

ALLOW ME TO INTRODUCE YOU TO: AN ARGUMENT FOR THE EFFICACY OF
PORTRAIT FILMMAKING IN SCIENCE COMMUNICATION.

by

Nicholas Scott Hill

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DEDICATION

I would like to dedicate this paper and the film that accompanies it to my family, especially my mother Joann Hill, for their endless support and encouragement in completing this degree.

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ABSTRACT

Media influences how we perceive the world. Reductive portrayals of scientists in literature and motion pictures have contributed to negative connotations of scientists and scientific fields. In a culture of personality where a person's credentials are linked to their likability, breaking these connotations is crucial. If the goal of science communication in documentary is to inform the public about scientific principles, research, or new discoveries; using portrait filmmaking can assist in meeting that end. Effective use of portraiture filmmaking in science communication can help show that scientists are much more complex than some media have portrayed them. They are people, with real passion about the field they are exploring as well as for other aspects of life. When a filmmaker shows a scientist as a character with more depth than just their profession, they can create empathy and connection between viewers and scientists. If viewers can relate to the scientists, they may be more receptive to the field or the research the scientists are passionate about. In this paper, I suggest that the use of portraiture filmmaking in science communication is an effective tool to use in showing the public that scientists are relatable people, not reductive representations of their profession.

INTRODUCTION

Media often portrays scientists and mathematicians undesirably as individuals on the fringe of society. For centuries popular media has relied on cliches and stereotypes to assign character traits to those who excel in maths and sciences. Victor Frankenstein lives sequestered from his village and sought to animate a monster from the body parts of various corpses. *A Beautiful Mind*, *Good Will Hunting*, and *Proof* portray mathematicians as, at best, unrelatable nerdy white males. *The Big Bang Theory* has four male protagonists who start the series as highly intelligent yet deeply flawed individuals. One suffers from childhood trauma. One is utterly unaccustomed to societal norms and condescending to nearly every other character in the show. One is hyper-intimidated by women, and another hyper-sexualizes and objectifies women. Even in animated children's shows, Dexter of *Dexter's Laboratory* is wildly condescending and dismissive of his sister, and his parents are utterly clueless of their son's activities.

Suppose these negative portrayals of highly educated individuals are the predominant references a lay person has for people who work in maths and sciences. If a lay person cannot relate to the scientist, they are unlikely to engage with the scientists' research. Moreover, it is possible to associate the mathematician or scientist's negative perception with the fields themselves, resulting in disdain for those fields of research. In 2010, Serkan Hekimoglu and Emily Kittrell published a study, "Challenging Students' Beliefs about Mathematics: The Use of Documentary to Alter Perceptions of Efficacy." In the study, they sought to challenge beliefs that students have formed before college about mathematics. One student in the study cited *A Beautiful Mind* as an example to

support “her belief in a *mathematics gene* – people are born either ‘good at math or not.’ She concluded her remarks by stating she was, ‘not a math person and would never be good at mathematics no matter how hard’ she tried” (Hekimoglu, Kittrell pg. 303). As part of their 2010 study, the researchers used the documentary *The Proof* to “create *cognitive disequilibria*, confronting students with experiences and information inconsistent with their prior knowledge or beliefs” (Hekimoglu and Kittrell 305). In doing so, the researchers hoped to change these students' beliefs about mathematics and learning maths. As part of their methods, students watched the documentary at the beginning of a semester and submitted anonymous reflection papers based on the film. Before watching the documentary, students were informed that the intent of viewing the film was to “illustrate how mathematicians do mathematics” (307). By providing a portrait of a mathematician, “the film put a human face on a subject which for too long has been regarded as difficult, cold, abstract, and rather frightening” (308). Student comments ranged from admitting they did not know what mathematicians did to commenting on the passion they have for their field to this comment on page 309:

Mathematicians are almost always portrayed as unattractive and socially inept white men working in unglamorous careers. I am very surprised that mathematicians actually enjoyed their job and I am jealous of their dedication and passion for mathematics.

If scientists break the negative stereotypes assigned to them by the media - if they can sow a perception of a regular person who is passionate about a subject and who has devoted their time to becoming an expert on that subject, it will be easier to obtain a

voice to disseminate their research. If a person feels they can relate to the character on screen, they are likely to listen to what the character has to say. Portraiture in Film is a method that can be used to share information while humanizing the scientist and should be considered a valuable tool in disseminating scientific research.

