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How (West) Hollywood Adds Up:
A queer theoretical view of mathematics and mathematicians in film
by Christopher Goff

Many recent popular and award-winning films situate mathematicians and their mathematics in leading roles. These films demonstrate ways that mathematical ability complicates the sexual lives of those who possess it. Mathematical talent is seen as a condition from which there is no escape, no denial, and no cure.

Thus, mathematical ability is an inherent component of identity most similar to sexual orientation in that both are innate, undeniable, and must be performed in order to achieve personal fulfillment. Also, both conflict and interact with other aspects of identity, including class, religious beliefs, mental and physical health, and gender. This paper discusses four recent films (*A Beautiful Mind*, *Pi*, *Mean Girls*, and *Good Will Hunting*) and describes how the mathematical talent of each protagonist problematizes her or his personal relationships and how each film relates mathematics to concepts of class, religion, health, or gender.

As a queer professional mathematician, I feel uniquely qualified to identify and critique public images and stereotypes of mathematicians' sexual lives. However, I also feel unqualified to locate my work among the various queer theories of today. In what follows, "queer" will mean roughly the opposite of heteronormative. It may help to consider me an ambassador, one who is attempting to learn the customs—indeed the language—of a land quite different from his own. As such, I am only just beginning to realize the depth of the word "queer" and its significance in my own mathematical life.

The 2001 film *A Beautiful Mind* (Howard) adapts the identically titled Sylvia Nasar biography of John Nash. The film portrays John (Crowe) as odd, disturbed, and brilliant. He does not attend class because he strives to come up with a truly original idea. His idea, which indeed upends the capitalist theory of Adam Smith, comes to him (in the film) as a way for him and all his friends to get laid. The viewers have already seen his failed earlier attempt at picking up a woman. After Princeton, John works for the Department of Defense, but soon his paranoia and hallucinations take over. After commitment to a psychiatric hospital (and undergoing insulin injections), John returns to his wife Alicia (Connelly) in Princeton and his problems are medicated out of him. So too are his mathematical ability and sexual desire. The medicine has made him unable to perform (his identity). But after palming his pills—hiding them from Alicia—his powers and his demons return. However, instead of recommitting him, Alicia is convinced by John to let him think his way out of it. Over the course of many years, he succeeds, even returning to teaching and ultimately receiving the Nobel Prize in Economics.

The film equates—or at least strongly links—mathematics with mental illness in many ways. First, John's psychiatrist (Plummer) claims that normally, schizophrenia is diagnosed early, but because John was a mathematician, it was not caught until later. That is, paranoia and hallucinations seem in line with mathematical reality. Second, while on psychiatric drugs, John shows a friend some of his work on the Riemann zeta function—the next big pan-mathematical problem after Fermat's Last Theorem—explaining that the medication makes it hard for him to think straight. The friend looks at pages of meaninglessness and

gently informs John that there are more things in life than work. Third, after taking himself off his medication, John's mathematical spark returns, along with his hallucinations, paranoia, and supposedly his ability to "respond to [his] wife." Ultimately, the film claims that John employs his extreme logical powers to overcome his mental illness: he reasons his way out of schizophrenia. His reward is his return to a normal marriage with his love, Alicia. He delivers his "Love conquers all" Nobel speech to her directly, with little regard for the rest of the audience.

Nasar, on the other hand, discusses Nash's ambiguous, changing sexual orientation. She writes, "[B]etween the ages of twenty-four and twenty-nine, Nash became emotionally involved with at least three other men. He acquired and then abandoned a secret mistress who bore his child. And he courted—or rather was courted by—a woman who became his wife" (167). At the time (early 1950s), Nash worked in Santa Monica for the RAND Corporation on highly classified government defense projects. Historically, several homosexual mathematicians—contemporaries of Nash such as McKinsey and Turing—worked in secretive environments, perhaps by psychological necessity or perhaps a timely confluence of the *Zeitgeist*. In the summer of 1954, as a result of a police sting, Nash was arrested for indecent exposure in a public men's room at Santa Monica beach. He subsequently lost his job at RAND. Nasar points out that, "[a]lthough Nash appeared unscathed, the arrest was a turning point in his life" (PAGE?). The arrest preceded the onset of his schizophrenia by four years, but Nasar points out that stressors can build up over time and precipitate mental illness. As evidence, she presents the suicides of mathematicians McKinsey and Turing following their public outings, quite recent events at the time.

