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A Reflection on Growth Mindset and Meritocracy

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Synopsis

As mathematicians working in higher education, we reflect on meritocracy and growth mindset with a focus on the relationship between the two. We also note the subtle differences between growth mindset and grit. Our reflection ends with suggestions for how to move forward in the math classroom and throughout the collegiate level.

Keywords: *growth mindset, meritocracy*

1. Introduction

“Ideologies provide a framework for making sense of the world and they gain power based on legitimizing the present state of things. Racial ideologies, then, work best when they offer invisible, commonsense explanations to keep the status quo. [...] It shows the denial to recognize how institutional inequality bestows unearned advantages to Whites.” - Dan Battey and Luis Leyva [1]

As mathematicians, we believe that the idea behind growth mindset is essential, both in the work we do, and in the way we speak about and teach mathematics. In our work, we are continually stretching our minds, striving to understand abstract ideas while finding patterns and making connections between concepts. In our interactions with students, we emphasize that success in math comes from continual learning rather than natural talent, thus emphasizing a growth mindset. These actions are in opposition to a fixed mindset, wherein we distinguish ourselves and others based on perceived natural talent in mathematics. Whether intentional or not, growth mindset plays a role in the way we conduct ourselves as mathematicians.

Therefore, when we see articles like “Rejecting Growth Mindset and Grit on Three Levels” [24], which argue that educators promote and reinforce myths about meritocracy when they emphasize growth mindset, it is in our best interest to reflect on and understand the relationship between these concepts. In this paper we reflect on the intricacies of meritocracy, growth mindset, and grit through a critical lens while considering the beneficial aspects of growth mindset. Our guiding questions are as follows: *Does growth mindset promote meritocracy and, if so, what influence do these messages have? What are drawbacks associated with the promotion of a growth mindset?* We conclude with a discussion of ways to incorporate the core ideas of growth mindset into the classroom.

2. Meritocracy

“Under [meritocracy], not everyone can (sic) attain success – you still need to work hard and demonstrate talent – for the first time, the ladder of opportunity is (sic) accessible to anyone. That remains its ostensible promise: whoever proves to exhibit the most merit [...] will be granted access to society’s best opportunities.”
- Ogi Ogas and Todd Rose [21]

The moment students step into the education system, they enter a meritocracy — a system driven by rewarding accomplishments. Students in “advanced” classes have the freedom to travel to other classrooms. Students that complete assignments and exams early are granted extra recess. “Gifted students” are tracked and given increased educational opportunities and resources [25]. Undergraduate students that do well in classes have the

opportunity to become paid tutors through departments. Honor societies, awards, and special events mark the achievements of our students. The benefits from these examples continue to persist for students long after they leave K-12 and through post-secondary. In contrast, students not receiving these opportunities experience lasting ramifications. Even among educators, meritocracy is alive and well. To receive professional development funds, to get promoted, to get tenure, educators need to demonstrate merit.

In theory, the construct of meritocracy probably seems reasonable, and even perhaps natural or desirable. People should be rewarded for their accomplishments. But in practice we are turning a blind eye to some critical questions. Who is being recognized for their merits? At what point are we rewarding privilege over merit? And who decides what counts as merit?¹

As early as primary school, we begin to see how socio-economic status plays a part in student success. For example, in the United States, public primary and secondary schools depend on property taxes for one-third of their funding [18]. These funds are dependent on the location of the school and therefore inherently benefit populations with higher socioeconomic status. Furthermore, students living in poverty not only face challenges in school quality, but have significant life circumstances that directly affect their schooling experience and performance [2]. Federal funds are no better. Policies like No Child Left Behind build upon and further contribute to an already discriminatory system by penalizing schools whose students do not perform well, forming walls between those with privilege and those without [15]. In addition, non-white school districts have lost \$23 billion in comparison to white school districts due to the 2007-2008 financial crisis [7], which impacts the resources available to the students.

Inequities start at the onset of students' educational journey and continue to compound, thus resulting in a lasting effect. In *Nice White Parents*, a podcast series from Serial Productions,² Chana Joffe-Walt investigates the effect of white parents' relationship with public schools in New York City, sharing how schools cater to white parents as a way to gain a strong reputation.

