The Genius as a Characterization of the Creative Spirit in Mathematics and the Arts

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Abstract

It is easy to observe that today's society assigns its artists and mathematicians the status of *genius*. In this note I first introduce the phenomenon and then focus on the possible disadvantages of this stereotype.

The problem

In today's popular culture, mathematicians and artists are both viewed as geniuses. The mathematician is a genius, who is seldom understood by his family and neighbors, and yet, left to his own devices he is bound to create astounding theoretical constructs. The artist too is not one of the common people. Her genius eludes her relatives and friends. And yet, we know that she is a free spirit who will reach unfathomable heights through her craft. Here I explore possible disadvantages of this stereotype.

Note that here and in what follows, I have intentionally used the male pronoun for the mathematician and the female pronoun for the artist. My main purpose in this note is to analyze the stereotypes around these professions, and with this gendering I hope to point toward yet another dimension of the issue. Much has been written about gender discrepancies in mathematics performance and representation. Apparently even women themselves do not believe they are any good at it [2]. However some recent work is pointing toward positive changes in the mathematical community and how perhaps we are misrepresenting or misinterpreting various statistics about women in mathematics [9]. As a female mathematician myself, I'd prefer to be optimistic, if not about the status quo, then about the trajectory of progress. By examining, dissecting, and perhaps eventually dismantling the genius stereotype, I believe we might speed up that progress.

The genius phenomenon

The dictionary definition [4] of the word *genius* is provided below to initiate this discussion:

genius	noun (pl. *geniuses*)
1	exceptional intellectual or creative power or other natural ability: *she was a teacher of genius*; *Gardner had a real genius for tapping wealth*.
2	a person who is exceptionally intelligent or creative, either generally or in some particular respect: *one of the great musical geniuses of the 20th century*.
3	(pl. *genii*) (in some mythologies) a guardian spirit associated with a person, place, or institution. OR a person regarded as exerting a powerful influence over another for good or evil: *he sees Adams as the man's evil genius*.
4	(pl. *genii*) the prevalent character or spirit of something such as a nation or age: *Boucher's paintings did not suit the austere genius of neoclassicism*.

Clearly the genius is different from the normal, the standard, the average. And genius involves intelligence and creativity, both at levels beyond what is common. Most recent depictions of the artist and the mathematician in popular culture and the media as well as many of our stereotypes associated with these professions identify people in these professions to have at least some attributes of the genius.

Albert Einstein, though not necessarily a mathematician, fits the typical perception. Someone who is exceptionally bright, someone who can see things in ways vastly different from the average person on the street. John Nash and Ted Kaczynski are two more contemporary figures who symbolize that mathematical creativity is often accompanied by a tendency for atypical mental states and genius of the mathematician is often accompanied by eccentricity or mental imbalance.

The artist's genius is also accompanied by an aura of eccentricity. We only see the best of her work, the end product of her endless efforts, and we admire the genius mind who must have created out of nothing these pearls that reflect something beyond meager human existence. The artist and her genius, they deserve our respect, our awe.

Possible origins of the genius stereotype

The origins of the genius stereotype are quite obvious. Most people only know the best work of the artists and the mathematicians that they have heard of and those latter are almost always the ones who have had a tremendous impact in their respective fields. Naturally these fine specimens are exceptionally intelligent or creative, or at least we believe them to be. Their biographers report mostly how special they were, not whether they liked to dip their bread into their soup bowl like all those other poor souls on the planet.

And then there are the many bizarre stories: about the genius mathematician who strolled into a war zone not aware of his whereabouts and spent a few days in prison, content, doing computations; about the genius artist who decided to cut off his own ear to finally end his unending pain; about the genius mathematician who rejected a million dollar prize and the highest honor in today's mathematical world; about the artist who decided a soup can could be the content of a masterpiece.

Do we perpetrate these stories ourselves? I can answer for the mathematicians: Yes we do! As mathematicians we enjoy the stereotype of being slightly or significantly above average in intelligence and creativity. Perhaps we hope that the genius of Ramanujan, the greatness of Euler will rub on us too by verbal contact, if we continue to retell their stories. I commented extensively on this attitude of our community in a recent book review [8].

And according to some scholars, this is true of the artists as well. Indeed Dixon in her impressive tome [3] on melancholia, a malady associated through the centuries with creative genius, argues lucidly that the artists of the seventeenth century "unabashedly appropriate[d] the traditional attributes of Saturn [and the creative genius] in their own self-imaging" (page 189). They did this, according to Dixon, in order to distance themselves from the world of craftsmen and instead to be associated with the life of the mind, with explicitly intellectual pursuits. As the European Enlightenment took hold, our understanding of what melancholia really was has evolved, and some of the appeal of this connection corroded, but the stereotype is strong with us still. As Dixon says while wrapping up her analysis, "artists and intellectuals continue to proclaim their unique gifts by appropriating and perpetuating [these] characteristic idiosyncracies. To be accepted as a genius, one must look the part" [3, page 192].

