and enthusiasm around these discussions emerging in a historically situated media culture. These pop commentaries matter not

[35] Anderson, "Allegories of Streaming," 356.

[36] Eduardo Navas, Owen Gallagher, and xtine burrough, eds., *The Routledge Handbook of Remix Studies and Digital Humanities* (New York: Routledge, 2021).

[37] Dejan Grba, "Always Already Just: Combinatorial Inventiveness in New Media Art," in *The Routledge Handbook of Remix Studies and Digital Humanities,* eds. Eduardo Navas, Owen Gallagher, and xtine burroughs (Routledge, 2021), 366–84.

[38] Eran Hadas, "Hallucination or Classification: How Computational Literature Interacts with Text Analysis," in *The Routledge Handbook of Remix Studies and Digital Humanities,* eds. Eduardo Navas, Owen Gallagher, and xtine burroughs (Routledge, 2021), 300.

simply because they tend to oversimplify or sensationalize and thus need course-correction – they are typically more concerned with clarity than consistency -- but also because their dependence on audience engagement makes apparent how interpretations of technologies are responsive to trends in journalism, economics, politics, and internet cultures. If we dismiss them as reactionary, ill-informed, misleading, and repetitive, we risk underestimating these features as significant and inevitable frameworks for interpretating technologies.

To begin, machine learning and its more specialized forms like deep learning are types of artificial intelligence (AI) that allow machines to form and refine mathematical models for making statistical predictions. Machine learning algorithms differ from previous kinds of algorithms in that they do not depend entirely on hard-coded, or dynamically harvested, data in their systems to function — they instead can improve their models via their "ability to acquire their own knowledge, by extracting patterns from raw data" from external sources.[39] This "raw data" from external sources can come in various sizes and forms, in increments or in continuous, real-time processes, and with various levels of "supervision" from human designers.[40] Note that "raw" data does not preclude engineers' various manipulations of the dataset to make it suitable for "feeding" into the machine learning algorithm; even without such manipulations, the act of collection and arrangement undermines the connotations of purity or objectivity in the term "raw."[41] For the purposes of this chapter, it is most important to know that training datasets constitute one form of external data used to teach machine learning algorithms how to perform

[39] Ian Goodfellow, Yoshua Bengio, and Aaron Courville, *Deep Learning* (Cambridge, MA: MIT Press, 2016), 3.

[40] Aleksy Bilogur, "Full Batch, Mini-Batch, and Online Learning," Kaggle, accessed August 1, 2023, https://kaggle.com/code/residentmario/full-batch-mini-batch-and-online-learning.

[41] Lisa Gitelman, ed., *"Raw Data" Is an Oxymoron* (Cambridge, MA: MIT Press, 2013).

their tasks. Or, in the simple terminology of Brian D. Ripley's *Pattern Recognition and Neural Networks:* a "training set" is "a set of examples used for learning."[42]

The term "training data" can also be used as an umbrella term to refer to the additional and related datasets used to test, evaluate, and refine machine learning algorithms after the first "training" process. This more technical and inclusive usage can be found across textbooks in computer science's various subfields, but it follows logically at least in the sense that these sets comprise various and multiple stages of an overall training initiative. When specified and delineated, the datasets considered part of the inclusive "training data" usage include the "training set," described above, the "validation set," and the "test set" or "holdout set." The validation and/or test sets are, generally, used as refining tools for revealing how a machine learning algorithm is functioning and where issues in its functioning might reside — or in the technical parlance, to "test errors associated with fitting a particular statistical learning method on a set of observations."[43] Ripley's distinction between the validation and test sets is subtle — one is used to "tune" and the other to "assess the performance" — and demonstrates the close relation of these sets.

Machine learning depends on training data as it allows machines to "improve with experience" (in the form of data) and ultimately make complex decisions seemingly independently, including and especially those related to the generation of text and images.[44] The current generation of AI has benefitted from the increasing digitization of society, which means it

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[42] Brian D. Ripley, *Pattern Recognition and Neural Networks*, (Cambridge, MA: Cambridge University Press, 1996), 354.

[43] Gareth James et al., *An Introduction to Statistical Learning: With Applications in Python*, 2023 ed. (Springer, 2023), 176–78.

[44] Goodfellow, Bengio, and Courville, *Deep Learning*, 3.

becomes easier for engineers to collect and share data for training data sets. As Ian Goodfellow et al. describe in their popular textbook *Deep Learning,* "The age of "Big Data" has made machine learning much easier because the key burden of statistical estimation — generalizing well to new data after observing only a small amount of data — has been considerably lightened."[45] The ease of tracking and centralizing vast amounts of data through the internet has improved computer scientists' abilities to "provide these algorithms with the resources they need to succeed," which in 2016, meant training with "at least 10 million" examples to "match or exceed human performance" in a typical task.[46] The demand for training data in various machine learning applications has boosted popularity of sites like Kaggle (currently 14 million users) and Data Camp (over 10 million users), where engineers and data scientists can publish, share, and download datasets of all types.[47]

There are a few reasons why "training data(sets)," in the inclusive usage, serves as a ripe metaphor for structuring beliefs about artistic influence, experience, and creative production. Of course, there is the fact that machine learning is being used more commonly to produce text and images most would consider artistic — whether this is creative writing, visual art, photorealistic imagery, and so on. These applications popularize a scientific correlation between experience and creative ability that, like many ideas from the tech world, inevitably influence thinking far beyond their original contexts. For example, the popular use of text-to-image generators like

[45] Goodfellow, Bengio, and Courville, 19–20.

[46] Goodfellow, Bengio, and Courville, 19–21.

[47] Carl McBride Ellis, "Kaggle in Numbers," Kaggle, accessed August 4, 2023, https://kaggle.com/code/carlmcbrideellis/kaggle-in-numbers.; "Financial Times Recognized DataCamp as One of the Americas' Fastest Growing Companies 2022," *Life at DataCamp* (blog), April 2022, https://www.datacamp.com/blog/ft-ranking-datacamp-recognized-as-one-of-the-americas-fastest-growing-companies-2022.

Dall-E to produce a "picture of *x* in the style of *(individual artist, text, or tradition),*" provides a mechanized, instrumentalized version of artistic influence that researcher Leon Gaty's calls "style transfer." In his analysis of the style transfer process, Arthur I. Miller provides this indicative interpretation: "Style is a nebulous concept that art historians argue over. It takes years of training and experience for an art historian to be able to distinguish an artist's work by its style. Could it really be something a machine could grasp? Could a neural network separate style from content and miraculously produce a work that looked as if it had been recovered from the studio of a long-dead master? It seems it could."[48] The intuitive understanding that more data from as many different sources as possible equals unambiguous progress for machine learning applications has alluring implications, especially for artists. It offers a way to think of the creative mind as a machine, too — to think systematically, rigorously, and scientifically about improving one's creativity and craft. As with AI algorithms, one's output is directly related to the input, and more input means more to draw from during artistic "processing." This structuring metaphor is not completely faithful to the actual process of machine learning, but seductive cultural logics are rarely negated in the face of such evidence.