Portraiture has been a mode of representation in the arts for centuries. Many famous oil paintings throughout history are portraits. Artists spent hours or even days capturing the likeness of a subject in order to represent something important about that subject. Biographies are portraitures in literature where an author learns about their subject to write the manuscript. The advent of photography in the mid-1800s allowed for newer and quicker methods of portraiture. Film is essentially a sequence of thousands of moving photos, and portraiture filmmaking is an amalgamation of these mediums. The subject will sit for an extended period during the filming of an interview, where the filmmaker learns about their subject and asks questions to produce a response that shows who the subject is. Taking this interview, the filmmaker creates an artful rendition of who the subject is by using a combination of the subject's own words via interview and images or sequences that represent the subject. While a portrait as a stand-alone film may have little appeal to broad audiences, utilizing portrait filmmaking is an effective way to have viewers connect and relate to a character in a narrative. Portraiture allows the filmmaker to show audiences who their subject is and, in doing so, they can begin to break down the negative stereotypes popular media have created.

In this paper, I argue that portraiture filmmaking in science communication media and science-themed documentaries can efficiently convey scientific principles. I will

examine two feature films, *Particle Fever* and *An Inconvenient Truth* as well as my short Film *A Happy Distraction* to show how the connection between filmmaker and subject can be beneficial to create a story that increases interest in a field. I argue that seeing the scientists at CERN in *Particle Fever* as people rather than just as their professions made the film memorable and contributed to making complex material easier to understand. Counter to this, *An Inconvenient Truth* is a film about essential data, but it is largely centered around a climate change presentation that Al Gore has delivered throughout his career and does not attempt to connect with broader audiences. Finally, I will discuss how these principles shaped the making of my MFA Thesis film, *A Happy Distraction*, and defend the choices I made while filming and editing the piece.

AN INCONVENIENT DOCUMENTARY

Davis Guggenheim's 2006 film, *An Inconvenient Truth*, is essentially a 90-minute PowerPoint presentation delivered by Al Gore intercut with footage of Gore compiling the presentation. According to the synopsis of the film found on the website AlGore.com:

Director Davis Guggenheim eloquently weaves the science of global warming with Al Gore's personal history and lifelong commitment to reversing the effects of global climate change in the most talked-about documentary at Sundance. An audience and critical favorite, *An Inconvenient Truth* makes the compelling case that global warming is real, man-made, and its effects will be cataclysmic if we don't act now. Gore presents a wide array of facts and information in a thoughtful and compelling way: often humorous, frequently emotional, always fascinating. In the end, *An Inconvenient Truth* accomplishes what all great films should: it leaves the viewer shaken, involved and inspired.

The data presented in this film does indicate that global warming is real and human-made. While Guggenheim does incorporate much of Al Gore's personal history in a portrait style of filmmaking interwoven with data presentation, this film does not accomplish the end goal of leaving the viewer shaken, involved, and inspired. There is a stark overload of data presented in this film presented by Mr. Gore, who certainly has accomplished a lot in climate change research; however, the viewer never learns what credentials Mr. Gore has to present them. At two minutes and twenty seconds into the film, he introduces himself as such, "I am Al Gore; I used to be the next president of the United States of America" (*An Inconvenient Truth*). It is an attempt at humor that falls flat and serves to allow viewers to politicize all proceeding statements from this point on. While other sequences that present Mr. Gore's personal history accomplish a sense of portraiture filmmaking, because the viewer never gets a grasp of why Al Gore is the person to deliver this information on the case for global warming, the sequences do not

seem to fit in this documentary. The surplus of data that Mr. Gore presents throughout the roughly 100-minute film, and the inherent politicization present in this film alienate viewers that do not understand the science of climate change.

As a conference presentation, the data presented in *An Inconvenient Truth* is an effective tool to convey research to attendees. As a film, the same method of data presentation falls flat. *An Inconvenient Truth* has a total run time of 96 minutes. Rounding this up to 100 minutes, considering that there are 76 infographics as scatter plots, histograms, bar charts, pie charts, and many others within the Film, this averages to a new infographic presented every minute and twenty seconds. In conjunction with sequences conveying a story about Mr. Gore's past in this Film, this information delivery rate is too much information for viewers. Guggenheim and Mr. Gore present information in this film with the assumption that the viewer has at least some understanding of global warming's scientific principles. At the very least, they assume the viewer believes in global warming. At roughly nine minutes into the film, Mr. Gore says, "...[this] brings up the basic science of global warming, and I'm not going to spend a lot of time on this because you know it well" (*An Inconvenient Truth*). Several times he dismisses skeptics who refute the data, almost to the point of mocking them. In a conference setting where attendees have most likely spent a fair amount of money to hear Mr. Gore speak and share his beliefs, this may be considered appropriate. As a more widely available film to the public, however, this approach serves to alienate individuals who do not believe in the science behind global warming rather than include them in the conversation. Furthermore, Mr. Gore uses scientific models to present projections as a certainty rather

than a possibility. "Within less than 50 years, it'll be here" (*An Inconvenient Truth*). At this point in the film, Mr. Gore refers to shocking projections of CO₂ levels if current trends persist according to the scientific record from the last 650,000 years. Projections like these cannot be made as a certainty. According to the National Academies of Science, Engineering, and Medicine in their 2017 publication *Communicating Science Effectively: A Research Agenda*:

Some audiences know that uncertainty exists and say they want to be informed about how certain scientific findings are (Frewer and Salter, 2007). It is also possible that failing to discuss uncertainty conveys a false sense of certainty that can undermine trust should the information have to be revised in light of new findings (*Communicating Science Effectively: A Research Agenda*, pg. 27-28).