Can there be any disadvantages of the genius stereotype?

Genius breeds respect. By definition it implies that the person described by that word is "exceptionally intelligent or creative." And intelligence and creativity are the super-values of our century. We do not care as much about virtue, faith, work ethic in the twenty-first century. This is the era of intelligence, the era of creativity. The creative geeks have won the world. And we want a piece of it. So we continue to identify our profession with genius, just as we humbly retort, "*of course, I am not a genius, but* . . . " and chuckle. Nonetheless it may be worthwhile to consider whether there may be any disadvantages to this stereotype.

Indeed I can identify three specific disadvantages. Here I list them briefly. [In the accompanying presentation I intend to explore these in some more detail.]

- The *genius stereotype* creates a distance between the *real world* and the worlds of the artist and the mathematician. This leads to turning away many who might otherwise be tempted to attempt their own possible venture into these fields. ("*Math is not for me. I am no genius!*", "*I cannot be Van Gogh! What's the use?*")
- Many teens and young adults go through a stage full of an intense desire to fit in and be normal. The *genius stereotype* clearly demarcates the normal and desirable from the mathematical and the artistic. Once again this leads to youngsters turning away from even a serious attempt at mathematics or the arts. [This is a serious problem for mathematics education in particular.]
- The pressure the *genius stereotype* puts on the individual mathematician and the artist should not be ignored. Through a creative writer's perspective, Elizabeth Gilbert describes this pressure in her now famous TED talk titled "Your Elusive Creative Genius" [5]. The mathematical version is described best in a letter to the editor titled "Emotional Perils of Mathematics" by Donald Weidman published years ago in 1965 in *Science* [11]. Also see the recent talk titled "The Dark Heart of Our Brightness" by Matilde Marcolli [10].

We can study the first two in tandem. In particular it is clear that the stereotype separates the genius from the normal. Margot and Rudolf Wittkower explicitly identify several unpleasant character flaws of the creative genius "type": prone to mood swings, depression, antisocial behavior, sloth, debauchery, miserliness, paranoia, sloppiness, and suicide [12]. All of us can think of some colleagues and snicker, but when one needs to be serious, it should become clear that none of these traits are really related to being able to do good mathematics or being able to create amazing art. And in fact their association with our profession hinders our recruiting efforts.

Extreme intelligence or outstanding, unworldly artistic skills may be good to have, but they are certainly not prerequisites to join the ranks of our profession. It takes only one time attending a mathematics department meeting to see that logical fallacies, hyperbole, and inconsistencies also find a comfortable home among mathematicians as they argue vehemently about small and irrelevant matters. More seriously, there are apparently over thirty thousand members of the American Mathematical Society [1]. It would be quite a hypothesis to assume that all of them are geniuses. There are many out there working as actuaries or insurance agents or software developers, and yes, there are many out there teaching mathematics and doing it, too, in their daily lives. And most people would not consider these poor souls to be geniuses. But surely most of them do self-identify as mathematicians.

Similarly there are many in the world of art who do not make it big. As one reviewer of this paper noted, many will be "drawing kitsch-images for tourists in resort towns" or painting houses or preparing stages for children's performances. Society will not impart those with the genius stamp. But they belong to the world of art, and they see themselves as artists.

There are the select few, the geniuses of mathematics and the geniuses of art. And then there are the normal majority. Perhaps it is time to share with the rest of the world their lives, their joys and tribulations. In a community of artists and mathematicians made up of the greats, the also-rans, and the rest who are in it for the long haul no matter what, we have the opportunity to declare to the world that the lives of all of us are enriched by our association with mathematics and the arts. We may or may not be cherished after our demise as the Einsteins or Mozarts or Raphaels of our era, but we are here today. We each gain joy and find meaning through our engagement with mathematics and the arts. Celebrating the joy of mathematics and the arts, the Bridges community can be a facilitator for bringing about a world which understands these two realms of creativity better and inviting keen outsiders in. Finally our secret will be out: Our common room is bigger on the inside.

Departing questions

What the Wittkowers have done for the artist ("convincingly debunking the mad artist ideal" [6]) needs to be done for the mathematician. In their own way Reuben Hersh and Vera John-Steiner have done just that. In their recent book [7], they write about being a mathematician and aim to debunk some of its focus on the genius myth. But we, the mathematicians on the street as it were, should also think about this question. What can we do to debunk the genius stereotype? Why should we? What would we lose?

References

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[12] Margot and Rudolf Wittkower, *Born Under Saturn: The Character and Conduct of Artists* (2007). New York: New York Review Books (originally published in 1962).