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The Healing Powers of Mathematics in the Age of #metoo

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Synopsis

The ideas of mathematics can provide metaphors to help people handle traumatic situations, or to better understand life experiences. In this short note, the author describes three ways in which the study of mathematics has given her ways to cope with her own difficult experiences.

It's common to hear about a student's grades suffering after they've been through a trauma. After all, it is hard to concentrate when you are going through something awful, whether it's a death in the family, sexual assault, or any other particularly terrible experience. It's less common to hear about people escaping into their mathematics classes, though it certainly happens. I found mathematics to be a refuge during a time of crisis. Later, I found that mathematics gave me metaphors that helped me understand and process what I'd been through.

Content warning: *This article includes domestic violence and sexual assault.*

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When I was an undergraduate, I was in a relationship with a controlling and jealous boyfriend. The abuse escalated quickly. Eventually I was not "allowed" to spend time with others or go out for any reason other than work or class. He shouted at me for hours, calling me names like "stupid" or "slut" or "worthless." I was walking on eggshells to avoid angering him.

He used threats to control me. I lacked the experience to understand that what he was doing was wrong. In particular, this kind of thing wasn't talked about at my selective liberal arts college. In my mind, the word "abuse" described what happened to poor women or uneducated women, not smart middle-class women like me.

In this context, my math classes were a respite. Class time was my only opportunity to be free. In mathematics class, I didn't have to think about my boyfriend's fits of rage. I could forget about the abuse for a little while by becoming absorbed in analysis or number theory or something else that fully engaged my mind. Mathematics offered me an escape from my unhappiness.

One day a fellow student came to my aid. He knocked on the door of my dorm room while my boyfriend was away. He said, "When I grew up, my dad used to beat up my mom. From what I'm hearing through the wall, I think your boyfriend is abusing you." I completely and totally denied this, insisting that everything was fine. The truth was, I was scared to admit what was happening, even to myself. In spite of my denials, his words started to sink in, opening a crack through which light began to flow. I think of that moment as a turning point, where I learned to tell myself that the way I was being treated was not okay. In the moment, I couldn't say it out loud to my fellow student. He had no way of knowing if he had helped me at all.

In the same way, research in pure mathematics does not always immediately seem useful or important. I think of number theory, once considered the most pure of mathematical subjects, and how it later turned out to have applications in computer science and cryptography. In much the way that my fellow student's words might have seemed to have no effect, pure mathematics may seem pointless to people who are more interested in real world applications. But that student gave me a great gift by sharing those words with me, never knowing if they would have any impact. I am very comfortable doing research that has no apparent real-world applications. Now I also try to do good things for people without expecting an immediate result. Research in domestic violence shows that many victims go back to their abusers more than once in the process of trying to break it off. It can be frustrating for friends and family to watch, wondering why their loved one doesn't just leave. Just as it may take some time to fully appreciate the applications of number theory, it may take time for supportive words to make a visible difference in someone's life.

Another mathematical analogy helped me come to terms with being sexually assaulted by my boyfriend. I spent hours in therapy talking about "the time he had sex with me even though I didn't want to have sex." It was a long phrase that almost became hyphenated by the repetition, "the time-he-had-sex-with-me-even-though-I-didn't-want-to-have-sex." As you can imagine, this is a little unwieldy, but I couldn't manage to call it by any other name. At one point the therapist leaned forward and said, "You mean when he raped you?" It was like a slap in the face. I started to protest, and then realized that my long phrase was almost the definition of rape. I then thought to myself that it was as if I had been talking about "closed and bounded" sets for years, and my therapist had just said, "You mean compact sets?" I would protest that "closed and bounded" was not always equivalent to "compact", but the therapist could point out that we live in $\mathbb{R}^n$, where the Heine-Borel Theorem says they are equivalent. I started laughing as I thought of this analogy, and then I tried to explain it to the therapist. Needless to say, she didn't understand the analogy at all, but she was happy that it made sense to me. I saw that I had been using the long, hyphenated phrase as a way to avoid acknowledging that it was a sexual assault. Thinking about the relationship between "closed and bounded" versus "compact" helped me to see my own traumatic experience more clearly, accept that it had happened, and say the right words out loud.

In general, the times that I am most content are when I am completely absorbed in something. This could be a math problem in which I'm totally engrossed. Sometimes it's when I'm teaching a class, where all my energy is focused on my students and the material, and the outside world fades away. Mathematics has been a source of comfort to me over the years, first as I navigated through a particularly traumatic time, and then in my years of recovery. I feel lucky to have found solace in math to help me through some difficult experiences.

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