Ichingcarpenter (35,560 posts) Tue Jan 24, 2012, 10:44 AM

Math Formula May Explain Why Serial Killers Kil

Researchers have discovered that the seemingly erratic behavior of the "Rostov Ripper," a prolific serial killer active in the 1980s, conformed to the same mathematical pattern obeyed by earthquakes, avalanches, stock market crashes and many other sporadic events. The finding suggests an explanation for why serial killers kill.

Mikhail Simkin and Vwani Roychowdhury, electrical engineers at the University of California, Los Angeles, modeled the behavior of Andrei Chikatilo, a gruesome murderer who took the lives of 53 people in Rostov, Russia between 1978 and 1990. Though Chikatilo sometimes went nearly three years without committing murder, on other occasions, he went just three days. The researchers found that the seemingly random spacing of his murders followed a mathematical distribution known as a power law.

When the number of days between Chikatilo's murders is plotted against the number of times he waited that number of days, the relationship forms a near-straight line on a type of graph called a log-log plot. It's the same result scientists get when they plot the magnitude of earthquakes against the number of times each magnitude has occurred — and the same goes for a variety of natural phenomena. The power law outcome suggests that there was an underlying natural process driving the serial killer's behavior.

http://www.livescience.com/17983-math-formula-explain-serial-killers-kill.html

Dr. Walter Bishop is on top of this

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LonePirate (2,792 posts) Response to Ichingcarpenter (Original post)
Tue Jan 24, 2012, 10:57 AM

1. Thanks for posting the John Noble (as Dr. Walter Bishop) pic.

I love him, his character and his show. He certainly would be able to uncover this formula for serial killers.

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AlecBGreen (3,874 posts) Response to Ichingcarpenter (Original post)
Tue Jan 24, 2012, 11:49 AM

2. sensational headline but here's the real story

"Certain patterns can occur randomly in nature without meaning anything. While it is interesting in itself that the case of this one serial killer fits a power law distribution, it would be incorrect to draw conclusions from that..."

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Ichingcarpenter (35,560 posts) Response to AlecBGreen (Reply #2)
Tue Jan 24, 2012, 12:02 PM

3. Cornell University Paper link

http://arxiv.org/abs/1201.2458v1

Stochastic modeling of a serial killer

M. V. Simkin, V. P. Roychowdhury
(Submitted on 12 Jan 2012)

We analyze the time pattern of the activity of a serial killer, who during twelve years had murdered 53 people. The plot of the cumulative number of murders as a function of time is of "Devil's staircase" type. The distribution of the intervals between murders (step length) follows a power law with the exponent of 1.4. We propose a model according to which the serial killer commits murders when neuronal excitation in his brain exceeds certain threshold. We model this neural activity as a branching process, which in turn is approximated by a random walk. As the distribution of the random walk return times is a power law with the exponent 1.5, the distribution of the inter-murder intervals is thus explained. We confirm analytical results by numerical simulation.

Subjects: Physics and Society (physics.soc-ph); Neurons and Cognition (q-bio.NC)
Cite as: arXiv:1201.2458v1

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SwissTony (2,015 posts) Response to Ichingcarpenter (Reply #3)
Tue Jan 24, 2012, 02:15 PM

4. Garbage in, garbage out

Last edited Tue Jan 24, 2012, 03:07 PM - Edit history (2)

If you put data into a modelling software package, it will provide output. This does not mean the output is valid. In what way does it reflect the the psychological processes within the mind? It doesn't. It imposes a mathematical

construct which has no basis in anything other than abstract models. I could do a Cox regression or an Weibull regression and get some results. Would they be valid? Probably not.

Two other points...

1) looking at some of their graphs in their PDF, I'd wonder about their goodness of fit statistics.

2) simulation is not a method for confirming results. You build many assumptions into a simulation program. You do the best you can, but you know the limitations of your program. They (hopefully) reflect reality, but they are not reality.

3) <insert Spanish Inquisition joke here> Don't do statistics with n=1

Edited once because I can't type and then again because I used square brackets which hid my absolutely hilarious Spanish Inquisition joke. Maybe not so hilarious.

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Ichingcarpenter (35,560 posts) Response to SwissTony (Reply #4)
Tue Jan 24, 2012, 04:03 PM

5. Submit a Paper to Cornell

I look forward to reading it

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SwissTony (2,015 posts) Response to Ichingcarpenter (Reply #5)
Tue Jan 24, 2012, 04:47 PM

6. You think this PDF is a paper???? Get serious.

You have no idea.

Have you ever contributed a paper ro a serious scientific journal?

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caraher (4,828 posts) Response to SwissTony (Reply #6)
Tue Jan 24, 2012, 05:10 PM

7. I think a lot of people don't understand what arxiv is

Cornell hosts the preprint server, but just because you find a paper there does not imply any kind of endorsement of its contents.

Yes, I'd call what you can download from the

preprint server "papers," but what SwissTony is surely pointing out is that they're not peer-reviewed papers, the true "coin of the realm" in science. While a lot of what's available there does get published in peer-reviewed journals, but not everything, and you can't really put such papers on your CV as evidence of scholarly accomplishment.

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mzteris (16,232 posts) Response to Ichingcarpenter (Original post)
Tue Jan 24, 2012, 07:08 PM

8. other papers & background

Simkin papers-
http://www.ee.ucla.edu/~simkin/publications.html

(I don't know if any of these are "good" or not or if the publisher is acceptable or not. Just putting the info out there.)

Roychowdhury: http://www.ee.ucla.edu/people/faculty/faculty-directory/vwani-roychowdhury

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mzteris (16,232 posts) Response to Ichingcarpenter (Original post)
Tue Jan 24, 2012, 07:42 PM

9. well here's some interesting things:

"The problem tackled by the Puget Sound teams asked them to design a mathematical model that would aid police investigators in tracking down serial criminals. The team had to create at least two schemes that would each generate a geographical profile of past crime scenes. After devising a technique to combine the two profiles and factoring in the times of the previous crimes, they had to predict—or at least provide some guidance—as to the likely location of the next incident. The team had to tell investigators just how reliable their method was and provide any appropriate warnings about using the prediction in light of the uncertainties."

http://www.pugetsound.edu/news-and-events/campus-news/details/526/

Rossmo's Formula: using math to find them:
http://geoprofiling.com/wp-content/themes/arjuna-x/images/prosecutor-2003.pdf

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