Presenting doomsday situations as certainty unless immediate action is taken has not worked in the past. It has shaken today's climate science credibility, and it does not work in this film. Predictions made in the 1970s such as the quote by Paul Ehrlich, "Population will inevitably and completely outstrip whatever small increases in food supplies we make" (Waters 2016) or by Harvard biologist George Wald in a speech at the University of Rhode Island, "Civilization will end within 15 or 30 years unless immediate action is taken against problems facing mankind" ("The End of Civilization Feared by Biochemist") are now cited by climate change skeptics to discredit current climate science.

Al Gore started his collegiate career as an English major at Harvard University. He was not particularly engaged in his studies until his junior year when, according to an article written in the *New York Times* in June of 2000, "he took Mr. Neustadt's course about presidential decision-making... After taking Mr. Neustadt's course, he switched his

major to government” (Hennenberger 2000.) This information is not presented in *An Inconvenient Truth*, for a good reason, as it may lead viewers to question why a man who majored in government at Harvard is essentially the only character in a film about global warming. The closest the viewer comes to learning about Mr. Gore's credentials related to global warming science happens roughly twelve minutes into the film when Gore recounts, "I had a professor named Roger Revelle who was the first person to propose measuring carbon dioxide” (*An Inconvenient Truth*). According to the June 2000 *New York Times* article by Melinda Henneberger, “On Campus Torn by 60’s, Agonizing Over the Path”, this class in his senior year is when his appreciation of science grew. The article explains that Roger Revelle was an oceanographer who helped pioneer research on the effect greenhouse gases have on global warming. “When Mr. Revelle shared his research with the students, Mr. Gore was hooked” (Hennenberger 2000).

Davis Guggenheim uses portraiture filmmaking in this film to show why Mr. Gore is so invested in the global warming issue. He touches on the class Mr. Gore took with Revelle and how Gore became so fascinated with the data that he followed it after the end of his undergraduate career and eventually took that data to Congress in the hopes of enacting climate protection legislation. Davis shows how Gore realized the importance of leaving a better world for his children by retelling a traumatic event involving Mr. Gore's son. Mr. Gore details, through personal experience, the difficulties of enacting change in politics when the incentive to do so is a moral one and not monetary. Mr. Gore relates to the viewer how he was so interested in the research behind global warming he "went to Antarctica, the south pole, the north pole, the Amazon..." (*An Inconvenient*

Truth) to learn more about it. While these instances in the film give background into Mr. Gore's interest, they do nothing to present his credibility in disseminating scientific data about global warming while unwittingly painting Gore as an elitist who can catch a flight to Antarctica or the Amazon to learn more about a subject. The director of this film's most considerable disservice is assuming Al Gore is the only necessary voice for this message. While Mr. Gore has unique insights into the political side of climate legislation, using him as the sole presenter of this information allows viewers to dismiss the film's message; either based on a lack of understanding of Mr. Gore's credibility or the basis that belief in global warming is a political issue.

An Inconvenient Truth was successful in box offices, and it was named best feature documentary at the 79th Academy Awards (Galloway, “‘An Inconvenient Truth,’ 10 Years Later: Al Gore, Jeff Skoll, and More Dish in THR’s Oral History”, 2016). While it may have been financially successful, utilizing a politician as the sole voice to deliver scientific data does a disservice to anyone attempting to convince naysayers or skeptics about the validity of the research that backs global warming. Portraiture filmmaking can have a substantial impact on data dissemination and information retention in science communication. It is not effective when an audience does not believe a chosen character has the credentials to convey data. Singling out Al Gore as the sole voice in a film about the climate change debate alienates audiences who may have been more receptive to the message if coming from a neutral source. In this way, the audiences that are involved and inspired after watching *An Inconvenient Truth* are likely individuals who already believe in climate change and the film likely results in little to no behavioral

change for people who do not believe in it. More voices in the film from varied backgrounds could have garnered much broader appeal. According to an NPR article from 2016, “The movie made headlines around the world, raising awareness of global warming and its predicted dire consequences for the planet and society. The movie did more than this, though, as it also politicized global warming to an unprecedented level” (Gleiser, 2016). The consequences predicted in 2006 were dire, and many of those predictions coming true. While the film was financially successful, politicizing the message in *An Inconvenient Truth* may cause future damage to climate change science in the same way that Paul Ehrlich and George Wald’s predictions in the 1970s did.

