

Newsletter of the Metropolitan Mathematics Club of Chicago Volume LII No. 5 Feb. 2023

The Evolution of Batting Statistics in Baseball

March Speaker Scott Powers



At the Des Plaines Elks Club:

Friday, March 3, 2023 Doors Open/Social Hour: 6:00 PM Dinner & Talk: 7:00 PM

Des Plaines Elks Club 495 Lee Street, Des Plaines \$35 for Members, \$40 for Nonmembers

Reserve by noon, Monday, February 27 Online at mmcchicago.org Batting statistics in baseball have come a long way since the introduction of batting average in the 19th century. The biggest breakthrough in evaluating individual contribution to team success is due to ideas from high school math. The publication of *Moneyball* in 2003 opened eyes to the predictiveness of batting statistics, and front offices have been chasing that predictiveness ever since. We will discuss the math underpinning those insights and how teams use new technology to continue improving the predictiveness of their batting metrics.

Scott's passion for math was stoked at the Illinois Math and Science Academy, and his higher education culminated in a PhD in statistics at Stanford University in 2017. From there, he worked five seasons in baseball research & development for the Los Angeles Dodgers and one season as an assistant general manager for the Houston Astros. Scott is transitioning to education in July, when he will join the faculty of Rice University as an assistant professor of sport analytics and help build out the curriculum for their new sport analytics major.

In observance of Lent, fish and chicken entrees will be provided at Elks Club for this talk at no additional charge.

Points from the Interior by Laura Kaplan

The Swiss Cheese Model of accident prevention is used in aviation safety, healthcare, and risk management among other areas. According to Wikipedia, it "likens human systems to multiple slices of Swiss cheese, stacked side by side, in which the risk of a threat becoming a reality is mitigated by the differing layers and types of defenses which are 'layered' behind each other." On a recent episode of her podcast, Truth for Teachers, I heard Angela Watson asserting that this model has promise for use in education. Allow me to explain.

Often, we have a concern in our classrooms. Perhaps there are many students who are not submitting their homework to your school's LMS (Google Classroom, Canvas, etc.). Initially, you assume that this is because students are doing the homework but forgetting to submit it. So you start every class with a reminder to them to submit and provide a minute for those who need to accomplish that. You soon realize that you still have several students who are not submitting their homework. The Swiss Cheese Model would suggest that you leave your current practice in place, and layer on top a second practice of, perhaps, emailing parents when homework is not submitted. This, too, will probably help some, but not all, of the students. Now you have less of a problem. Some students were helped by the reminder at the start of class. Some were helped by parental involvement. But there are those few students who still slip through the cracks (or holes, as it were).

For these students, we leave the first two practices in place. Daily in-class reminders and parental involvement are continued, but we layer yet another support over the first two, perhaps offering "Homework Time" in your classroom a couple days a week after school. Each of the layers has flaws – you could forget to remind them at the start of class, the parents could miss the email, or some students might have an after-school job they need to go to. But with several layers, we can avoid more missing homework than with only one.

Often when we talk to one another about what we're doing in our classrooms, we share a single idea or procedure we have in place. "Emailing parents has made all the difference," we say. When someone tries that, and it doesn't have the desired effect, it is easy to abandon the practice altogether. As humans we tend to think in all-or-nothing ways. We want *the* solution that fixes it all. The Swiss Cheese Model pushes back on that to say that none of our solutions needs to be perfect. Instead, layer them together so that where one fails, another can pick up.

I am certain that the MMC community can think of many other classroom struggles and the layers we could apply in an attempt to alleviate them. I look forward to hearing them from you when we are next together on March 3 for Scott Powers at the Des Plaines Elks Club!

Reaching More Students in Less Time by Danielle Grenader

Have you ever wanted a better way to teach numeracy — that is, a way to help students construct numerical relationships? In her talk, Pam Harris demonstrated one way to do this using problem strings!

Before diving into problem strings, Pam started by sharing a bit about her journey and philosophy. She shared that, like many students and new teachers, she once had a very different perspective on what it means to do math, seeing the subject as a set of disconnected facts to memorize. However, her viewpoint shifted after working with her son on his homework and seeing the ways he used his own reasoning to solve problems. Now, instead of seeing math as "memorizable" she saw it as "figure-out-able."