Nash's relationship with his wife Alicia is also simplified in the movie. In real life, Alicia married Nash in February of 1957. About two years later, she had him committed for the first time for his decreasing grasp on reality. Psychiatrists offered explanations ranging from Alicia's recent pregnancy (fetus envy) to repressed homosexuality (homosexual panic) (259). Alicia committed him again in 1961, and eventually divorced Nash two years later. His sister, mother, and Alicia arranged to have him committed yet again later that year as his schizophrenia worsened. However, in 1970, Alicia did let Nash live with her, as a boarder, partly out of pity and partly because she realized that no one else would take him in (340). After twenty years or so, Nash began to recover while wandering the streets and halls of Princeton. The two remarried in 2001.

Regarding his mathematical ability, Nasar writes, "A predisposition to schizophrenia was probably integral to Nash's exotic style of thought as a mathematician, but the full-blown disease devastated his ability to do creative work" (19). So his mental state may have helped his unique insights in the beginning, but eventually the illness prevented him from doing high quality mathematics. She continues, "A spontaneous recovery from schizophrenia ... is so rare, especially after so long and severe a course as Nash experienced.... But...people...had no doubt that...he was 'a walking miracle'" (21). Nasar stops short of hinting that Nash was able to think his way to wellness, but points out that a rigorous study concludes that about 8% of schizophrenics are deemed "well" after 30 years or so. "Thus, while Nash's dramatic recovery is not unique, it is relatively rare" (353).

By choosing to ignore Nash's sexual orientation and nontraditional marriage, the film categorizes Nash too simply as a straight man that suffers from mathematical-talent-cum-mental-illness. As a result, the film *unqueers* the real-life Nash, opting rather to queer his mathematical talent, making *it* the source of his schizophrenia, and ensuing strain on his marriage. Rather than proposing that his schizophrenia is precipitated at least in part by his struggle to rectify his identity with societal norms of sexual behavior, the film oversimplifies its message to one stating that mathematical ability is a form of mental illness, which in turn can disrupt, though never quite conquer, true heterosexual love.

Perhaps the filmmakers of *A Beautiful Mind* were influenced by the 1998 film *Pi* (Aronofsky), which possesses a similar sentiment, but without the "happily ever after" ending. The main character, number theorist Maximilian Cohen (Gullette) cannot stop looking for patterns "in nature." Ever since staring into the sun as a child, Max has suffered intermittent seizures emanating from his right temporal lobe. He is extremely anti-social, as evidenced by his eremitic isolation, the locks on his door, and his apparent lack of interest in his attractive female neighbor. Max's breakthrough ideas are often accompanied by an impending seizure—often with vaguely erotic imagery—for which he takes pills, injects himself, or both, although with little effect. Max is pursued by a Wall Street firm and a group of Hasidic Kabbalistic Jews because of his work in number theory. Throughout the film, Max always seems on the verge of grasping a deep pattern, but before he gets it, another episode sends him back to a different Square One. After one particularly painful seizure, Max awakes in the arms of the sexy neighbor, and subsequently throws her out of his apartment. To stop the pain, Max drills a hole in his right temple and passes out. In the next scene, he is calm and sitting outdoors. A neighborhood girl quizzes him with two math problems, which he would have solved easily and quickly at the beginning of the movie, but which he is unable to solve now. He smiles, relieved.

