On the probability of cock-rock being played on Chris's deck under increasing inebriation

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1 Introduction

As individuals get older they often yearn for nostalgic connections to their past. This is a well-established principle that is used, for example, to motivate product purchasing via advertising amongst aging boomers (Hamdani et al. 2020), to share mostly staid, undynamic childhood stories among nursing home residents (Synnes 2015), and even motivating fascist movements through wistful notions of a mostly mythological and idealized past (Stanley 2018).

One major connection to the past is music, of which the topic of nostalgia-*cum*-music is vast and well established (cf. Barrett et al., 2010; Garrido and Davidson 2019). A locally, well-known phenomenon shared among university professors in Harrisonburg Virginia, who are now in their early-40s to early-50s, is the fact that—despite some protestations and denials—80's nostalgic "cock-rock" will eventually be played on Chris's deck as the evening progresses while beers are consumed. This expectation occurs due to beer-infused changes in neurochemistry in the aging adult male that results in the following 1) a yearning for the past, 2) a proclivity to tell inflated stories about past mischievousness and sexual tomfoolery from a time period when the interlocultors were younger and more virile than their current state, and 3) a desire for suitable, over-the-top and exaggerated rock-n-roll (i.e., "cock-rock") to accompany these largely hyperbolic fables of the past.

The issue of what constitutes "cock-rock" is a matter of debate. Many sources attribute the origins of cock-rock to the hip-swaying braggadocio of esteemed rockers Led Zeppelin, who's music is largely rooted in creative and catchy riff-based reinterpretations of blues music from mid-20th century USA. These rockers spawned numerous disciples, of which Gun and Roses is significant. Others argue that cock-rock formally emerged in the 1980s in the USA. The latter argument refers to to musical groups that utilized "hair-metal" and "glam-rock" theatrics that contained priapic displays of technical talent coupled with a pop-music sensibility, of which Motley Crue is significant. This is a matter of on-going debate, at least among the text-threads shared among those who regularly attend gatherings on Chris's deck. That said, all participants in these text-threads agree that cock-rock involves some measure of performative gesticulations, skillful yet prolonged noodling of guitar solos, leaked media stories about sexual conquests, the use of bizarre stylistic devices such as 6-inch headbands and ripped clothing, and of course, heavy guitar riffs that are poorly replicated

by millions of dads who play guitar in their basement and/or underwear to the denunciatory eye-rolls of close kin. It has been estimated that if you watched any musical video between 1985 and 1989, there was a 43 percent chance it would be cock-rock (Anon, 2022). The author of the present study finds cock-rock to be a less than optimal way to round-out the evening.

In what follows, I characterize the mathematical properties of the probability of cock-rock being played on Chris's deck under the influence of increasing alcohol consumption on a given night. Apart from the author, the collective intuition of guests on Chris's deck seems to indicate that this is a rare occasion, and that most evenings start with, and end with, *sensible music* being played. Below, I demonstrate that this intuition is wrong: no matter if the evening starts out with *sensible music*, after n beers are collectively consumed over i time-points, the probability that the evening will end either with Guns and Roses ("GnR" hereafter) or Motley Crue ("Crue" hereafter) blairing from the speakers on Chris's deck is 1. I present an analytical proof demonstrating this to be the case.

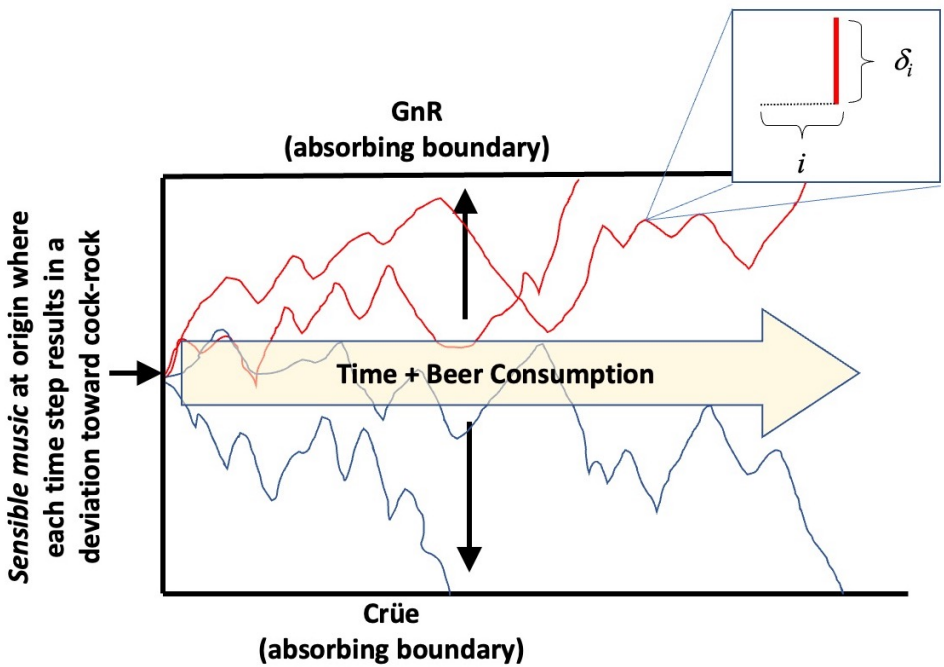

Figure 1: Schematic of a symmetrical one-dimensional random walk with absorbing cock-rock boundaries. Four iterations (squiggly lines) of a random walk are shown for illustrative purposes. At each time-point i, the number of collective beers consumed defines the length of each deviation (δ_i), positive or negative, away from *sensible* music with more and/or stronger beers resulting in larger deviations per time step toward the inevitable cock-rock boundaries.