Like Pam's son, we want students playing with numerical relationships. Pam suggests that we move away from the mindset of "How can I help my students get answers to these kinds of problems?" toward the mindset of "How can I immerse my students in these kinds of problems so that they grapple with the relationships that are happening and make sense of what's going on, so that then they can reason through these kinds of problems?" As she explains, this distinction is noteworthy! The approach of answer-getting lends itself to teaching procedures and coming up with any means necessary — stories, songs, etc. — to help students memorize whatever it is they need to know. The approach of making sense does not involve mimicking, but rather, thinking and reasoning.

So how do we help students "figure out" math? This is where the problem strings come in! As Pam explains, a problem string is a series of related problems that are purposefully sequenced to help students construct relationships and develop problem-solving strategies. In this talk, we started with simple arithmetic problems involving whole numbers, used some strategies and understandings from those problems to approach arithmetic with decimals, and finally connected this thinking to basic algebra. Through this problem sequence, Pam encouraged us to take note of how we can connect gradelevel content to fundamental skills in such a way that kids might begin to see these connections and view math as figure-out-able.

For those who have never seen one of Pam's problem strings before, it's worth noting that they often make use of open number lines. These are blank number lines that do not have any tick marks or numbers already on them. In this way, students are really able to dive into their own reasoning around numerical relationships without having to be confined within anyone else's framework. I have used Pam's problem strings in my 6th grade classroom to explore ratios and proportional reasoning, and in these problems, she uses a similar approach, but with double number lines! As Pam proposes, I have found that these number lines truly do allow students to manipulate numerical relationships through their own reasoning and allow for great discussion. Additionally, the fact that this method uses visual modeling is a big plus! Could you see yourself trying this approach in your own classroom?

Pam's talk gave us a lot to think about, and one talk wasn't enough to learn it all! To learn more, check out her social media, website, podcast, and publications!

MMC Scholarship for High School Seniors

The Metropolitan Mathematics Club of Chicago is offering a \$2,500 scholarship for a high school senior who will pursue a career in the teaching of mathematics. The selected student will be honored at the MMC meeting in May.

A selection committee of MMC members appointed by the Board of Directors will determine the scholarship award recipient. To be eligible, applicants must be sponsored by a current member of MMC, submit the application and a transcript, request a letter of recommendation from a mathematics teacher, and respond to the prompts in point E below. All materials must be received by March 7, 2023. Feel free to email your submissions. You will receive a reply, so you know that it is being considered. The committee will evaluate applications and will make a recommendation to the Board of Directors as to the awarding of the scholarship.

The guidelines used for selection shall be:

- A. Demonstration of overall academic scholarship with an inclusion of at least eight semesters of college preparatory mathematics. (A minimum cumulative grade point average of 3.0, where A = 4)
- B. A statement of the intention to pursue a career in mathematics teaching.
- C. Indication of participation in extracurricular activities, especially those that may have a positive influence on a teaching career.
- D. A letter of recommendation from a math teacher who is familiar with the applicant's academic performance and their potential as a mathematics teacher. The teacher must be an MMC member.
- E. A short response from the candidate (1-2 paragraphs) to each of the following prompts.
 - a. What qualities do you possess that will help you in a teaching career?
 - b. Describe a teacher who has had an impact on your education.
 - c. Was there a time when you struggled with a concept in a math (or other) class? What did you do?
 - d. What was your favorite math class? Why?
 - e. Describe your favorite math problem. What makes it so great?
 - f. What excites you about mathematics?
 - g. Why do you want to teach mathematics? This response may be longer than the others, if necessary.

In addition to the application form (available at mmcchicago.org), applicants must also send:

- 1. A letter of recommendation from a mathematics teacher (preferably not sent through the applicant*)
- 2. A current transcript for seven semesters of high school.*
- 3. Responses to the prompts in point E above.

*Letters of recommendation and transcripts may be sent by separate mail or e-mail.

Send to: Carrie Fraher Glenbrook South High School 4000 West Lake Avenue Glenview, IL 60026 (cfraher@glenbrook225.org)

Gratitude for Conference of Workshops by Maryjoy Heineman and Nicolette Norris, MMC Conference co-chairs

The third Virtual MMC Conference was held on Saturday, February 4, and it was a success. Thank you to all the speakers who were willing to present their talk in this format. The attendees enjoyed being able to connect with the math content and pedagogy.