Instead, these interpretations of the relationship between input/output evoke the creativity-augmentation philosophies animating art-tech collectives like E.A.T. in the 1960s-70s. The Experiments in Art and Technology (E.A.T.) group was a collaboration between AT&T's Bell Labs engineers (led by Billy Klüver) and artists including John Cage, Deborah Hay, Marta Minujin, Robert Rauschenberg, and others. The collective's 1966 theatrical performance art piece *9 Evenings: Theatre and Engineering,* described retrospectively by Nokia Bell Labs as "the first large-scale collaboration between artists and research engineers," featured conceptual art

[48] Arthur I. Miller, *The Artist in the Machine: The World of AI-Powered Creativity* (Cambridge, MA: MIT Press, 2019), 83.

designed around specially-engineered technologies like television projections, radio-controlled platforms, and various biometric devices.[49] Beyond live performance art, E.A.T. also produced landmark computer-generated art, like *Computer Nude (Studies in Perception 1)* by Leon Harmon (a cognitive neuroscientist) and Ken Knowlton (Bell Labs engineer). The piece used software to produce a "bitmap mosaic" based on a photo of Deborah Hay in repose.[50] Across their works, E.A.T. celebrated the capacity of machines to execute algorithms – or follow instructions – based on human input. Critically, this focus on human input and invention for specific artistic applications allowed E.A.T. to elide the questions about creative attribution – it was most certainly the artists and engineers who were using technology to enable and execute a different kind of human creativity that demonstrated the potentials for human-machine collaboration. By comparison, the current debates about creative attribution appear somewhat stubbornly to reject this kind of two-way movement of technological logics, wherein humans become more machine-like and machines become more human-like during the creation process.[51]

While popular understandings of the use of massive training datasets to improve sophisticated AI systems provides a scientific rationality to theories of creativity that depend on a combination and collection of influences, there is one important distinction I want to make about the actual machine learning process. Most pop theories of the creative mind that I argue are influenced by AI discourse do not distinguish between supervised and unsupervised machine learning. They have no reason to. But I argue it is innovations in unsupervised learning

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[49] "The Genesis of E.A.T.," Nokia Bell Labs, February 14, 2023, https://www.bell-labs.com/about/history/innovation-stories/genesis-eat/.

[50] "Computer Nude (Studies in Perception I)," Buffalo AKG Art Museum, accessed August 1, 2023, https://buffaloakg.org/artworks/p20142-computer-nude-studies-perception-i.

[51] Anderson, *Technologies of Vision*.

specifically that motivate the current moment of radical speculation about creativity, the relationship between AI "brains" and human brains, and ultimately the idea that AI technology has crossed a threshold that threatens human creativity at all.

The main difference between supervised and unsupervised learning is that supervised learning utilizes labeled and/or annotated training datasets, whereas unsupervised learning feeds algorithms data that is unlabeled. Labeled in this context means pre-categorized by the designers, with the specifics of the categorization dependent on the machine learning task the designers are trying to "teach" the algorithms to perform. Padraig Cunningham, Matthieu Cord and Sarah Jane Delany offer this simpler framing that demonstrates how supervised learning often supports future unsupervised learning: "The name [supervised learning] invokes the idea of a 'supervisor' that instructs the learning system on the labels to associate with training examples. Typically, these labels are class labels in classification problems. Supervised learning algorithms *induce* models from these training data and these models can be used to classify other unlabeled data."[52] Accounts of the creation of Chat-GPT detail the use of both supervised and unsupervised learning, much in the progressive way described by Cunningham et al.[53]

In her book *Artificial Unintelligence: How Computers Misunderstand the World,* data journalism professor Meredith Broussard walks readers through a machine learning experiment that illustrates the supervised learning process and the differences between the various types of training data described above. Broussard, a software programmer, sets out to develop an

[52] Pádraig Cunningham, Matthieu Cord, and Sarah Jane Delany, "Supervised Learning," in *Machine Learning Techniques for Multimedia: Case Studies on Organization and Retrieval*, eds. Matthieu Cord and Pádraig Cunningham (Berlin, Heidelberg: Springer, 2008), 21.

[53] Alec Radford et al., "CLIP: Connecting Text and Images," OpenAI, January 5, 2021.; Jon Gertner, "Wikipedia's Moment of Truth," *New York Times*, July 18, 2023.; Marco Ramponi, "How ChatGPT Actually Works," *Assembly AI* (blog), December 23, 2022, https://www.assemblyai.com/blog/how-chatgpt-actually-works/.

algorithm that can predict which passengers survived the sinking of the RMS *Titanic* in 1912. Broussard notes that acquiring datasets is the first step in any machine learning development process. Evidently, the availability and accessibility of *Titanic's* passenger records makes this exercise a favorite in data science and computer engineering classes.[54] Training data is thus functionally the origin point of mechanical "thought", fueling machine learning algorithms that, as Goodfellow et al. describe, "[enable] computers to tackle problems involving knowledge of the real world and make decisions that appear subjective."[55] Once the dataset is acquired, Broussard splits it into two components: the "training data" and the "test data."[56] The training data consists of twelve items of passenger information, including demographic information like name, age and sex, as well as logistical details like ticket number, fare price, and cabin location. Critically, the training data also includes individual survival records — 0 for did not survive, 1 for survived. The separate test data does *not* include the survival records, since Broussard's dataset comes from a tutorial built by the data science website Data Camp. The absence of this information allows the dataset to serve as the training data set following the model's supervised learning from the training data set. Any information about errors is "back propagated" through the algorithm, which allows the algorithm to adjust its parameters accordingly. The narrow scope of this AI exercise demonstrates supervised learning and its reliance on a high degree of oversight by Broussard, the input of labeled data that indicates to an algorithm the desired takeaways to use for producing an output, and the verification of the algorithm's later predictions using test data for which the "correct" output is known.

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[54] Meredith Broussard, *Artificial Unintelligence: How Computers Misunderstand the World* (Cambridge, MA: MIT Press, 2019), 96.

[55] Goodfellow, Bengio, and Courville, *Deep Learning*, 3.

[56] Broussard, *Artificial Unintelligence*, 9.

Even as supervised learning may inspire awe in its sophistication and implications for the future of AI, unsupervised learning is *the* machine learning paradigm that invites the most comparisons to human learning and creative processes, for a mixture of reasons not entirely justified by the realities of the technologies. In 2014, Ian Goodfellow et al. published a paper introducing Generative Adversarial Networks (GANs), an innovation in unsupervised learning wherein AIs ostensibly supervise themselves during the training process. In this framework, two models (a generative model and a discriminative model) are trained simultaneously *against* one another. Speaking on AI image generation, the *MIT Technology Review* characterizes GANs using art world concepts of authenticity and originality: "The magic of GANS lies in the rivalry between the two neural nets. It mimics the back-and-forth between a picture forger and an art detective who repeatedly try to outwit one another."[57] While the potential applications of GANs are innumerable — Goodfellow himself is especially interested in medical and green technology uses — creativity is a recurring thread in the appraisal of the innovation.[58] Only three years after his original publication on GANs, Goodfellow, who now works on the Google Brain team in Mountain View, delivered a presentation on the topic at the NIPS Workshop on ML for Creativity and Design. The slide deck suggests Goodfellow's interpretation of GANs as a technological representation of creativity in the purest sense; the presentation contains screen captures of the dictionary definitions of "creativity" and "imagination," followed by slides that repeat select phrases from these definitions next to diagrams outlining GANs framework, suggesting the compatibility between the conceptual and the technical. "Is imperfect mimicry originality?"

[57] Martin Giles, "The GANfather: The Man Who's given Machines the Gift of Imagination," *MIT Technology Review*, February 21, 2018.