MEET THE SCIENTISTS

In 2014 a filmmaker with a Ph. D in physics made a feature film about particle physics. Mark Levinson made a film about theoretical and experiential physics that is engaging, enjoyable, and emotionally charged. According to Christy Lemire, film critic for RogerEbert.com and former film critic for The Associated Press, “You don't have to be a physicist—you don't even have to be good at math, I can certainly attest to that—to enjoy the energy, camaraderie and giddy thrill of discovery that radiates from the documentary ‘Particle Fever’” (Lemire, 2014.). *Particle Fever* begins as scientists around the globe approach the end of a twenty-year-long experiment in theoretical and experimental physics. In 2008, The Large Hadron Collider (LHC) at CERN, the European Organization for Nuclear Research in Switzerland, is about to turn on for the first time, and viewers are there to see it. From there, viewers see the first proton beam to travel around the seventeen-mile loop; they see a helium leak that delays progress by over a year. Viewers are in a control room when scientists successfully collide proton beams within the LHC for the first time and watch as the scientists interpret the data from these collisions. Levinson crafts this narrative so that viewers can quickly become emotionally invested in this experiment every step of the way regardless of their experience level or interest in physics. *Particle Fever* is indeed a data-driven film. Levinson, however, manages to avoid inundating the viewer with complex scientific principles in a film where the climax depends on the data the scientists collect from the proton beams' collisions in the LHC. Levinson's expertise in the field allows him to communicate complex theories and principles. Coupled with a brilliant choice of participating

physicists chosen to help tell this story, the scientists make this film about a monumental discovery in a highly specialized scientific field accessible, educational, and enjoyable for a wide array of audiences.

Invariably, a science communication documentary, especially one about a specific experiment like *Particle Fever*, will include data that is fundamental to the viewer's understanding of the Film. There are many choices a filmmaker can make when deciding how to present data or research in a film. On-screen text, infographics (bar charts, line graphs, pie graphs), and animation are a few of these choices when deciding how to present visual representation from a study or experiment. The use of visuals can be an effective way to quickly convey information while avoiding jargon specific to the field. With a film with a worldwide distribution like *Particle Fever*, it is fair to assume the audience is quite broad, and, therefore, it is best to avoid jargon and complex terms. In a film that centers on theoretical and experimental physics, this task could be considerably daunting. If not accomplished, it could alienate large portions of the audience from the film's message. Levinson accomplishes this engagement beautifully. The animations used in the film are informative, easy to understand, and visually appealing. One such animation shows proton beam paths within the LHC, one path in red and one in blue (Figure 1), which illustrates four locations where the beams will collide as part of the experiment (Figure 2). The viewer watches this animation as the on-screen text explains the significance. In contrast, Monica Dunford, a postdoc student and a participating physicist in the Film, explains the nuances of what the scientists are doing via voice-over narration.



Figure 1: Animation showing the path of proton beams in the circular LHC with text explaining the experiment.