A huge thanks goes out to the planning committee: Beth Ann Ball, Peter DeCraene, Dan Hall, Aimee Hart, Laura Kaplan, Liam Keigher, and Mary Wiltjer. Your dedication made it possible for this conference to happen.

Peter DeCraene did a wonderful job with the registration and sending out all the links to the attendees. Thank you for also being available the day of to help people with their links and other issues that arose.

The MMC Board volunteers who helped with the Zoom meetings were awesome. You helped to make sure each session ran smoothly.

We certainly know that teachers have enough on their plates, but fortunately, many felt that you needed more engagement and attended our after session to talk to other colleagues about what was learned in the morning. It was so great to see so many teachers excited and ready to use what they learned at the conference.

Soon you will be hearing about the MMC Conference of Workshops 2024. We hope that we can have the conference in person. Please be on the lookout for information and the call for speakers during the summer.

MMC Candidate Biographies

*Ballots for the MMC President-Elect and Board of Directors will be mailed soon.

President-Elect:

Jackie Palmquist: Jackie is the chair of the Mathematics Department at Metea Valley High School, Indian Prairie School District 204. With a passion for teaching and leading, she ensures that ALL students have access to high quality math education. She volunteers, presents and leads with local, state and national math organizations. In her 3 years as Director of Professional Learning for NCSM, the premier mathematics leadership organization, Jackie has led events focused on leading in mathematics through a lens of equity and social justice in mathematics teaching as well as building leadership through math coaches. Jackie is also the author of a book series about using number talks in secondary classrooms, available at thumbsupmath.com. Her work and collaboration with secondary teachers support and promote Number Talk routines for easy teacher implementation. Her passion to share the power and benefits of this routine drives her to present and build meaningful professional development in person and virtually. She has led and presented both locally and nationally on the benefits of Number Talk routines for all learners. Jackie looks forward to the possibility of serving as President-Elect and on the board of MMC, an organization that has both supported and stretched her as a teacher and leader. She hopes to give back in a way that impacts future teacher leaders in our area.



Officers

Laura Kaplan, President Dan Hall, President-Elect Aimee Hart, Past President Sheila Hardin, Board Chair Beth Ann Ball, Secretary Carol Nenne, Treasurer

Directors

Beth Ann Ball (2021-2024) Maine South H.S., Park Ridge

Steve Condie (2021–2024) Illinois Mathematics & Science Academy (retired), Aurora

Sara Curran (2020–2023) Homestead Elementary, Aurora

Serg Cvetkovic (2020–2023) Thomas Kelly H.S., Chicago

Carrie Fraher (2021-2024) Glenbrook South H.S., Glenview

Danielle Grenader (2021–2024) Highcrest Middle School, Wilmette

Sheila Hardin (2020–2023) Oak Park & River Forest H.S., Oak Park

Aimee Hart (2022–2025) New Trier H.S., Winnetka

Maryjoy Heineman (2022–2025) Evanston Township H.S., Evanston

Laura Kaplan (2020–2023) Regina Dominican H.S., Wilmette

Liam Keigher (2022-2025) Larkin H.S., Elgin

Janice Krouse (2022–2025) Illinois Mathematics & Science Academy, Aurora

Carol Nenne (2020-2023) Lemont H.S. (retired), Lemont

Nicolette Norris (2022-2025) Chicago Vocational Academy, Chicago

Mary Wiltjer (2022-2025) Glenbrook South H.S., Glenview

Officials

Community Relations an	d Development Janice Krouse
Conference Co-Chairs	Nicolette Norris Maryjoy Heinemar
Conference Registrar	Peter DeCraene
Finance Committee Chair	Mary Wiltjer
Historian	Serg Cvetkovic
Membership Coordinator	Mary Wiltjer
NCTM/ICTM Affiliate Representative	Steve Condie
Points & Angles Editor	Sara Curran
Publicity and Posters	Carol Nenne
Scholarship Chair	Carrie Fraher
Social Media Chair	Danielle Grenader
Webmaster	Peter DeCreene

Candidate Biographies (cont.)