[58] Gautham Santosh, "Interview with Ian Goodfellow — GAN's, Deep Learning Book," *Medium* (blog), July 22, 2020, https://medium.com/nybles/interview-with-ian-goodfellow-gans-deeplearning-book-1f8dfa9dacd4.

reads a later slide including a murky, AI-generated image of a cat meme.[59] GANs' claims to creativity stem from the lowered threshold of human intervention required to produce and refine outputs that appear tailored to their specific contexts. The lowered human involvement particularly invited projections about AI "dreaming," "hallucinating," or possessing an "imagination," including from Goodfellow himself. In an interview with Arthur Miller, Goodfellow says machines are indeed creative. Connecting this claim with his previous description of creativity from earlier in the interview (derived from his experience inventing GANs), it becomes clear how training data techniques are linked to models of creativity, especially in their inventors: "[The invention of GANs] was actually an extension of some earlier ideas. In a lot of creativity one has to build of experience and background knowledge."[60]

The Artist's Database: Combinatorial Creativity and AI

In 2012, Pixar Studios invited Austin Kleon to speak to its employees at its campus in San Francisco. Kleon, an author, poet, and self-described chronicler of "creativity in the digital age," was brought in to spread the lessons of his *New York Times* best-selling book *Steal Like an Artist: 10 Things Nobody Told You About Being Creative,* which has since spawned a constellation of ancillary print and digital publications, speaking engagements, and a TEDx talk. Though no transcript of his Pixar presentation exists, Kleon's message across all his work is consistent: the best artists in the fine arts, literature, music, and entertainment "steal" desirable components from other people's art as part of their creative processes. "Every new idea is just a mashup or a

[59] Ian J. Goodfellow, "GANs for Creativity and Design" (talk, NIPS Workshop on ML for Creativity and Design, Long Beach, CA, December 8, 2017).

[60] Miller, *The Artist in the Machine*, 89.

remix of one or more previous ideas," writes Kleon, in language seemingly inspired by fan-media-scholar Henry Jenkins' work on both internet cultural practices of mashup and remix – or Lawrence Lessig's refrain, "Creativity and innovation always builds on the past," used as an argument against totalitarian copyright regimes.[61] Ideas are never wholly original, but rather they comprise reinterpreted and repackaged elements from an array of source materials.

In order to become "better" at creative work, then, Kleon suggests reimagining the role of the artist as *collector* rather than inventor. He writes, "Your job [as an artist] is to collect good ideas. The more good ideas you collect, the more you can choose to be influenced by." Influence is understood as an affordance of a quantitatively large collection or database of good ideas. According to this logic, it seems unlikely Kleon would say this collection could ever be too big to manage or apply creatively to one's task.[62] The artist's collection process requires ruthless cultivation on the part of the artist, and should employ all tools at one's disposal to locate new sources to steal inspiration from. Search engines, with their vast databases and algorithm-driven search tools, are singled out as uniquely valuable for improving the collection process: "Look things up. Chase down every reference. Go deeper than anybody else — that's how you'll get ahead. Google everything. I mean everything. Google your dreams, Google your problems. Don't ask a question before you Google it…Don't worry about doing research. Just search."[63] If this process sounds exhausting, it is also excessive; at one point, Kleon suggests carrying a notepad at all times to record interesting tidbits from eavesdropping in public spaces.[64]

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[61] Austin Kleon, *Steal Like an Artist: 10 Things Nobody Told You About Being Creative* (New York: Workman Publishing Company, 2012), 10.; Lawrence Lessig, "Keynote: Free Culture" (lecture, Open Source Conference, Austin, TX, July 24, 2002).

[62] Kleon, *Steal Like an Artist*, 13–14.

[63] Kleon, 19–20.

[64] Kleon, 21.

While Kleon utilizes quotes and examples from some of the most renowned names in literature, science, and the classical arts to bolster the legitimacy and, subtly, the historic precedent for his approach, Kleon is offering a framework that responds directly to the current moment of AI-generated art, and seems determined to humanize and indirectly historicize the computational processes at work in these technologies. The valorization of "stealing" elements of art and repurposing them into new works, and the way the book seems eager to give creative workers permission to embrace this practice as creative and virtuous — these ideas certainly have renewed appeal and urgency in the developing conversations around text- and image-generators, wherein institutions are scrambling to reconcile the artistically, ethically, and even legally dubious use of internet-scraped, massive training data sets with claims that the creations produced by these machines should be considered "original." Kleon's *Steal Like an Artist* provides an artistic and cultural framework for conceptualizing influence as quantified in a database, and where connections can be made like nodes in a network.

While my interest in *Steal Like an Artist* relates to its commentary on theories of creativity deriving from current usage of text- and image-generators, that is not the only way the book's beliefs about artistry are connected to the incorporation of digital media into daily life. For the employees at Pixar, Kleon's characterization of "good" creative work as a calculated aggregation of ideas collected during a constant, broad-sweeping process of information harvesting likely sounded like something overhead in a nearby conference room, where Disney personnel were busy acquiring and hoarding entertainment assets and devising data collection methods for what would become Disney+, the streaming service that launched in 2019. From another angle, Kleon's cheerleading for an approach to (creative) problem-solving based in endless surveillance and data collection also exhibits many of the same assumptions and fetishized language as that

used by proponents of big data within private and government sectors, or even the National Security Agency (NSA). While the stakes in those sectors are certainly more threatening to civil liberties and, yes, to democracy, the subtle infiltration of the faith in constant collection and storage of information, however simplified or inconsistently applied, into creativity discourse raises questions about the stakes of this incorporation on art. Kleon offers something of an answer, though he stops short of teasing out the depressing implications for the future of artistry: "When you look at the world [according to the *Steal Like an Artist* perspective], you stop worrying about what's "good" and what's "bad" — there's only stuff worth stealing, and stuff that's not worth stealing."[65] When Kleon establishes a direct correlation between the number of logged "thefts" and the ability to be creative, collection becomes an end in and of itself. This correlation is reinforced by claims that a database, of course, can be endlessly and retrospectively useful to the collector; the value of the collection is indeterminate and variable, and therefore incalculable' the only sure way to add value is to add more "stuff": "Collect books," he goes on, "even if you don't plan on reading them right away. Nothing is more important than an unread library."[66] In this way, subscribers to the *Steal Like an Artist* system may be inclined to see Netflix's and other platforms' analytics arms race as high-tech, mathematical applications of the methods and philosophies of the artist-as-collector model; creativity is everywhere, at all times, in many forms — some just require different tools to collect, process, and harness for use.

Kleon's pop theorizing is only one of many examples of the growing ways computation — "as metaphor, method, and organizing frame," as David Golumbia would say — is structuring

[65] Kleon, 6.

[66] Kleon, 19–20.

artistic practice at the conceptual and cultural levels.[67] Aside from references to Google, Kleon does not connect the artist-as-collector model to AI, data training sets, or any other digital technologies. Nevertheless, his work evokes sensibilities based in digital media use: collection, curation, remix or mashup, surveillance, instrumentation, and memory/storage practices. Ironically, while *Steal Like an Artist* is mentioned here because of its commercial success, Kleon's ideas are more or less interchangeable with those of other writer-artists who believe it necessary and provocative to displace the privileged status of "originality" in assessments of art and culture, commonly through references to internet-based remix cultures. Writer and cultural critic Maria Popova offers what I consider this group's most refined critique in her concepts of "networked knowledge" and "combinational creativity." Popova explains these terms through a historical case study: the medieval tradition of the florilegium, or, in Latin "flower collection or gathering," in which extracts from various religious texts or other sources were compiled and organized into a single text, typically organized around a theme or doctrine. For Popova, florilegia, like those produced by Thomas of Ireland in the 14th century, are "commonly considered one of the earliest recorded examples of remix culture."[68] Such works exhibit the historical lineage of what she calls combinational creativity — "the idea that in order for us to truly create and contribute to the world, we have to be able to connect countless dots [representing the "networked" aspect of her ideas], to cross-pollinate ideas from a wealth of disciplines, to combine and recombine these pieces and build new castles."[69] Literary historians date such texts, including the related forms called "commonplace-books," to at least the 12th

[67] David Golumbia, *The Cultural Logic of Computation* (Cambridge, MA: Harvard University Press, 2009), 1.