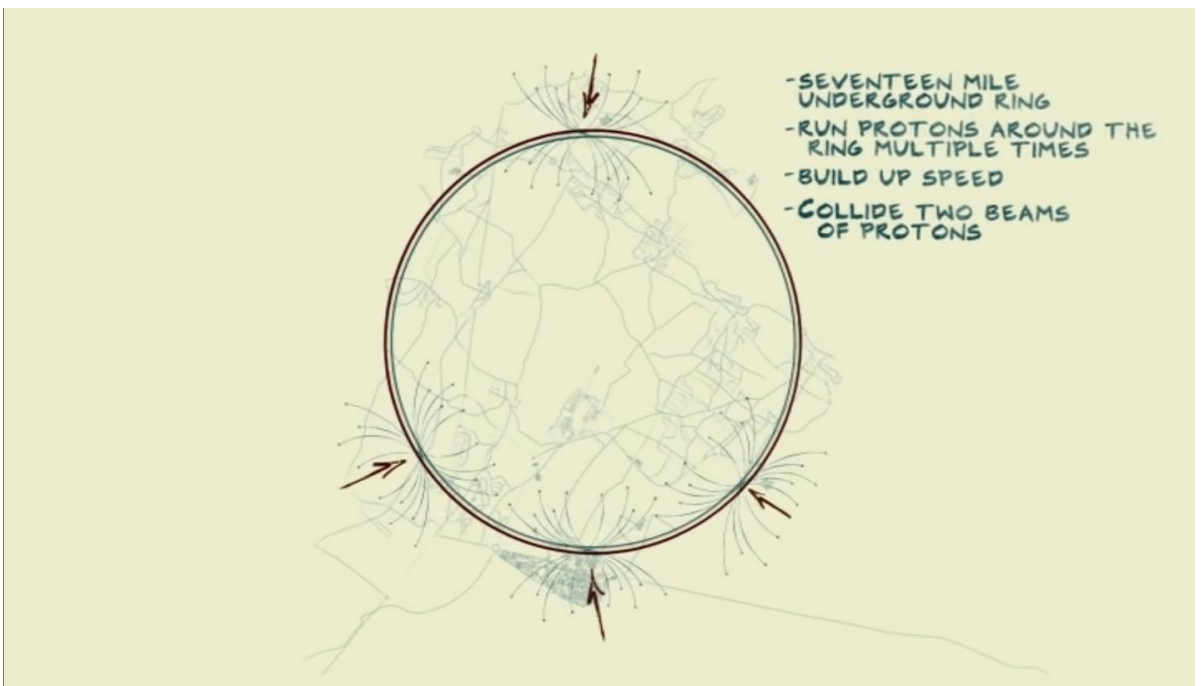


Figure 2: Animation showing four locations where proton beams will collide if the experiment is successful.

This animation in both figures is shown right after Dunford explains the experiment in an interview. "So, the LHC is basically the most fundamental of experiments. It's like what any child would design as an experiment. You take two things, and you smash them together. And you get a lot of stuff that comes out of that collision, and you try to understand that stuff" (Dunford, Levinson, *Particle Fever*).

Levinson is a physicist turned filmmaker. It is easy to see that he has a firm grasp of the field and the dynamics of what is happening at CERN. He can effectively communicate what is happening and the stakes of the experiment in ways that general audiences can understand. However, if viewers do not relate to the characters, they will be unlikely to be receptive to the message.

Levinson's compilation of participating physicists in this Film is masterful. According to Christy Lemire, ". . . he's wisely chosen figures to follow from among the 10,000 people involved from over 100 nationalities who can bring this highly specific work to life for the layperson" (Lemire, 2014). Savas Dimopoulos and Nima Arkani-Hamed are both refugees who were drawn to physics because it is a field that could provide truth in a chaotic world: "I decided to focus on a field where the truth didn't depend on the eloquence of the speaker," Dimopoulos says at roughly 35 minutes into the Film. "Truth was absolute" (*Particle Fever*).

Martin Aleksa is a husband and father of two, shown in both the control room and conducting physics experiments with his children. Fabiola Gianotti is "a classical pianist turned physicist who is in charge of the huge experiment Dunford is working on" (Graham, "*Particle Fever*': Thrills, Chills And High Subatomic Drama"), and the viewer

sees her playing her instrument while saying that there are many similarities between music and physics. While lacking the other physicists' experience, Monica Dunford conveys complex ideas in easy-to-understand terms in ways that show a true grasp of the field. Her enthusiasm for the experiment and experimental physics is infectious. When the first beam blipped on the screen, indicating that the scientists had successfully fired the proton beam around the seventeen-mile loop, she describes the atmosphere in the control room: "I don't think I can describe right now the excitement about first beam. I mean, the entire control room is like a group of six-year-olds whose birthday is next week" (*Particle Fever*). As she walks around the control room, showing a scatter plot of data coming in as the beam travels around the loop, the viewer does not need to understand what the plot means; just seeing how giddy Dunford is is enough. The sequence showing subsequent celebration at CERN the evening of the first beam is glorious. "All you really need to know about *Particle Fever* is that it includes footage of physicists rapping. About physics. Wearing giant Einstein masks" (Graham, "*Particle Fever: Thrills, Chills And High Subatomic Drama*"). The joy in the room during that celebration is palpable.

David Kaplan, the theoretical physicist and Johns Hopkins University professor, is so earnest as he explains the theories behind the experiment that viewers are hard-pressed not to share his excitement, even if some of the concepts are over their heads. Kaplan "studies supersymmetry, dark matter, and properties of the Higgs boson" (Eisenkraft, Friedman, Sneider, "*Particle Fever A Teacher Guide for Middle and High School*," pg. 9), and he explains his research in such a way that even if viewers do not

understand all of it, they trust that he is telling the truth. As Kaplan is introduced in the film, he discusses how he theorizes how matter was initially made and what the deep fundamental theory of nature is. At the same time, viewers see him in a hard hat hit his head against a pipe and laugh. From the beginning of the film, viewers know that Kaplan is not perfect. He is not an ineffable force of physics; he is a person with depth and a passion for his field of study. Late in the Film, when the beams have collided, and data is coming in, Kaplan says, "It's fucking cool right now" (*Particle Fever*).