Board of Directors:

Serg Cvetkovic: Serg currently serves as MMC's parliamentarian/historian and has previously been the community relations liaison and president of MMC. He has taught mathematics in the Chicago Public Schools for 19 years with the last 12 being at Kelly High School on the southwest side, where he also coaches the school's math team. A strong supporter of access and equity in mathematics education, Serg is diligently working to increase exposure of more advanced mathematics topics to students from marginalized communities. He has had considerable success with this endeavor as a teacher in Math Circles of Chicago. In his spare time, Serg enjoys bicycling, reading comic books and science-fiction novels, and training to hopefully one day become a crossword puzzle champion.

Sheila Hardin: Sheila has been teaching math at Oak Park and River Forest High School for the past 28 years and has been a math team coach for the past 26 years. Sheila has served as a board member of MMC for the last 12 years and is currently the Board Chair. Sheila believes that it is important to be a part of the MMC board to continue being part of an organization that is dedicated to mathematics and education.

Laura Kaplan: Laura has been a teacher since 2000 and a member of MMC since 2005. She served on the Board of MMC from 2011-2017 and as Scholarship Chair from 2012-2017. Laura teaches at Regina Dominican High School where she is the National Honor Society Moderator and Mathletes Co-Moderator. She is honored to currently serve as MMC President and would be delighted to also continue to be a voting member of the board.

Jackie Palmquist: Please see Jackie's biography on the previous page!

Sue Ellen Vozza: Sue Ellen is an instructional coach and mathematics teacher. She began her career in education as a high school mathematics teacher and was in the classroom for 20 years before she transitioned to her current role at Adlai E. Stevenson High School as an instructional coach. Sue Ellen holds a degree in Mathematics Education from the University of Illinois, a Master's degree in Mathematics from Northeastern Illinois University and a Master's degree in Teacher Leadership from Concordia University. Currently, Sue Ellen works alongside teachers in both the high school and middle schools, partnering with them to implement non-traditional instructional routines designed to engage students and to encourage them to move beyond procedural thinking and to develop deep conceptual understanding and problem-solving skills.

2022-2023 MMC Dinner Meeting Incentive Programs

"Bring a Friend" Nights: Bring someone who has never attended an MMC dinner meeting, and introduce them to MMC! Both you and your guest(s) will receive \$5 off your dinner costs. There is a limit of 2 guests per meeting for the reduced cost, but you can still invite more people to come with you! This incentive is good for the March in-person meeting.

"New(er) Teacher" Program: Are you a teacher in your first 5 years of teaching? If so, you can take advantage of this incentive! Pick up a new(er) teacher card at registration and bring it back to be verified each time you attend a dinner meeting. Attend the first two in-person meetings this year, and get your 3rd inperson meeting at half price!

Thank you to our generous members who are sponsoring this program.

Please be sure to register all attendees using the reservations link on the website. Mention the incentive when you check in at the meeting to take advantage of these programs.

Is your membership current? Check your mailing label to see when your membership expires. You can renew by mail with the form below or renew in person at the next dinner meeting.

NAME HOME ADDRESS	PREFERRED CONTACT Check one:	Mork
CITY	STATE	Mail cc
HOME PHONE	HOME E-MAIL	femb pmplete
EMPLOYER		ership d form an
WORK ADDR	lerare tun	d check
WORK PHONE	WORK E-MAIL	Cha
ELECTRONIC-ONLY MEMBERSHIP Check the box below for electronic-only membership. You will receive an email wit direct link to each issue of Points & Angles when it is posted on the web site, o before paper copies are mailed. You will no longer receive Points & Angles by mail	th a ften L. MEMBERSHIP TYPE 1 year (\$35) student*, 1 yr (\$22) 2 years (\$65) 11st yr teacher*, 1 yr 3 years (\$90) retired, 1 yr (\$28)	nge of Add MM(1644 Glen
The student and 1 st -year teacher memberships are only available as electronic-or	ess MEMBERSHIP COST \$	dress For C Portage Ru view, IL 60
Make check payable to <i>MMC</i>	SPEAKER FUND	m 025

Upcoming Events

Fri., Mar. 3	Scott Powers	The Evolution of Batting Statistics in Baseball
		(Des Plaines Elks Club)
Fri., May 5	Eugenia Cheng	X + Y: A Mathematician's Manifesto for
		Rethinking Gender (Des Plaines Elks Club)

Send upcoming event items to sburnett_308@yahoo.com no later than the date of the MMC dinner meeting preceding the issue in which the item should appear. All items are subject to editing.

Your membership renewal date appears in the upper right corner of the label



MMC Glenview, IL 60025