[68] Maria Popova, "Networked Knowledge and Combinatorial Creativity," *The Marginalian* (blog), August 1, 2011, https://www.themarginalian.org/2011/08/01/networked-knowledge-combinatorial-creativity/.

[69] Popova, "Networked Knowledge and Combinatorial Creativity."

century; while some extant florilegia do seem to operate according to a consistent logic resembling "dot-connecting," often with explicit moral or pedagogical aims, others, according to historian Ann Moss, "were more like a continuous run of versified proverbs thrown together at random, underneath which one can occasionally catch faint echoes of some classical analogue."[70] Moss' work demonstrates how the ability to identify what even constitutes curation or "creative" combination is itself historically and culturally embedded. Yet, more interesting than Popova's argument that forms remixing, or what Kleon would call "stealing", have been essential to creation throughout history, is her observation that an emphasis on originality distracts one from "recognizing not only the absolute value of content but also its relational value, the value not just of information itself but also of information architecture, not just of content but also of content curation."[71] Following this thought to its logical end, Popova argues that the kind of collecting and personal database-making Kleon advocates, and which she gestures toward in the idea that combinational creativity, is a creative act on its own terms.

At the extreme end of the pop critiques of originality is filmmaker and speaker Kirby Ferguson's *Everything is a Remix* documentary series. The 4-part video series began in 2010 but has been continually updated (most recently in 2023) by Ferguson to include footage from contemporary films, new social media platforms like TikTok, and even an additional episode addressing AI creativity. Ferguson's slick, *Vox*-like production style argues the titular point in an entertaining but inevitably reductive manner that fails to distinguish between specific forms of cultural flow or references, including homage, cultural appropriation, plagiarism, citations, genre

[70] Ann Moss, "Ancient and Medieval Places," in *Printed Commonplace-Books and the Structuring of Renaissance Thought*, ed. Ann Moss (Oxford University Press, 1996), 27.

[71] Popova, "Networked Knowledge and Combinatorial Creativity."

conventions, and so on — instead categorizing everything as "remixing." Indeed, everything is a remix if the term is broadened enough.

The series "reveals how creativity happens" by drawing parallels between texts across the histories of music, art, dance, literature, and other forms of expression, including examples drawn from Hollywood media making and Silicon Valley.[72] Ferguson's vision of creativity is inseparable from remix, and this conviction informs his philosophy: "the collective achievements of art belong to everyone. They are as free as the air."[73] Despite its frustrating oversimplifications, Ferguson's series has resonated within the same audiences as Kleon and similar figures, who seem to have been conjured in backstage rituals at TEDx conferences. I suspect this partly has to do with its optimistic elevation of contemporary Hollywood blockbusters (especially the Marvel Cinematic Universe) as, actually, quite profound in the way their so-called "copying" is instead a form of creativity at "the core of human intelligence."[74] But more importantly, I argue the version of creativity on display in Ferguson's *Everything is a Remix* series has found success in the mainstream because it intentionally draws its evidence from both Hollywood artistry and Silicon Valley entrepreneurialism, in the process flattening and equating them. But even if they are superficially treated as one in the same by people like Ferguson, Hollywood's creativity and Silicon Valley's innovation do not co-exist equally in such discourse. For instance, even as the cultural tide has turned against AI's indiscriminate and unlicensed use of artists' work on the internet for training its systems, Ferguson seems to have

[72] "Homepage," Everything is a Remix, accessed July 21, 2023, https://www.everythingisaremix.info.

[73] Kirby Ferguson, "AI and Image Generation (Everything is a Remix Part 4)," March 7, 2023, video, https://www.youtube.com/watch?v=rswxcDyotXA.

[74] Kirby Ferguson, "Everything is a Remix (Complete Updated 2023 Edition)," March 21, 2023, video, https://www.youtube.com/watch?v=X9RYuvPCQUA.

deferred to a tech-friendly posture, amending his position on AI very little, saying "too many artists are getting overly possessive about what they believe is theirs" when objecting to their art training AI.[75] In Part 4 of the series, Ferguson seems unable to reconcile his assertion that copying is an essential starting point for all creativity with his simultaneous belief that AI is not creative. He can only offer an ineffective qualifier that "to be creative you need to have some awareness of what you're doing," which AIs, he says, do not. While his ideas may lack rigor, Ferguson's inflexibility on this point reflect the dependence of his and similar content creators' positions on AI on fickle changes in internet culture sentiment and not in features of these technologies.

For over two decades, advances in digital technologies have bolstered creativity theories like Kleon's "stealing," Popova's "networked knowledge" and "combinatorial creativity," and Ferguson's assertion that "everything is a remix." In many ways these ideas seem to represent pop manifestations of the scholarly and tech-world enthusiasm around Web 2.0, the open-source movement, and online creator cultures. Media scholar Henry Jenkins' work, particularly *Textual Poachers: Television Fans & Participatory Culture* (1992) and *Convergence Culture* (2006), exemplifies how access to the internet, video editing software, and other digital communications technologies are understood as increasing media fans' abilities to express their creativity by making mashups in zines, online forums, YouTube, and so on. Law professor Lawrence Lessig's *Remix: Making Art and Commerce Thrive in the Hybrid Economy* (2008) complements Jenkins' work to argue the legal frameworks of copyright law in the U.S. need to adjust to digital media's inherent tendency to copy. For Lessig, establishing the proper legal and social positions towards copying will directly influence the ability for a society or industry to be creative. "Copyright is,

[75] Kirby Ferguson, "Everything is a Remix."

in my view at least, critically important to a healthy culture," he writes in *Remix,* "Properly balanced, it is essential to inspiring certain forms of creativity…With it, at least properly balanced, we create the incentives to produce great new works that otherwise would not be produced."[76] Though I am skeptical that copyright laws can deterministically "inspire" creativity, I believe embracing the struggles and inadequacies of achieving balance between protections and allowances of copyright – rather than trying to avoid them via too-restrictive regulation or misguided tech solutions – can help reframe the current ambivalence around AI's "creative" status into an opportunity to spread new critical perspectives on internet-mediated culture.

But there are a few reasons why the current generation of large language models (LLMs) and text-to-image generators are undermining the basic values and assumptions of these creativity models. Framing creativity as a collection and synthesis/combination process risks merging human and machine-assisted forms of creativity in ways these figures suddenly want to resist for philosophical, ethical, artistic, and legal reasons. Ferguson's contradictory hand-wringing in the most recent entry to his *Everything is a Remix* series demonstrates how these figures struggle to rationalize these new conditions; explaining how an image in his video was produced with AI: "the simple version of what the AIs did is this: it studied countless images, without permission, then it emulated them and created its own versions. So yes, this is just like you. The entirety of this series demonstrates this is how we all create."[77] His only consolation after this admission is a sentimental appeal to exclusively human emotions of love, death, and parenthood. In any case, the issues surrounding the use of AI art seem to suggest the limits of

[76] Lawrence Lessig, *Remix: Making Art and Commerce Thrive in the Hybrid Economy*, 8/30/09 ed. (New York, NY: Penguin Books, 2009), xvi.