Viewers see in an authentic way that not as much separates him from them as they might believe, as they do with all the participating physicists and the physicists who work at CERN. Their personalities are not their professions; their profession is a facet of their personalities. They are loving family members; they are refugees, trained musicians, and they are people seeking objective truth in a field they are passionate about. *Particle Fever* does the work of breaking the stereotypes of scientists as unrelatable hyper-educated nerds. This Film shows the participating physicists as real people with depth and emotion. The people in this Film are not "physicists" per se; they are lovable people who are feverish about physics.

The participating physicists in *Particle Fever* are not just their jobs. They are human beings that happen to be passionate about physics, both theoretical and experimental, but they are so much more than their chosen field. In this film, Levinson portrays this in such a beautiful way that viewers cannot help but be pulled into the narrative. There are many goals to science communication. The National Academies of Sciences, Engineering, and Medicine describe five of these goals in their research

agenda. Audiences want to know how the research they are learning about will affect them; it is almost certain Kaplan's intent lines up with the first goal: "First, the goal of science communication may be simply to share the findings and excitement of science. Many scientists wish to share their passion and intellectual excitement, believing that an understanding of their work will enrich the lives of their fellow citizens." (National Academies of Sciences, Engineering, and Medicine, pg. 17). While Kaplan admits in the film that it is hard for physicists to explain why they do these experiments, Dimopoulos says, "Why do humans do science, why do they do art? The things that are least important for our survival are the very things that make us human" (*Particle Fever*). When asked by an economist at a conference in Colorado what the monetary benefit of the LHC will be, Kaplan responds,

Basic science for big breakthroughs needs to occur at a level where you are not asked what is the economic gain, you are asking what do we not know, and where can we make progress. So, what is the large hadron collider good for? Could be nothing, other than just understanding everything (*Particle Fever*).

Mark Levinson has created a relatable, emotionally charged, compelling film about theoretical and experimental physics. While *Particle Fever* may have grossed less than one million dollars internationally in box offices, according to BoxOfficeMojo.com, the film is a success. In 2016, Levinson won the Stephen Hawking Medal for Science Communication for *Particle Fever* (Stephen Hawking Medal for Science Communication, 2016). More so than awards, in *Particle Fever*, Levinson has achieved the task of making a humorous, accessible, and relatable film about theoretical and experimental physics. Viewers may not understand everything going on in the experiment, but viewers feel a connection to the participating physicists. Thus, they are

invested in the experiment's outcome and very well may continue to follow the progress at CERN with the Higgs-boson. *Particle Fever* is an important step forward in changing the way scientists are represented in media.

PORTRAIT OF A GOAT SHEPHERD

A Happy Distraction is a short film I produced as part of my thesis for a Master of Fine Art in Science and Natural History Filmmaking. The film is a portrait of Lainey Morse, the founder and C.E.O. of Original Goat Yoga. Morse created goat yoga in 2016 after a series of serendipitous events brought Lainey together with yoga instructor Heather Davis. They hosted a yoga practice with Lainey's goats, assuming it would be an endearing one-time event for their friends and family. They were shocked as it turned into a phenomenon when *Modern Farmer* published a story on the event supplemented with Lainey's photographs. From there, goat yoga went viral, and what had been a fun outing for friends and family quickly became a multi-studio business across the country. Lainey and Heather were selling out classes months in advance, and similar goat yoga studios opened worldwide.

When I initially met with Lainey in 2017, she was fully immersed in the world of goat yoga. She had quit her job, purchased her "Goatmobile," and had opened studios across the country. She spent her days managing the business's logistics and marketing, and she spent her evenings with her goats. I had the chance to communicate multiple times over six months before arriving at her farm to film, and this gave me a chance to get to know her as a person and as a subject. "Going viral" meant Lainey had experience being interviewed and being in front of the camera. She was featured in segments for *Good Morning, America* on her farm, she had been interviewed by the *New York Times*, and done countless interviews for radio, podcasts, news stories. This film gives viewers a visual sense of whom Lainey is while also telling her story. During principal photography

on Lainey's farm, several techniques were used to give viewers a feel for the farm and the comfort her farm provides her. We conducted walking interviews through the barn and around the grounds. The style of filmmaking was less formal interview, and more of a conversation, even the sit-down interview in her.

While Lainey does advocate for goats as therapy animals, the film centers on her experience with her goats. This film is not scientific, though there is research that supports the advantages of animal-assisted therapies. Avoiding the expository model used in *An Inconvenient Truth* of using authority to present new information to convince viewers, instead, a more participatory model is used, letting viewers see and hear how passionate Lainey is about her own therapy with her goats so that they may decide for themselves how to feel about goat yoga.