The film presents mathematics as leading to divine knowledge or ultimate truth. As a result, Max's mathematical ability conflicts with religion and limits of human knowledge. Early in the film, Max's homemade computer predicts a few stock prices, prints out a 216-digit number, and then turns to goo. This number represents different forms of divinity to the different groups in the film. For the Wall Street firm, the number holds the key to predicting the stock market. For the Hasidic Jews, the number translates through Kabbalah to the true name of God. For Max, this number encodes artificial intelligence or his computer's brief self-awareness. For Christians, 216 equals 6 times 6 times 6, recalling the number of the beast. At one point, Max entertains messianic thoughts (his last name *Cohen* means *priest* in Hebrew), after being kidnapped by the Jewish group and asked to reveal the number. He balks, yelling, "I was chosen. It was given to *me*." Robeson (Margolis), Max's advisor, mentor, and sole human contact, points out that his obsession with 216 will make him see that particular number everywhere. "[A]s you discard scientific rigor," he tells Max, "you're no longer a mathematician; you're a numerologist." To drive this point home, after Max is "cured", a neighborhood girl presents him with two mathematics problems, each of which has decidedly numerological overtones. First, 255 times 183 is 46,665. Note the three sixes in a row. Also, $748/238$ reduces to $22/7$, a common approximation for the actual value of pi.

A consequence of this religious dimension to mathematics—and those who follow its teachings—is a necessarily celibate existence. Max is unable to notice, much less return, even the minimal romantic interest he receives from the woman next door. As a monk or “priest” of mathematics, his sexuality must be suppressed. The film also links Max’s mathematical ability to his illness, similarly to *A Beautiful Mind*. As soon as his seizures are gone, so too are his mathematical talent and his attendant anxiety. We can only presume that he will now be able to pursue a “normal” relationship.

While some may resort to extreme measures to deny their mathematical talents—and thus pursue the opposite sex—others, such as Cady Heron, choose a less drastic course. In 2004’s *Mean Girls* (Waters), Cady (Lohan) arrives at high school her junior year after being home schooled in Africa by her research zoologist parents. She likes math “because it’s the same in every country.” Despite problems fitting in at school, she *is* good in math. “Nothing in math class can mess me up.” Enter Aaron (Bennett), the cute boy. She joins the Plastics—female teen royalty—and uses her math ability to calculate the percentage of calories from fat in leader Regina’s (McAdams) snack. She considers joining the Mathletes—they get twice the funding if they have a girl on the team—but both the Plastics *and* her *misfit* friends, Goth Janis (Caplan) and gay Damian (Franzese), all warn her that she would be committing “social suicide.” In order to talk to Aaron, she pretends to be bad at math, even purposely failing Calculus tests. But Cady cannot deny her mathematical talents. She reveals her deception to Aaron while drunk at her own party, only to drive him away. To earn back her lost math credit, she must compete for the Mathletes at the state competition. In sudden death, she and the other team’s token girl attempt to answer a question. Cady remembers the answer only after deleting Aaron’s face from her memory. She returns to the Spring Fling to be crowned Queen while wearing her Mathletes jacket. Later, she enjoys a slow dance with Aaron.

Cady’s mathematical talent conflicts with her gender and sexuality in several ways. First, because of stereotypes and social pressures, she is forbidden from joining the Mathletes, even though that is—according to the film—where she belongs. Unfortunately, by presenting her talent as exceptional, the film fails to debunk the stereotype that girls can’t do math. Second, she hides her mathematical ability from Aaron so that she will have an excuse for him to tutor her. She decides that concealing her talent presents the quickest road to a relationship with the boy of her dreams. Third, when competing with the Mathletes, her appearance has returned to her ponytail and pants, despite her movie-long journey through curls, makeup, and glam couture. As made evident in the commentary track on the DVD, Cady’s final “look” is intentional. Apparently, glamour and mathematical talent do not mix. It is only as plain Cady in her Mathletes (read: dorky) jacket that she receives the accolades of her peers. She and Aaron dance together only after her poignant acceptance speech/speech of acceptance.

