

Mathematics and Hollywood

by Paul Larsen

An analysis of Hollywood portrayals of mathematicians cannot be done in a vacuum: we must consider not only how mathematicians are represented or misrepresented, but also how this representation compares with portrayals of other professions, academic or otherwise. Let us begin then with a rapid survey of how Hollywood characterizes different professions.

If you are a lawyer, you fall into one of two categories: you are either a corporate sell-out who props up robber-barons while padding your own retirement nest, or you are a fiery idealist fighting against corporate sell-outs by defending one of the following: a plucky child witness to a mob crime, a pelican, or a fitness goddess framed for the murder of her husband by a frizzy-haired step-daughter (who surely has corporate aspirations).

Should you be a doctor, you are unequivocally a good person (provided you are a lead part). You may discover a treatment that awakens patients from 20-year comas, expose a toxic spill caused by a pharmaceutical company in the developing world, or found rural health clinics while wearing red clown shoes. On the downside, you have a complex and often troubled personal life. You struggle with an addiction to fentanyl to get you through your long shifts, you are never good enough to please your father, and due to your ruddy good looks and sensitive eyes, the attention you get from female patients and hospital staff forces you to repeatedly tell your partner, ‘You’re the only one for me, Carol—you know that.’¹ Lastly, you face daily battles with greedy hospital administrators and narcissistic fellow practitioners (but since your arrogant coworkers have only a side role, there is no danger that they will prevail).

If you are an archaeologist, then you are lucky indeed. Your students fawn over you, even when you have hardly prepared for lecture because you were out plundering indigenous artifacts for the benefit of the Western museum-going bourgeoisie. Moreover, your occupational hazards (rolling boulders, attacking tanks, and snakes) only heighten your appeal to the opposite sex.

Let us turn now to a non-professional group, and one that merits more sober reflection—people with mental illnesses and handicaps. First, a qualification: most of what I know about mental illness and handicaps is from reading and conversations. My personal experience is limited to volunteering with the Special Olympics and two family members, one who had Prader-Willi syndrome, and one who has Down’s syndrome.

As with the above professions, Hollywood portrayals of mental illness and handicaps tend to be romanticized. For example, only a tiny fraction of people with autism possess even one of the savant-like traits of Dustin Hoffman’s character in *Rain Man*. And few people with psychosis evoke chuckles as does Brad Pitt’s character in *12 Monkeys*.

Nevertheless, the romanticized aspects of mental illness in film are often tempered by raw cuts from genuine experience. Raymond’s intolerance for physical warmth in *Rain Man* is an anguish known by many family members of autistic people. The shot of John Nash staring vacantly into space as his infant son wails in his arms could hardly be less

¹ Hollywood has come a long way in terms of countering the traditional gender roles of doctors and nurses, but the plight of the doctor with ruddy good looks and sensitive eyes remains an exclusively male one.

romantic. In *{Proof}*, Catherine's description of the unflattering aspects of taking care of her mentally ill father strikes a painful chord with anyone forced into a care-taker role.

In a similar fashion, the few Hollywood portrayals of mathematicians display a tension between romanticized fantasy and unflattering frailty. It is no coincidence that mathematics-themed movies resemble portrayals of the mentally ill in this respect, since two of the three best-known mathematics movies, *A Beautiful Mind* and *{Proof}* (with *Good Will Hunting* rounding out the trio), feature mathematicians struggling with mental illness. The independent film, π , tells the story of a mathematician who ends up lobotomizing himself.

While it may be unjust that four of six² starring mathematicians in the aforementioned films are mentally unstable, mathematicians are not immune from mental illness. John Nash is only the most popularized example. Kurt Gödel effectively killed himself by starvation because he believed the nurses attending him were trying to poison him as part of a conspiracy. Carl Jacobi, known for his obsessive work tendencies, suffered at least one nervous breakdown. Many believe that Ludwig Boltzmann committed suicide because of widespread doubt regarding the atomic hypothesis, which was an explicit assumption of his work (and is regarded as having been proved by Einstein's work on Brownian motion published a year before Boltzmann took his own life).

Anecdotal evidence only goes so far, but it is worthwhile to consider if there is something distinctive about mathematics that courts mental instability. One possible answer is that mathematics can be isolating to a degree that is unique among academic disciplines. For example, while a graduate student in the history of science may not be able to explain to her grandparents the relevance of Social Construction to Boyle's air-pump experiments, at least the characters involved in the story are real to the grandparents. Likewise, biology and chemistry quickly become technical to the point of making communication between the practitioner and laypeople a near impossibility, but again, the objects of study (genes, peptides, etc.) are universally considered to be real things.

The same does not hold with mathematics. Except for those in very applied research, or who have a robust faith in the ontological value of string theory, most of us spend our days thinking about objects that are not considered real to the people around us. For the Platonists among us, the situation is even more dire: for them, the mathematical objects are the most real, even though to everyone else they are at best shadows.

At the same time, mathematics can be a very social discipline. In contrast to literature scholars who withhold publications out of fear another will scoop their source, or law students who hide library books from their classmates, mathematicians tend to follow an 'open-source' approach to their work. The more people that know about your work, the better the chance for progress. Collaboration is the norm, not the exception.

This communal aspect of mathematics both balances the isolating tendencies of the discipline and sits squarely at odds with Hollywood portrayals. In *A Beautiful Mind*, John Nash never attends class, preferring to chase pigeons and search on his own for a 'big idea.' Will Hunting is an autodidact whose relationship with other mathematicians is to explain what he has figured out on his own. Catherine, Gwyneth Paltrow's character in

² Here I include the characters of Gwyneth Paltrow, Anthony Hopkins and Jake Gyllenhaal of *{Proof}* in the tally.

{Proof}, writes her astounding notebook while holed up in almost complete isolation with her father (it is clear by the end of the film that they did not bat mathematical ideas back and forth during that time). Max, the protagonist of π , spends the film hiding his work from Wall Street firms, the U.S. government, and a mystical Jewish sect.

While it would be nice to see Hollywood make a film about a mentally stable mathematician who collaborates with a rich network of other well-balanced mathematicians, it is understandable why Hollywood does not make such movies. The typical American film involves a scrappy underdog overcoming great adversity to achieve undying fame and adoration. In law films, the adversity derives from a corrupt government or corporation; in medically-themed films, the adversary is death itself; in archaeology films, the insuperable obstacles range from heart-eating indigenous people to greedy fellow archaeologists aligned with forces bent on world-domination. In a mathematics film, what would be the adversity? A really long calculation?

It is no surprise that Hollywood turns to other, often less flattering aspects of a mathematician's life for the drama. And as long as Nancy Lamm is bound by her contract with the University of Texas not to send off her script (provisionally entitled, 'Horns in the Hall: How Mathematicians Saved Texas') until after she has retired (may that day never come), we must wait and be thankful that at least Hollywood has given us four conversation pieces to fill in the awkward silence at social events when we reveal what we do for a living.