¹ It is worth noting that the term meritocracy was coined ironically and was never intended to be an educational framework; interested readers may check out [28].

² The five-part series is available on most podcast platforms; for more on *Nice White Parents*, see [23].

All of these instances of relative advantage and disadvantage have a disproportionately negative effect on students of color, low-income, and rural communities as they continue in a meritocratic system.

We believe that a main issue with the construct of meritocracy is that it ignores each student's unique background and beliefs. From the onset and as students progress through the education system, their experiences, backgrounds, and advantages continue to diverge. As educators, it is important for us to understand that every student in our classroom has already led a vast and unique life. Even when we are aware of this, by the time students reach the college classroom, the meritocratic system is already ingrained in the way they are viewing their experience. They often internalize the general message, that the system is telling them what they deserve based on their past performance. All the same, many students are also aware of the biases built into the system, and at times it feels to them like it is less about demonstrating the knowledge that they have gained and more about surviving a biased "carrot-and-stick" system. Thus the construct and assumptions of meritocracy act as a thin veil used to maintain deeply seated practices in society that benefit specific groups and disadvantage others.

How many times do teachers say "everyone can succeed" when in reality they should say "everyone could succeed if the playing field were equitable?"

3. Growth Mindset

"A growth mindset isn't just about effort. Perhaps the most common misconception is simply equating the growth mindset with effort." - Carol Dweck [6]

In *Mindset: The New Psychology of Success* [6], Carol Dweck proposes growth mindset as a solution to navigating the educational system, which is assumed to be neutrally and inherently meritocratic, while maintaining a focus on individual success. A growth mindset is one in which you believe that "qualities are cultivated through your effort," whereas a fixed mindset is one in which you believe that your "qualities are carved in stone." In addition, the framework of growth mindset proposes that failure is an integral part of learning. Dweck goes on to say that "people with a growth mindset believe that every person's true potential is unknown; that it's impossible to foresee what can be accomplished with years of passion, toil, and training" [6, page 7].

Growth mindset aims to harness rich personal development rather than promote comparison against peers.

A growth mindset approach to math education promotes the idea that math ability is developed rather than an innate quality one possesses. As educators, it is particularly important for us to understand how growth mindset can be promoted within the classroom. The core principle of growth mindset is to encourage self-reflection and self-assessment, and some instructors have promoted it through reflection activities such as reading articles like “How Your Beliefs Can Sabotage Your Behavior” by James Clear [4] or by watching videos, such as “Fixed Mindset v. Growth in Math” by Jo Boaler [3]. Growth mindset can also be promoted through subtle actions. For example, an emphatic “yet” in response to the statement “I just don’t know how to do this” might remind learners that learning is a process. There has also been promising work done at the K-12 level on possible psychological interventions around growth mindset. For example, Yeager *et al.* conducted a cross-institutional online intervention to increase growth mindset and found a uniform positive effect on math and science grade point averages [27].

How do students move towards a growth mindset when the structures in place prohibit growth? Is it even possible to foster such ideas in a system that values merit, especially when what counts as merit is so often opaque? What about in a system that is structurally racist? An uncritical emphasis on growth mindset has the potential to disregard the systemic barriers, history, and challenges that large groups of students have faced, are facing, or will face. In particular, such systemic barriers exist for many students from marginalized communities.

As we acknowledge students’ individual or societal circumstances, we must be careful that the narrative does not move away from the mathematics or student progress and towards a discourse on math ability and individualism, where independence and self-reliance are stressed. Within certain interpretations of the ideology surrounding growth mindset, there is the underlying assumption that a student’s only barrier to what they can accomplish is themselves. Such discourse will almost always imply that certain students are lacking math ability or effort, which could be detrimental to the academic journeys of already marginalized students.

In short, when we begin to generalize all students’ experiences, the message behind growth mindset goes awry. An individualist narrative enforces the

twisted message that growth mindset equates to “work harder to achieve more.” This takes us to the primary way we see the ideas of growth mindset distorted: grit.