Indeed, mathematics offers Cady acceptance. She does not have to explain herself or pretend to be something she’s not in the math world. Unlike the Plastics, or even her other friends, mathematics requires no pretense and no action on her part. Her innate mathematical ability is her pass.

Will Hunting also possesses a pass to the elite world of mathematics. In the 1997 film *Good Will Hunting* (van Sant), Will (Damon) works at MIT as a janitor, hangs out with his friends (Affleck, Affleck, Hauser), and reads voraciously on mathematics and other topics. His mathematical talent gets him into trouble when he is seen solving a problem left by Jerry, a mathematics professor (Skarsgård), for his “Applied Theories” class. He winds up in jail, but Jerry works a deal to get him released, provided he works on mathematics with Jerry and sees a therapist. After many failed attempts, Will meets Sean (Williams), a therapist who can handle him, and begins to put his life in order. Will success is evidenced by his cross-country drive to win back the woman of his dreams (Driver).

The film analyzes the relationship between mathematics and class in several ways. First, Will’s position as a janitor reinforces the innateness of his mathematical talent. He has had no college education, and so his ability must be inherent. Second, Jerry and Sean represent complementary authorities from opposite sides of the tracks. While Jerry teaches enraptured, brilliant students at elite MIT, Sean, from South Boston, tries to keep his bored, mediocre community college students awake with inappropriate jokes. Mathematics is a noble pursuit. Mark Saul expands on this point in a review for the American Mathematical Society’s *Notices*. “Had he been gifted in sports or rock music, the plot could not turn on the choice Will has to make between his background and his destiny” (2). That is, Will is joining a new elite class of genius mathematicians. At one point, Will lights a proof on fire, and Jerry frantically puts it out, adding, “I can’t do this proof, but you can, and when it comes to that, there’s only about a handful of people in the world who can tell the difference between you and me....” Third, Will’s best friend (Affleck) tells him that he should follow his mathematical talent out of construction work in South Boston, but not because he owes it to himself. Rather, “You owe it to me. Because ... you’re sitting on a winning lottery ticket and you’re too much of a pussy to cash it in, and that’s bullshit. ‘Cuz I’d do fucking anything to have what you got. So would any of these fucking guys.”

Indeed, the film presents mathematics as Will’s salvation from his wretched existence. Mathematics releases Will from his prisons, literal and psychological, leading ultimately to his successful relationship with a woman.

In addition to pointing out how mathematical ability can problematize heteronormative relationships, each film also sets up an analogy between mathematical ability and queerness. Will Hunting and Cady Heron must perform their mathematical talent in public, despite their attempts to conceal it. Will’s therapist asks him why he took a job at MIT, of all places, hinting that Will wanted to come out. According to co-screenwriter Damon on the DVD commentary track, “we really were trying to set up the fact that ... Will *is* excited about doing the math. There is something that he can’t help that he really does *enjoy*....” Cady Heron knows deep down that she’s good at math—she’s *that way*—despite her efforts to act otherwise. She finally wins acceptance after being honest with herself.

For Max Cohen and John Nash, mathematical talent causes or is caused by their physical and mental health problems. Here the analogy is more broad: there is something wrong—physically and /or mentally— with John and Max.

Both lose their mathematical abilities (read: are cured) when they enter the world of sanity and normalcy through medicine.

These films are not unique in their portrayals of mathematics. The upcoming *Proof* (Madden, 2005), will also discuss the relationship between mathematical ability, gender, and mental illness, assuming screenwriter Auburn is faithful to his original play.

Like other aspects that make up who we are, mathematical talent and mathematics itself are difficult for outsiders to comprehend. And like sexual orientation, mathematical ability is often presented as a part of the self that is innate, unchangeable, and unavoidable. By showing ways that mathematical ability interferes with societal norms of sexual behavior, these films reinforce the position of mathematical talent as a fundamental and complex component of identity.

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