[77] Kirby Ferguson, "Everything is a Remix."

situating free-flowing art and remix culture at the center of popular conceptions of artistry in the age of AI. If AI is stealing, is it at least *stealing like an artist?*

A recent study of AI and machine learning reveals how creativity models like those described above can also draw some of their cultural authority in a positive way from their intersection with computer science. In *The Curse of Recursion: Training Data on Generated Data Makes Models Forget*, University of Cambridge researchers Ilia Shumailov et al. describe how the capabilities of widely-used AI systems including Variational Autoencoders, Gaussian Mixture Models, and Large Language Models are highly dependent on the quality of the training data sets used — quality, in this context, meaning primarily massive in size (often scraped from the internet) and derived from real-world interactions (not *synthetic,* or produced by other AI).[78] Chat-GPT, for context, was trained on data sets scraped from the internet prior to 2021. Since late 2022, the percentage of online content generated by LLMs alone has increased significantly, though exact figures are still being determined, if they can be at all. On the ground, various media and technology outlets are reporting the influx of AI content as a "flood" produced by "AI content farms."[79] Other outlets, like Buzzfeed and the technology news site CNET are announcing (i.e. rebranding red-handed confessions) the testing of AI to produce articles after being exposed for errors in copy.[80] According to Shumailov et al., when AI developers want to update their systems in the future, they will, theoretically, want to repeat the original training processes and scrape large portions of the internet. However, this scraped training data set will

[78] Ilia Shumailov et al., "The Curse of Recursion: Training on Generated Data Makes Models Forget" (arXiv preprint, May 31, 2023), http://arxiv.org/abs/2305.17493.

[79] Bernard Marr, "The Danger Of AI Content Farms," *Forbes*, May 16, 2023.

[80] Paul Farhi, "A News Site Used AI to Write Articles. It was a Journalistic Disaster," *Washington Post,* January 17, 2023.; Benjamin Mullin, "BuzzFeed Tries to Ride the A.I. Wave. Who's Hungry?," *New York Times*, May 23, 2023.

now contain data produced by AI systems — even the exact same system. The University of Cambridge researchers conducted experiments demonstrating how training AI with AI-produced data leads to what they call "model collapse," "a degenerative process affecting generations of learners generative models, where generated data end up polluting the training set of the next generation of models."[81]

The consequences of AIs undergoing model collapse as a result of flawed training data are described as such: AI's will "mis-perceive reality"; they will "start misinterpreting what they believe to be real, by reinforcing their own beliefs"; they will require "access to genuine human-generated content" to remain useful.[82] The growing attention to training data set quality in the wake of the AI boom raises questions about best practices for artistic "training," about how one would go about designing the ideal "training data" for producing good art and achieving an idealized form of creativity. The use by Shumailov et al. of such evocative, almost humanistic stakes in describing AI model collapse experimentally validates the techno-cultural mantra "Garbage In, Garbage Out," a phrase popularized in computing culture to describe the tendency of low-quality input data to the production of low-quality output. The consideration of one's own "training data set" and its impact on one's creative output can be found in each of the creative theories described above, which emphasize the assembly of a personal data set of cultural influences. Referring briefly back to Popova, she offers this practical advice for embracing and achieving combinatorial creativity: "We can, however, optimize our minds for combinatorial creativity — by enriching our mental pool of resources with diverse, eclectic, cross-disciplinary pieces which [sic] to fuse together into new combinations. For creativity is a lot like LEGO — if

[81] Shumailov et al., "The Curse of Recursion," 3.

[82] Ibid.

we only have a few bricks of one shape, size, and color, what we build would end up dreadfully drab and uniform; but if we equip ourselves with a bag of colorful bricks of various shapes and sizes, the imaginative temples we build might appear to an onlooker to have been inspired by a "ray of grace.""[83] Aside from the instrumentalization of artistic and cultural diversity in her "colorful bricks" metaphor, Popova also makes the curious point that one's creative output "might appear to an onlooker to have been inspired by" a large set of influences if one adequately designs their mental resources, as opposed to the "imaginative temples" deriving from them genuinely. The distinction between the reality of the creative process (input) and the appearance of it (output) draws attention to the way creativity models evoke, even unintentionally, technological processes in establishing their logic and validity. Compare Popova's advice about designing one's mental resources to the following comment by *New York Times* tech reporter Kevin Roose. Roose is responding to the high-profile study by Shumailov et al. referred to above in the *NYT* podcast *Hard Fork:* "I actually found something strangely hopeful and almost optimistic about [the study]…in some ways, the robots need us, right? They need human creativity to be able to keep producing good answers…And they really need humans to just create high quality information for them to ingest, but not just high-quality information, but interesting, and unexpected, and out of distribution information [computer science phrase] that they can ingest that will make them actually more robust."[84]

The artist-as-collector model, the combinatorial creativity and networked knowledge models, and the "everything is a remix" model all imagine creativity deriving from (preferably) large, eclectic "data sets" within an individual creative person, collected over the course of one's

[83] Maria Popova, "Combinatorial Creativity and the Myth of Originality," *Smithsonian Magazine*, June 6, 2012.

[84] Kevin Roose and Casey Newton, "Is A.I. Poisoning Itself?, Billionaire Cage Fight and Cooking With ChatGPT," *New York Times*, June 30, 2023.

daily experiences and exposure to art and the world. The mandate in these creative models, either implicit or offered as direct advice, is that one should take on a conscious process of designing and optimizing this data set as part of one's artistic process, typically by consuming more media and continually refining one's taste, which acts as the unconscious processor of the database. Variations on this idea, some more overtly influenced by digital technologies than others, appear across the art self-help paraindustry and even in more critical considerations of creativity from within academia. In his book *The Artist in the Machine: The World of AI-Powered Creativity*, Professor of History and Philosophy of Science Arthur I. Miller includes "Beg, Borrow, or Steal Great Ideas" as one of the "Seven Hallmarks of Creativity," which involves an essential process of idea "accumulation."[85] While Miller's account is written from 2019, before the release of Chat-GPT or popular text-to-image generators like Dall-E, Miller's arguments are drafted alongside AI researchers and artists, and his ideas about creativity appear to adopt an understanding of the mind as, at various times, database, data set, information processor, algorithm, and other computer components. "But "theft" is never mere plagiarism," Miller writes, in a romantic reflection on human creativity that doubles as an interpretation of AI's information processing characteristics, "What [artists] see or hear soon becomes theirs, woven into their own pattern of ideas and elevator to a level far beyond the original…[The ideas of others] are stored in our memory banks and over time become our own."[86]

Here, too, beliefs about artistic best practices intersect with emerging understandings of the science of machine learning. The growing body of research comparing the social (human) and machine learning processes shed light on this intersection. Marion Fourcade and Fleur Johns,

[85] Miller, *The Artist in the Machine*, 13.

[86] Ibid.

four example, offer multiple terms useful for comparing these processes, demonstrating how these concepts can be mapped onto mainstream creativity models, and, critically, understanding how social learning in the age of the internet is inextricably linked with search engines, algorithms, and machine learning systems. In "Loops, Ladders and Links: The Recursivity of Social and Machine Learning," Fourcade and Fleur link social and machine learning by their respective reliance on "a searching disposition" based in "data hunger," ultimately allowing for "meaning accretion," a process in which the collection of data (social or computational) informs future meaning-making processes and behavior. "Social processes of impression formation," they write, "offer a good illustration of how social learning depends on accreting data at volume, irrespective of the value of any particular datum."[87] Elsewhere, they describe social learning based in "incremental build-up of a variegated mass of data." Though Fourcade's and Fleur's objective is not to "optimize" the process of social learning, which includes forms of socially situated creative expression, this clinical description of social learning tracks with the simplified self-help applications of these ideas in creative self-development; (for instance, recall *Steal Like an Artist'*s indifference to perceived quality of "thefts" in favor of a utilitarian, cumulative perspective ("only stuff worth stealing" or not worth stealing).[88] Machine learning, according to Fourcade and Fleur, "produces insight in a somewhat comparable way" that motivates "data hunger," wherein "access to data in enough volume [which must be increased for future development] and variety must be ensured to enable a particular learner-model combination to attain desired accuracy and confidence levels."[89]

[87] Marion Fourcade and Fleur Johns, "Loops, Ladders and Links: The Recursivity of Social and Machine Learning," *Theory and Society* 49, no. 5–6 (2020): 803–32.