4. Grit

“In the name of efficiency, institutions usually collapse the entire variety of human passion into a single featureless ‘generic motivation,’ a simple one-dimensional metric ranging from high to low. Generic motivation goes by many different names, including self-discipline, resolve, tenacity, perseverance, fire in the belly, and grit. But in the final analysis, all these labels are merely shorthand for ‘Your individuality does not matter.’ ” - Ogi Ogas and Todd Rose [21]

There is a small, yet important, distinction between grit and growth mindset. In 2016, Duckworth defined grit as sustained passion and persistence applied to achieve long-term goals [5]. The guiding motivation behind grit is that it is available for anyone to learn and it is a predictor of success.

We venture to say that when promoted unconsciously, the construct of growth mindset evolves imperceptibly into grit. And what could be wrong with that?

At first glance, a declared emphasis on grit appears to have no negative consequences in the mathematics classroom. Many can agree that to succeed (however you may interpret success) in mathematics, and more generally in higher education, the foundations for grit are needed. Yet grit can neglect a student’s personal history, cultural background, well-being, etc. Dr. Bettina Love declares a focus on grit to be the “educational equivalent of *The Hunger Games*,” that is to say that grit can be perceived as overcoming a series of challenging events where only a few (or one) will come out as victor [17]. The promotion of grit may send a message of “you’re not working hard enough on what we deem important” to the learner who is struggling, rather than an emphasis on self-reflection and growth. This in turn can create an environment where students are encouraged to over-extend themselves, and often not for their own benefit but for their instructors’ comfort.

Grit is typically conceptualized with a disregard to institutional and systemic barriers. Only a select few succeed in a grit culture, thus turning the whole

enterprise into an individualistic venture. When grit is encouraged in the educational setting, those challenged by institutional barriers get left behind. Furthermore, grit overshadows challenges that a student may have previously faced, as is the case with underrepresented students in mathematics. When thinking about marginalized students, for example, grit is positively acknowledged for those students who “succeed”, but educators often fail to acknowledge the students who do not meet the external standards of success.

In summary, we believe that while growth mindset is not a perfect framework, it allows students to reflect on their relationship with their studies. On the other hand, grit at face value emphasizes hard work and success in relation to others, and pits the individual against peers, all the while dismissing the impact of systemic considerations.

5. Moving Forward: Does growth mindset have a space in our classroom?

“We now know that when students experience differentiated and culturally responsive supports and challenges, only the slimmest subset of children are incapable of meeting our academic standards.” – Joe Feldman [10]

We can promote growth mindset consciously, and therefore de-emphasize the destructive myths about meritocracy, by encouraging reflection, leading student-driven discussions, and modeling a growth mindset as the instructor. We start this section with some questions for the reader to consider: What does a “socially conscious” growth mindset framework look like? And, how would we implement such a framework? Is the exclusion of certain groups’ histories and experiences inherent to the framework of growth mindset?

In the rest of the section, we share some of our ideas on how to positively cultivate growth mindset in the mathematics classroom and throughout the collegiate level.

5.1. Reflections

When promoting growth mindset consciously, instructors should be mindful of who is present in their shared classrooms and mathematical spaces. Setting up a classroom that cultivates reflection encourages students to adopt a growth mindset without forcing the tools and ideas onto the student.

This might look like having students write their “mathematical autobiography” at the beginning of the semester or by having students write journal entries throughout the course. Mathematical autobiographies help instructors understand and respond to students’ disposition for learning mathematics; see for example [22]. Some sample guiding questions are:

- Tell us about your childhood. Do you recall what first sparked your interest in math (if at all)?
- Who were/are your mentors?
- Detail your first experience(s) where you were supported/discouraged in learning more mathematics.
- What positive/negative experiences have you faced in previous mathematics courses?
- What are some of your short-term and long-term goals (personal, academic, etc.)?
- What contemporary issue would be helped by math?
- What social, structural/institutional, and individual forces have served as obstacles in your experiences in learning mathematics?

Journal entries throughout the course allow instructors to understand and respond to students’ thinking. Additionally, they help promote the instructor’s own growth by providing an opportunity to identify places for improvement in their instruction and ability to guide students’ learning, exploration, and appreciation of mathematics. Some possible journal prompts are:

- Describe a new strategy, method, or topic you learned.
- What new math words did you learn? How well do you understand the definition? Can you make a connection of that word with other real-life applications?
- What mistakes or misconceptions have you caught yourself making? How will you correct this?
- What have you found challenging? How have you challenged yourself?