The slow pace of editing at the beginning of the film replicates the feeling of calm experienced on the farm. Filming was done in a way that mimicked the experience of being with her goats. The first 44 seconds of the film are long shots of goats around the farm with no people and no dialogue. From timecode 0:44 through 2:08, Lainey is heard through voice-over (V.O.) only, a choice made to recreate the experience of watching her interact with the goats. Even at 2:08, when the viewer sees Lainey speaking, it is in a more observational cinema verité style as she is giving a tour of the barn. The viewer is granted as much space as possible to experience the farm, the goats, and how Lainey interacts with them before settling into an interview. Because the film is about Lainey and not goat yoga, she does not introduce herself as the Founder of Goat Yoga until 3:50, more than one-quarter of the way through the film. The creation of goat yoga was a

serendipitous result of the therapy and the calm Lainey experiences with her goats. Once the topic of goat yoga is introduced, however, viewers see how the phenomenon changed Lainey's life.

"You never know what going viral means until you live it" is a quote from the interview with Lainey that stuck with me throughout the process of making this film. Instead of just having Lainey explain the experience, viewers see how viral goat yoga became. The montage starting at 3:54 is comprised of 21 clips from 12 different sources to show how widespread goat yoga has become. These clips are interspersed with the interview with Lainey about her business's growth to show how she managed the experience of going viral. The montage includes clips from news broadcasts, national and international talk shows, clips from *Vogue with Sophie Turner*, and clips from *The Inside Guys* trying goat yoga. A scene of former N.B.A superstar Charles Barkley in a three-piece suit with a goat on his back is an example of both how widespread goat yoga became and how silly it can seem; which Lainey fully acknowledges. She continues to say that goat yoga is no different from taking your dog for a walk. Both involve being outside, exercise, and bonding with a companion animal. She concludes by saying that, "It's just new, and so people judge what they don't understand." (T.C.: 6:34). By showing that Lainey acknowledges that goat yoga can be a bit silly, some viewers may find her more relatable and be more open to listen to her thoughts on the therapeutic aspect of the practice.

On June 01, 2019, Lainey held a goat yoga retreat for local cancer survivors, members of Project H.E.R., on her farm. Many women there experienced goat yoga for

the first time. Again, I wanted the viewer to as if they are on the farm while remaining as unobtrusive as possible. The goat yoga sequence is a small percentage of the film's entirety because goat yoga is a small part of Lainey and her goats' story. As the film transitions away from the goat yoga practice, it seems as though Lainey is nearing the end of her "Hero's journey." She is managing her autoimmune disease, she has a new partner, her satellite businesses for goat yoga are thriving across the country, and she has a herd of goats that have accompanied her through it all. According to Lainey, "It feels like I've got the best of two worlds, I get to do a business that makes people happy, *with goats*; and I get this other life where I just get to be a goat shepherd [laughs] and it's awesome." No one could have known that the road back would involve a global pandemic.

The onset of COVID-19 in March of 2020 affected the whole world, changing the lives of billions. In June 2020, Lainey and I met via Zoom for one last interview for the film. Despite the technical limitations of recording a Zoom call, viewers still see who Lainey is. She is optimistic in the face of adversity. She is a fighter. Goat yoga is not over, not by any means. It is just, as Lainey puts it, "on a pandemic pause" (13:02). "We're a tough lot, us goat yoga people," she laughs, "We will still be here at the other end" (12:46 - 12:52).

By avoiding the expository model of presenting information in an authoritative voice to prove that goat yoga is effective animal-assisted therapy, viewers have the freedom to come to their own conclusions about the phenomenon. Viewers get a feel for who Lainey is, they hear how therapeutic her goats have been for her, and they see goat yoga in practice. By framing this film as a portrait of Lainey and her experiences rather

than the research behind it, the intent is that viewers will be interested in learning more about the practice's therapy aspect and not dismiss it as an irrelevant internet craze.

CONCLUSION

Media can influence our perception of reality. By relying on cliches and stereotypes, artists have the power to represent scientists with negative connotations through a variety of mediums, including literature, fiction, film, sitcom television, and animated television. *A Happy Distraction* is not a pure science film. It is an example of a model that can be used in science communication to get viewers to empathize and relate to characters. By using portraiture in documentary films, directors can break stereotypes and give scientists positive representation. In advocacy films where the intent is to change behaviors, audiences may be more inclined to listen to the character advocating for change if they can relate to that character. Portrait filmmaking is an effective tool to meet that end. Viewers are not generally perceptive to being told that they should care about a subject or an issue. Presenting data as an authoritative voice and expecting the viewer to take that data at face value is akin to the filmmaker telling the viewer what to care about. Including portraiture in these films can give viewers a framework of why the director or the characters think the subject is important. Suppose viewers empathize with the character or the characters they are watching while also seeing that they are passionate about a subject. In that case, they can decide for themselves if that subject is important to them. I am not trying to convince anyone to schedule a goat yoga session. I am presenting the story of one woman who found healing through her goats. Viewers are free to decide for themselves if goat yoga is a silly trend, legitimate animal-assisted therapy, or *A Happy Distraction*.