[88] Kleon, *Steal Like an Artist*, 6.

[89] Fourcade and Johns, "Loops, Ladders and Links."

People, too, face this data hunger through daily interaction with digital technologies designed to exploit their desires to learn, improve, and become more socially habituated. In describing the relationship between digital technologies and the process of self-formation, Fourcade and Fleur gesture toward the culture of "technologies of the self" and self-improvement that produce the creativity models above. It is easy to image substituting their examples of daily experience "data" with art-oriented ones: "When one is learning from a machine, and in the process of making oneself learnable by it, mundane activities undergo a subtle redefinition. Hydrating regularly or taking a stroll are not only imperatives to be followed or coerced into. Their actual phenomenology morphs into the practice of feeding or assembling longitudinal databases and keeping track of one's performance."[90] As do the authors of popular creativity models, then, digital technologies leverage the logic of their systems and what is known to be "good" for them as a means to intervene in the outlook towards collecting experiences and information as a form of personal data.

The discourse around AI model collapse and the "curse of recursion" runs parallel to political and cultural appeals to avoid "filter bubbles" in one's (mostly digital) life. Both machines and people, by these cultural logics, risk hampering their creative, social, and analytical outputs if deprived of that ever-accumulating source of eclectic data "inputs." In scrutinizing the relationship between AI art generation performance and these technologies' training data sets — either in ongoing discussions over the copyright issues, or in explanations of their design — subjective questions about the workings of artistic and cultural influence on artistic expression are being reframed as technical processes.

[90] Fourcade and Johns, "Loops, Ladders, and Links."

The engineering task of collecting ideal training data for art-producing AI has a corollary discussion in the social realms. As artists come forward to assert their right to control whether their works are used to train AI, discussions that begin with appeals to copyright law and fair use policies quickly turn to cultural questions wondering what it means for art to be "included" in the data that will train AI now and into the future. There is an interesting way these conversations gradually move toward conflating AI training data with culture itself, like a techno-cultural canon. This digital-era ideological tick has been thoroughly explored by Wendy Chun, who explains how computers serve as "mediums of power" through their technical affordances and symbolic meanings.[91] Her articulation of digital media's essential "vaporiness" provides an important context for understanding how the mystique of artistic influence is ripe for a merger with equally vapory but, for this reason, extremely powerful beliefs about memory, storage, and Chun's notions of "repetition" and "transmission" in AI training.[92] The associations between AI training data and the cultural, historical, etc. canon do more to reveal commentators' awe at AI technologies and their presumed integral role in shaping humanity's future. They also present a framework for understanding artistic influence and legacy not as a product of a specific cultural or historical process but rather as a matter of data storage and memory.

AI training data is thus amassing its own value system that favors the interests (profits) and values of tech companies, whose systems only stand to benefit from access to more data. These companies benefit additionally from cultural pressure to promote free-flowing information, including and especially art, whether in the spirit of techno-utopianism or in the bastardization of free speech idealism promoted by tech leaders like Elon Musk. While entertainment industry

[91] Wendy Hui Kyong Chun, *Programmed Visions: Software and Memory* (Cambridge, MA: MIT Press, 2013), 2.

[92] Chun, *Programmed Visions,* 21.

giants are expected to push for hasty, effective copyright law updates to address use of their intellectual property in AI systems, artists who do so risk being labeled "misguided," as they are in a piece on AI art by Kevin Kelly for *Wired.* "[Artists] might fear that a big corporation will make money off of their work, and their contribution won't be compensated," writes Kelly, "But we don't compensate human artists for their influence on other human artists…The "tax" that successful artists pay for their success is their unpaid influence on the success of others."[93] This logic filters into an emerging common sense that leverages powerful, widespread beliefs in the power of art in service of AI developers. Kelly offers a distillation of this thinking and the way it weaponizes artistic influence against artists in a passage worthy of full quotation: "The algorithms [comprising AI] are exposed to 6 billion images with attendant text. If you are not an influential artist, removing your work makes zero difference. A generated picture [by AI tools] will look exactly the same without your work in the training set. But even if you *are* an influential artists, removing your images still won't matter. Because your style has affected the work of others — the definition of influence — your influence will remain even if your images are removed…But in the next decade…we'll teach even more powerful AI image generators how to paint by showing them thousands of carefully curated, highly selected images of existing art, and when this point comes, artists of all backgrounds will be fighting one another to be included in the training set. If an artist is in the main pool, their influence will be shared and felt by all, while those not included must overcome the primary obstacle for any artist: not piracy, but obscurity."[94]

[93] Mikael Thalen, "Artists Fed up with AI-Image Generators Use Mickey Mouse to Goad Copyright Lawsuits," *Daily Dot*, December 16, 2022.; Kelly, "Engines of Wow."

[94] Kelly, "Engines of Wow," 44.

In this antagonistic framework, wherein training data sets embody a techno-cultural canon and promise a future life for one's ideas (with apparently no alternative paths available) — and wherein, as described above, stealing, theft and combination are increasingly positioned in the digital age as essential, time-worn characteristics of human creativity — any artist or industry worker who takes legitimate issue with the indiscriminate use of data scraping for machine learning purposes faces the unfair threat of being labeled inauthentic, uninformed, or anti-culture.

Given that all computational processes obey the laws of physics, it is theoretically possible to track the path of data from training set to its effect on output. As Meredith Broussard points out, "For every AI system that exists today, there is a logical explanation for how it works. Understanding the computational logic can demystify AI, just like dismantling a computer helps to demystify hardware."[95] But the (to date) impracticality of completely delineating the footprint of an individual artist's work in AI output makes it more complicated to use AI training data specifically to demystify artistic influence or creativity. In order to be rendered computationally through AI, the mechanisms of artistic influence are increasingly imagined as software running on top of culture. "The clarity offered by software as metaphor," as Chun writes, stems from its ability to represent "everything we believe is invisible yet generates visible effects, from genetics to the invisible hand of the market, from ideology to culture."[96] In AI creativity discourse, the imagined training data sets that will determine the future of art become focal points for projections about the elevation of art through its processing by machines, or, as with Kelly,

[95] Broussard, *Artificial Unintelligence*, 33.

[96] Chun, *Programmed Visions*, 2.

economic rationalizing that suggests if influence cannot be quantified in AI it cannot be compensated.