2 Methods

To demonstrate analytically that cock-rock will be played with probability 1, we can model this as a one-dimensional symmetrical random walk in discrete time. In this derivation, which is taken

from Rice (2004), we begin with *sensible music* at the origin of the random walk (see Figure 1), and at each time step one can deviate toward GnR or Crue. It is important to note that in this model, GnR or Crue, are absorbing boundaries. Once GnR or Crue is selected and broadcasted loudly, it remains broadcasted until police/neighbors complain (rare) or the aging "dad" crowd gets tired and goes to bed by like 11:30pm (common).

At each time-point i we move move a distance δ_i, where values of δ_i are drawn at random from a distribution that is parameterized based on beer-fueled nostalgia. The distance each deviation takes at time-point i is proportional to the magnitude and frequency of beers collectively consumed over time on Chris's deck ($\delta \propto$ A.B.V. and/or number of beers). The total distance, D_n from *sensible music* after n steps is the sum of of all deviations:

$$D_n = \sum_{i=1}^{n} \delta_i \tag{1}$$

To begin, we set *sensible music* equal to 0, and calculate deviations, positive or negative away from *sensible music*. This means that δ_i is drawn at random from a distribution with a mean of zero, thus the expected value of D_n is also zero, reflecting the fact that each draw has an equal chance of deviating toward one or the other absorbing boundary. To find the actual distance that a particular trajectory of draws will traverse away from the origin of 0 (=*sensible music*), we need to calculate deviations from the mean, which is achieved by squaring equation 1:

$$D_n^2 = \sum_i \sum_j \delta_i \delta_j = \sum_i \delta_i^2 + \sum_i \sum_{i \neq j} \delta_i \delta_j \tag{2}$$

Because this is a discrete random walk, we cannot predict any given outcome, but we can model the expected behavior of the system by calculating the weighted average over all possible outcomes. Thus we need to find the expected value of D_n^2, so we rewrite equation 2 as

$$\mathbb{E}[D_n^2] = \sum_i \mathbb{E}[\delta_i^2] + \sum_i \sum_{i \neq j} \mathbb{E}[\delta_i \delta_j] \tag{3}$$

To simplify this equation, recall the first constant rule: $\sum_{i=1}^{N} a = Na$ from which I think we can write

$$\mathbb{E}[D_n^2] = n\mathbb{E}[\delta_i^2] + n(n-1)\mathbb{E}[\delta_i \delta_j] \tag{4}$$

and then, recalling some rules from a statistics class (i.e., $\text{var}(X) = \mathbb{E}(X^2) - (\mathbb{E}(X))^2$ and $\text{cov}(X, Y) = \mathbb{E}[XY] - \mathbb{E}[X]\mathbb{E}[Y]$) that were quickly displaced by better memories or forgotten due to beer, we can rewrite equation 4 as

$$\mathbb{E}[D_n^2] = n\left[\text{var}(\delta) + \mathbb{E}(\delta)^2\right] + n(n-1)\left[\text{cov}(\delta_i, \delta_j) + \mathbb{E}(\delta_i)\,\mathbb{E}(\delta_j)\right] \tag{5}$$

We can simplify equation 5 by noting that each step is independently drawn at random and thus not dependent on any previous steps; this means that $\text{cov}(\delta_i, \delta_j) = 0$. Further, recall that each step has an equal chance of deviating toward one or the other absorbing boundary, which makes $\mathbb{E}(\delta) = 0$. This results in

$$\mathbb{E}\left[D_n^2\right] = n\text{var}(\delta) \tag{6}$$

In equation 6 we see that D^2 is equal to the variance in deviations, δ, times n. We can further make sense of the this result by defining the standard deviation SD_δ of step size as $SD_\delta = \sqrt{\text{var}(\delta)}$ which results in

$$\mathbb{E}\big(\,|D_n|\,\big) = SD_\delta\sqrt{n} \tag{7}$$

Equation 7 shows that the expected absolute distance away from the origin increases with the square root of number of steps. More simply, as more beers are consumed over time, the further one traverses away from *sensible music.*