As for the students, journal entries allow students to express their thoughts in written form. They also allow them to reflect more deeply on their own learning processes; see for example [14], where the author uses questions to encourage students to engage metacognitively with their own learning. Based on our experiences, students have appreciated revisiting their notes and journal entries during the lectures or group sessions. They also have a written record of their growth in their own mathematical practices and knowledge. Journal entries allow students to see how their thinking has changed and how much mathematics they have learned.

End of semester portfolios are another way to incorporate reflection throughout the entire course. Portfolios provide an opportunity for all students to reflect on what they have learned over the semester. Students who struggled can identify areas of growth to gain a deeper understanding of their academic journey and students who performed well can find something challenging and interesting, where they were encouraged to learn more or to help others grow and learn.

5.2. Engagement

Growth mindset fosters curiosity and further reflection of the material. Now that we have seen how to build time and space for reflection into our courses, we turn our attention towards how to show students that we value both reflection and growth.

We consider two ways to accomplish this goal. The first is to engage with students during and after the reflection activities through written responses, discussions, and class time devoted to such endeavors. Through these actions, we are telling students that we consider reflection to be a valuable portion of the course and their learning throughout the course. Traditionally, providing a grade for reflective engagement signals to students that we value these assignments, but it is also possible to show students we value these assignments through goal setting, peer discussions, and emphasizing the relationship between reflections, self-assessment, and exam scores [10].

The second way we can show students we value reflection and genuine student growth is to adopt mastery-based grading (or similar variants) or find opportunities for students to reassess and demonstrate growth in particular areas. Mastery-based grading is a system that assesses and promotes deeper learning through a grading scheme structured around flexibility for mastering standards rather than achieving points for a letter grade [11].

It reinforces a growth mindset as it allows students to return to concepts they didn't understand fully the first time around. In contrast, students in a traditional points-based grading scheme are less likely to continue to grapple with difficult concepts after a summative assessment has passed and thus viewing the failure as permanent. Adopting this approach towards grading signals to the students that ultimately their instructor cares about them learning the material. When implementing mastery-based grading, it is important to have a clear set of standards and rubrics for students to fully understand what is being asked of them, which allows them to take more ownership of their own learning within the classroom. Furthermore, this approach provides natural flexibility which gives students the ability to work around unexpected circumstances.

5.3. Institutional Changes

Promoting grit, under the guise of growth mindset, emphasizes the unhealthy meritocratic aspect of our educational system which leaves no space to interpret the individual's experience. Below are a few systemic changes that can de-emphasize the myth of meritocracy and promote growth mindset in a healthier manner.

The first is to de-stigmatize differences in understanding and experience. It is not where we begin at the start of the journey that matters but rather the success we experience along the way and at the end. One way we can take a step in this direction is to remove SAT and GRE score requirements from college and graduate admissions.³

The second is to work alongside bridge programs to build systems embedded in departments and universities that support student growth and sense of belonging. Folks running programs such as Bridge to Enter Advanced Mathematics (BEAM), the Math Alliance, and the Enhancing Diversity in Graduate Education (EDGE) think deeply about how to support under-represented students and prepare them for the next stages in their academic journey. Some of the first steps to building a support system within a department or university should be to reach out to these leaders and learn what works well and what are challenges in supporting these students.

³ Readers may read up on the issues about the SAT and GRE in admissions in [8, 9, 13, 12] and [16, 19, 20], respectively.

By working with or alongside bridge programs, we can gather and analyze data leading to the integration of best practices for underrepresented students into our departments and universities.

Finally, we, as mathematics instructors and administrators, can be more aware of our students' backgrounds. The university structure can support these efforts by providing professional development on culturally responsive teaching (see for example [26]) and enhancing communication between faculty, academic, and behavioral university systems. In doing so, we will equip ourselves with the tools to better support our students.

The suggestions that we are proposing to move us forward work on the level of the individual, classroom, department, and university. It is important to focus on all levels of the university system to deemphasize and even remove the myths of meritocracy, and instead, emphasize student growth and cultivate a more equitable learning environment.

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