The prospect of an "AI canon," arising out of both the creation of training data sets and their algorithmic outputs, recasts the terms and stakes of previous research on canon formation and the techno-social constructs that shape what media gets included, celebrated, and remembered. Within media studies, canon formation is an ever-shifting, socially and historically constructed process. For the purposes of study, I am using "canon" to refer to the western, idealized conception of "the important works" considered central to an artistic tradition. Literary critic Harold Bloom provides a useful analysis of the western model of canon formation. His writing on the subject is defiant, rigid, politically charged, and intolerant, particularly towards multiculturalism and feminism. In other words, Bloom's rhetoric should be seen as embodying the domination mentality characteristic of the western canon in its struggle to maintain authority by exclusion and consolidation; The construction of the canon, in this mode, is a process deriving from qualities inherent to the texts themselves. For example, Bloom describes canonical texts as possessing "mark[s] of originality" that reveal themselves to observant readers via a sense of "strangeness."[97] Bloom's theory of the "anxiety of influence," elaborated in the titular book from 1973, describes the relationship between the canon and influence as one in which the canon, comprised of works that consciously influence current artists, exerts a pressure on these artists and thus structures their current works. Moreover, the anxiety of influence grows in proportion to the canon's accumulation of voices over time, introducing a quantitative dimension to this dynamic that has implications for the increasing scale of training data sets that include artistic works; "Strong literature," he writes, "agnostic whether it wants to be or not, cannot be

[97] Harold Bloom, *The Western Canon: The Books and School of the Ages* (Harcourt Brace & Co., 1994), 4.

detached from its anxieties about the works that possess priority and authority in regard to it. Though most critics resist understanding the process of literary influence or try to idealize those processes as wholly generous and benign, the dark truths of competition and contamination continue to grow stronger as canonical history lengthens in time."[98]

Kelly's claim that "artists of all backgrounds will be fighting one another to be included" in training data as AI becomes more sophisticated and widespread, or else face insurmountable "obscurity." This argument finds support in a variety of critiques from science and technology sectors that belittle artists' concerns about copyright or remuneration as short-sighted and futile resistance to the inevitable future, which invoke 20th century mathematician John von Neumann's concept of technological singularity (when humans are eventually overtaken by advanced artificial intelligence).[99] The concept was popularized and made more threatening by classic sci-fi writers like Vernor Vinge, who in addition to his AI fiction produced an influential essay on the topic in 1993.[100] Tech companies have continually exploited the idea that art or ideas "belong to everyone," to the extent that it does not result in undesirable material consequences for their businesses. Access to more data means more flexibility in constructing large training sets for machine learning, which results in more efficient and accurate algorithms. Attempts to legitimize training data as a determinative force for the future life of art or as a manifestation of cultural influence is, at this time, merely a hopeful forecast for the integration of AI into daily life.

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[98] Bloom, *The Western Canon,* 11.

[99] Murray Shanahan, *The Technological Singularity* (Cambridge, MA: MIT Press, 2015).

[100] Vernor Vinge, "The Coming Technological Singularity: How to Survive in the Post-Human Era," (paper presented at Vision-21 Symposium, NASA Lewis Research Center, Cleveland, OH, March 30-31, 1993), https://edoras.sdsu.edu/~vinge/misc/singularity.html.

Kelly's self-assurance that artists who fight AI today will one day be sorry is also based in the conception of AI training data as a canon-like force which makes literal the collection and preservation of cultural works. This canonical function does not make obvious how it operates according to judgements of "taste" or "quality" based on a text's internal qualities, but rather appears to perform only the preservation aspect of a canon. This construction of training data's cultural significance supersedes the complex economic, legal, and ethical debates still to be had about AI in favor of a binary where a text, figure or culture is either "in" or "out," where "in" is definitive and universally desirable. (Not to mention, of all the shortcomings of Kelly's framing, it ignores the centuries of evidence from the business and art worlds wherein strategic inaccessibility, strict brand management, and ephemerality have successfully worked in favor of an artist's or work's influence and social relevance.) In 1985's "The Politics of Film Canons", Janet Staiger argued that despite the inherent reductionism and the "limitations [canons] impose on our understandings" of art, "an escape from canon formation will be difficult to achieve."[101] This seems even more the case as the tendency to regard AI training data as an essential repository for the "relevant" ideas and works will only increase, particularly as it becomes more manageable and efficient to update AI systems more frequently and using larger data sets. This makes AI training data a lightning rod for reductive re-interpretations of cultural influence that merit ongoing vigilance from media scholars.

Media scholar Barbara Klinger's work on the cinema canon in her critical "biography" of *Casablanca* (1942) provides some important concepts and terminology for defining how AI training data is being imagined as a similar site for cultural selection and preservation. Analyzing the ideologies of film canon formation, Klinger makes a distinction between two opposing

[101] Janet Staiger, "The Politics of Film Canons," *Cinema Journal* 24, no. 3 (1985): 4–23.

schools of thought: first, the traditionalist school that includes Bloom and which attributes a text's endurance to its intrinsic artistic qualities. This school, in which aesthetic theory is the operative framework, "sees the classic's self-determining and self-renewing powers as able to masterfully navigate historical change."[102] The second school, which includes Barbara Herrnstein Smith and Howard Becker, argues for a social constructionist model of canon formation that believes classics come to be through a complex, negotiated process of circulation that creates what is ultimately an illusory self-determination. "Hence, an orthodoxy of interpretation and evaluation arising from the cultural reproduction of value penetrates the classic's reception," writes Klinger, "providing the guise of a stable, enduring canonical identity...The more the classic continues to circulate, the more its inclusion in the canon seems preordained, justified."[103] This self-fulfilling quality of classic work relies on the common sense belief that if a work has endured culturally — if it has "stood the test of time" as the saying goes — then it must have some legitimacy as an important or even great work. Klinger points to Michael Patrick Allen and Anne E. Lincoln's notion of "retrospective cultural consecration" to elaborate how a media-inflected form of adaptation studies (in the Darwinian sense) bolster such understandings of canonical works in the face of increasing competition in the marketplace: "Older films, given their datedness, potential failure to suit contemporary aesthetic standards and tastes, and need to compete in an ever-expanding field of media choices, are precariously balanced on the knife's edge of being forgotten…Since forgetting is such a powerful option, what is selected and remembered attains special value."[104] Because they allow for quicker access

[102] Klinger, *Immortal Films: Casablanca and the Afterlife of a Hollywood Classic* (Oakland, CA: University of California Press, 2022), 16.

[103] Klinger, *Immortal Films,* 17.

[104] Allen and Lincoln, qtd in Klinger, *Immortal Films,* 19.

to large sources of media and information, digital technologies are often targeted for intensifying such forces of forgetfulness.[105] A new wave of mindfulness specifically meant to combat technology's acceleration of life and alleged influence on attention spans has taken over certain tech subcultures looking to move more thoughtfully and slowly through the tech landscape.[106] This social context allows the self-fulfilling rationality of cultural endurance — if an artistic work has adapted to the innumerable existential threats over its lifetime (including our attention spans), it must have import — to resonate even more within AI art discourse.

If AI training data inclusion indicates artistic influence, the systems' algorithms represent the way influence exerts its presence. This is where the metaphor of training data as canon distinguishes itself from the "sorting, classifying and hierarchizing of people, places, objects and ideas" in Ted Striphas' "algorithmic culture."[107] The "work of culture" described by Striphas is not seen as delegated to the machine in the AI context, rather it is imagined to have *already been done* before conversion into training data. The same conceptualizations that lead to overestimations of Big Data's truth and power — namely, as Lisa Gitelman describes, the combined effect of data's abstract and aggregative qualities — also contribute to misperceptions that the data sets supporting AI art generators are not scrubbed or limited in any ways beyond those barriers imposed by short-sighted, stubborn artists.[108] In this way an AI canon appears less constructed than the traditional canon and can be seen as more unproblematically reflective of a culture by virtue of its basis in enormous, "raw" internet scrapes. Even as the techno-optimist

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[105] Johann Hari, "Your Attention Didn't Collapse. It Was Stolen," *Observer*, January 2, 2022.

[106] Cal Newport, *Digital Minimalism: Choosing a Focused Life in a Noisy World* (New York: Portfolio, 2019).

[107] Ted Striphas, "Algorithmic Culture," *European Journal of Cultural Studies* 18, no. 4–5 (August 1, 2015): 395–412.

[108] Gitelman, *"Raw Data" Is an Oxymoron*, 6–8.