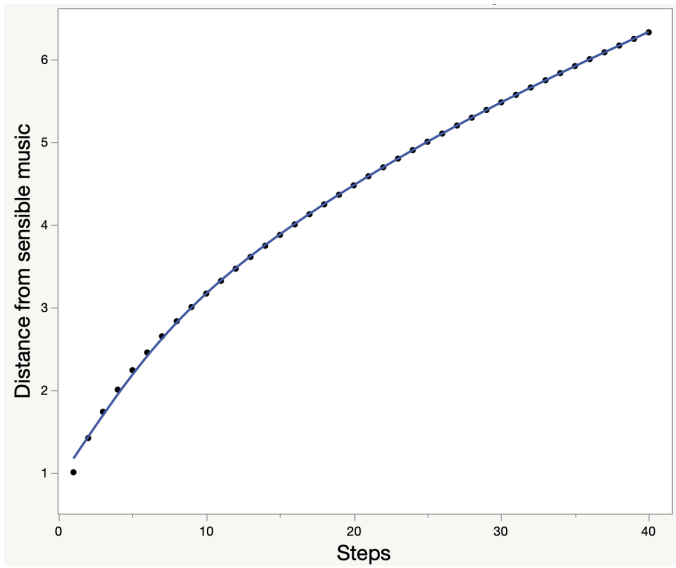

Figure 2: A graphical representation of equation 7, showing that, on average, the distance away from *sensible music* increases as the square root of number of steps taken, recalling that the distance of each deviation per step step is proportional to the number and magnitude of beers collectively consumed on Chris's deck ($\delta \propto$ A.B.V. and/or number of beers).

3 Results

The results above show that distance from *sensible music* increases with the square root of n. This is illustrated in Figure 2 where equation 7 is portrayed graphically.

4 Discussion

In this study, I demonstrated that as more and/or higher alcohol beers are collectively consumed on Chris's deck, the probability that cock-rock will be played is 1. This was modeled as a one-dimensional discrete symmetrical random walk, where cock-rock—here exemplified by GnR and Crue—are absorbing boundaries. This flies in the face of commonsense intuition in that random

walks might just fluctuate around the origin of *sensible music* because the expected change at any time step is zero, independent of the number or strength of beers that are collectively consumed. As equation 7 shows, random walks will always deviate toward cock-rock so long as beers are consumed over time.

A logical question that arises is why cock-rock constitutes an absorbing boundary? That is, once GnR or Crue is reached, why does it stay there? This is largely a question that deserves its own study, but recalling the discussion of the function of nostaliga from above, it seems likely that cock-rock provides the neurological equivalent of recalling a "one night stand" (that may or may not have actually happened in the past) in that it provides a nostalgic substrate that is egotistically gratifying yet ignorable, and requires little cognitive effort engage with in the present. Also, changing tunes at the end of the evening is usually hampered by increasingly bevvied and slightly truculent personal opinions where consensus is rarely achieved.

Are GnR or Crue the only absorbing boundaries available to participants on Chris's deck? The answer to this question is no. They were chosen because they represent two extremes on the cock-rock spectrum. GnR is more rooted in blues-based rock-n-roll that has ties to Led Zeppelin, whereas Crue is rooted in the "hair metal" and "glam rock" genre that was popular in the early/mid 1980s—a time when really good *sensible music* was being created (e.g., early Talking Heads, The Minutemen, Sonic Youth, The Slits, The Fall, etc. etc.). The use of GnR and Crue as opposite endpoints in the random walk is also justified by the fact that the lead singers of these two bands had publicly challenged each other to a fistfight on the analog-broadcasted media venue "Music Television" (known as MTV and pronounced *"em-tee-vee"*); this level of wankish fanfaronade further justifies the mutually exclusive nature of these two types of cock-rock. To be sure, other cock-rock bands have also constituted absorbing boundaries on Chris's deck, such as Whitesnake, Ratt, and Poison, but these latter absorbing boundaries are less "sticky" due to limited hit songs. What is important, and demonstrated here, is that cock-rock is eventually played with probability 1 on Chris's deck under increasing inebriation.

References

[1] Anonymous author. 2022. What is Cock Rock? Hair + Flannel (www.hairandflannel.com/cock-rock/).

[2] Barrett FS, Grimm KJ, Robins RW, Wildschut T, Sedikides C, Janata P. 2010. Music-evoked nostalgia: affect, memory, and personality. Emotion: 390-403

[3] Garrido S, Davidson JW. 2019. Music, nostalgia and memory. Berlin: Springer International Publishing.

[4] Hamdani NA, Permana I, Nugraha S, Maulani GAF. 2020. Nostalgic Marketing: A Study on Baby Boomers Generation. In International Conference on Management, Accounting, and Economy. ICMAE 2020: 381-384.

[5] Rice SH. 2004. Evolutionary Theory: Mathematical and Conceptual Foundations. Sunderland: Sinauer Press

[6] Stanley J. 2018. How Fascism Works. Penguin, Random House

[7] Synnes O. 2015. Narratives of nostalgia in the face of death: The importance of lighter stories of the past in palliative care. Journal of Aging Studies, 34: 169-176.