REFERENCES CITED

A Beautiful Mind. Directed by Ron Howard, performances by Russell Crowe, Ed Harris, and Jennifer Connelly, Universal Pictures, 2001.

A Happy Distraction. Directed by Nick Hill, Montana State University, 2020.

“An Inconvenient Truth (Movie).” *AlGore.com*, <https://www.algore.com/library/an-inconvenient-truth-dvd>. Accessed March 30, 2021.

An Inconvenient Truth. Directed by Davis Guggenheim, performance by Al Gore, Paramount Classics and Participant Productions, 2006.

Eisenkraft, Arthur, Friedman, Alan, Sneider, Cary. “*Particle Fever* A Teacher Guide for Middle and High School. May, 2014. <https://www.filmplatform.net/wp-content/uploads/2016/01/Particle-Fever-Teacher-Guide-FINAL.pdf>. Accessed March 09, 2021.

Galloway, Stephen. “‘An Inconvenient Truth,’ 10 Years Later: Al Gore, Jeff Skoll, and More Dish in THR’s Oral History” *The Hollywood Reporter*, 19 May 2016, <https://www.hollywoodreporter.com/features/an-inconvenient-truth-10-years-894691#:~:text=The%20%241.1%20million%20picture%20became,issue%20three%20times%20a%20week>. Accessed April 13, 2021

Good Will Hunting. Directed by Gus Van Sant, performances by Robin Williams, Matt Damon, and Ben Affleck, Miramax Films, 1997.

Gleiser, Marcelo. “After 10 Years, ‘An Inconvenient Truth’ Is Still Inconvenient. *NPR*, 4 May 2016, <https://www.npr.org/sections/13.7/2016/05/04/476717308/after-10-years-an-inconvenient-truth-is-still-inconvenient>. Accessed April 14, 2021.

Graham, Trey. “‘Particle Fever’: Thrills, Chills And High Subatomic Drama.” *NPR*, 7 March, 2014, <https://www.npr.org/2014/03/07/286240920/particle-fever-thrills-chills-and-high-subatomic-drama>. Accessed March 10, 2021.

Henneberger, Melinda. “On Campus Torn by 60’s, Agonizing Over the Path.” *The New York Times*, 21 June, 2000, <https://archive.nytimes.com/www.nytimes.com/library/politics/camp/062100wh-gore.html>. Accessed March 09, 2021.

Lemire, Christy. “Particle Fever.” *RogerEbert.com*, 5 March, 2014, <https://www.rogerebert.com/reviews/particle-fever-2014>. Accessed March 10, 2021.

Lorre, Chuck and Bill Prady, creators. *The Big Bang Theory*. Chuck Lorre Productions and Warner Bros. Television, 2019.

National Academies of Sciences, Engineering, and Medicine. (2017). *Communicating Science Effectively: A Research Agenda*. Washington, DC: The National Academies Press. doi: 10.17226/23674.

Nichols, Bill. *Introduction to Documentary*. Bloomington: Indiana University Press, 2001. Print.

Particle Fever. Directed by Mark Levinson and David Kaplan, participating physicists [NH2] Martin Aleksa, Nima Arkani-Hamed, Savas Dimopoulos, Monica Dunford, Fabiola Gianotti, David Kaplan, Mike Lamont, Anthos Media and P.F. Productions L.L.C., 2014.

Proof. Directed by John Madden, performances by Gwyneth Paltrow, Anthony Hopkins, and Jake Gyllenhaal, Miramax Films, 2005.

Serkan Hekimoglu & Emily Kittrell (2010) *Challenging Students' Beliefs about Mathematics: The Use of Documentary to Alter Perceptions of Efficacy*, PRIMUS, 20:4, 299-331, DOI: 10.1080/10511970802293956

Shelley, Mary. *Frankenstein*. Chelsea House, 2019.

“Stephen Hawking Medal for Science Communication, *Starmus*, 2016, <http://history.starmus.com/stephen-hawking-medal-for-science-communication/>.

Tartakovsky, Genndy, creator. *Dexter's Laboratory*. Turner Broadcasting System, TNT, Cartoon Network, and Warner Bros. Distribution.

“The End of Civilization Feared by Biochemist.” *The New York Times*, 19 Nov. 1970, <https://www.nytimes.com/1970/11/19/archives/the-end-of-civilization-feared-by-biochemist.html> Accessed April 21, 2021.

Waters, Hannah. “Why Didn’t the First Earth Day’s Predictions Come True? It’s Complicated” *Smithsonian Magazine*, 22 April 2016, <https://www.smithsonianmag.com/science-nature/why-didnt-first-earth-days-predictions-come-true-its-complicated-180958820/> Accessed April 21, 2021.