Kelly acknowledges that "it's impossible to unravel our influences when we create something. It is likewise impossible to unravel the strands of influence in the AI image universe," AI can provide verifiable evidence of influence by drawing from its training data and reproducing elements of a given artist's style or specific iconography.[109] This sentiment is exemplified in the trend of internet users producing trailers for *Star Wars, Harry Potter,* and other film franchises done in the formal style of Wes Anderson (or rather, what is recognizable as being Wes Anderson-y).[110] Even if these overdone gags simplify the director's aesthetic tendencies, the ability for AI to produce Wes-Anderson-inspired images is regarded as clear-cut evidence of the director's influence in film culture.

The seductive misidentification of AI training data with a kind of authoritative canon, which both represents the artistic footprint of a work and signifies its potential to influence other art into the future, is likewise supported by incomplete understandings of AI training data, as well as enduring beliefs that the internet contains the most significant aspects of culture. The characterization of training data sets as embedded in artistic culture in popular science and technology discourse signifies one component of the formation what Shyon Baumann calls a "legitimation framework."[111] Baumann's *Hollywood Highbrow* is a historical study investigating how Hollywood films came to be seen as art. Baumann describes the complex and continuous interactions between social, economic, and intellectual forces required to achieve a transformative perceptual shift that grants an object "artistic status"; this includes "opportunity

[109] Kelly, "Engines of Wow," 44.

[110] Stuart Heritage, "Please Stop Using AI to Make Wes Anderson Parodies," *Guardian,* May 11, 2023.

[111] Shyon Baumann, *Hollywood Highbrow: From Entertainment to Art* (Princeton, NJ: Princeton University Press, 2007), 18.

space, institutionalized resources and activities, and intellectualizing discourse."[112] The development of perceptions about AI and its role in art and media cultures likewise involve a mixture of forces from taste culture, institutional politics, and intellectual trends.

Even as legal and ethical debates continue regarding violations of copyright, privacy, civil liberties and so on within AI training data, in the AI art context, training data is being continually situated as an emerging site of cultural endurance. In her discussion of film canons, Klinger refers to the various exhibition contexts required to sustain a film's long-term influence as the "architectures of transformation necessary for textual survival."[113] Tracking the path of media AI training data seems a worthy pursuit for scholars trying to understand how cultural processes are being mapped within technological structures: Klinger's emphasis on adaptation and "mutation" as essential to a film's longevity reimagines and even dulls AI's existential threat to creative workers. Films that endure, for Klinger, exemplify "the inherent changeability of the film body," "filmic shape-shifting," and undergo radical recontextualizing via "a mass culture dedicated to the serial repetition and viral travel of its artifacts."[114] Ultimately, the reframing of training data and its processing through AI as a metaphor for artistic influence, or as a cultural canon, or as a model for the way influence operates in culture, should raise suspicion and concern. Wendy Chun's warning about software as a metaphor is an essential influence on this critique.[115] She makes clear why this insight is misleading and dangerous: "Software is, or should be, a notoriously difficult concept — the clarity offered by software should make us pause, because

[112] Baumann, *Hollywood Highbrow,* 18.

[113] Klinger, *Immortal Films*, 12–13.

[114] Ibid.

[115] Irony acknowledged.

software also engenders a profound ignorance. Who really knows what lurks behind our smiling interfaces, behind the objects we click and manipulate? Who completely understands what one's computer is doing at any given moment? Software as metaphor for metaphor troubles the usual functioning of metaphor, that is, the clarification of an unknown concept through a known one. For, if software illuminates an unknown, it does so through an unknowable (software)."[116]

There is a close relationship between this chapter's argument that training data serves as a structuring metaphor for AI and individual creativity and scholarship on databases, their role in shaping information, and even their aesthetic values. There are echoes of Lev Manovich's fetishization of the database – for instance, as "the centre of the creative process in the computer age" – in interpretations of AI's processes.[117] These technologies invite commentators' to similarly draw parallels between databases and the workings of the human brain; writing on the semiotics of databases, Manovich has written that "new media makes explicit the psychological processes involved in cultural communication…[including a] shift from creation to selection, which externalizes and codifies the database of cultural elements existing in the creators' mind."[118] The slippage between database/training data and their specific functions in popular understandings of AI creativity is expressed in speculations about the limits of AI "imagination," given these systems' exclusive reliance on the information provided to them in each batch update. "A key limit on AI tech like ChatGPT," writes *The Wrap* reporters Jose Alejandro Bastidas and Umberto Gonzalez, "is the training sets it uses, which are massive collections of data — everything from photo libraries to Wikipedia entries. *New* worlds, *new* ideas, *new* videos

[116] Wendy Chun, et al., "Software Studies, Revisited. A Roundtable on the Software Studies Series at MIT Press," *Computational Culture* 9 (May 9, 2022, as preprint), http://computationalculture.net/software-studies-revisited/.

[117] Lev Manovich, "Database as Symbolic Form," *Convergence* 5, no. 2 (June 1, 1999): 86.

[118] Manovich, "Database as Symbolic Form," 90.

— the stuff of Hollywood, in other words — are by definition outside its scope."[119] Because the way AI text- and image- generators actually manage, categorize, access, and utilize information from their training data sets is largely hidden from average users, there is a tendency for commentators to conceptualize training data as a database, and its influence on output a result of the AI system itself acting as a kind of database management system (DBMS). Computer scientists Hector Garcia-Molina, Jeffrey Ullman, and Jennifer Widom provide a technical definition of the database that gives equal importance to both the information stored and the means of accessing and managing this information (a DBMS). A database management system is expected to allow users to create new databases from the existing one, determine a given database's organizing logic or schema, query the data, and store and preserve large amounts of data for future recovery.[120] One of the pleasures of using AI text- and image- generators is trying to reverse-engineer the sources that influenced the final product, in a process that imagines how AI utilized its training data.

Digital media artist and scholar Victoria Vesna's has previously written on the aesthetic potential of databases for artists. This work is a useful reference point for considering how technical systems and their logics can influence artistic expression. Vesna's work on "database aesthetics" is interested in "how practicing artists think in relation to databases" and in making a prescient case for artists to become directly involved in the design of information systems that shape access to their works and other social data.[121] Vesna highlights and provides support for a

[119] Bastidas and Gonzalez, "Chatbots Flip the Script: For Screenwriters, AI's Evolution Brings New Tools and New Fears."

[120] Hector Garcia-Molina, Jeffrey Ullman, and Jennifer Widom, *Database Systems: The Complete Book*, 2nd ed. (Upper Saddle River, N.J: Pearson, 2008), 1–2.

[121] Victoria Vesna, ed., *Database Aesthetics: Art in the Age of Information Overflow* (Minneapolis, MN: University of Minnesota Press, 2007), xiv.

variety of digital artists who use databases as ways to critique institutions and reckon with the increasing data-fication of everyday life. While she does not discuss AI outright, Vesna does acknowledge an anxiety among artists about becoming swallowed by databases and being unable to defend themselves from these systems' processes in the future: "Another source of fear for artists confronting the new technologies is the integration of individual artists into the context of other works or the creation of metaworks. Of course, this is not a fear for those who have taken on a broader view of what "originality" might mean."[122] Her final qualifier about originality evokes similar suggestions by the pop creativity theorists described above. Positioning generative AI as a form of database aesthetics can be a productive way of challenging or otherwise interrogating assessments of AI that see it as an advanced form of database management software, both by motivating more in-depth understandings of their actual functions, and by drawing attention to the ways these systems (and their datasets) elude the modularity and remix characteristics of databases and other information structures probed for aesthetic import.

[122] Vesna, *Database Aesthetics,* xiii.

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