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The Drunkard's Walk: How Randomness Rules our Lives

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By Leonard Mlodinow. (2008). Vintage Books: New York. (252 pages; $17.50 CND; 15.00 USD).

Should you put your money into a mutual fund that has been outperforming the market for the past twelve years, one that has been lagging behind the rest of the market (but is perhaps due to catch up), or throw a dart at the list of funds and pick the one that the dart selects. If Leonard Mlodinow is right, pretty much any selection has the same chance of success or failure.

Mlodinow's book *The Drunkard's Walk: How Randomness Rules Our Lives*, is a fascinating account of how important random chance is in our lives. Random chance is often hidden by apparent order and skill. In addition, as Mlodinow points out, humans are predisposed to see order and impose order ever when none exist. I have read other books that attempt to discuss probability in ordinary life and even written papers on the topic (see Turner, 1998; Turner, 2000; Turner & Horbay, 2003; Turner & Powell, 2007), but this book is perhaps the most successful at bridging the gap between the scholars who understand this stuff and the general public.

The book discusses the history of ideas about random chance from ancient civilization to modern times. Simple chances such as a coin coming heads up are quite easy to understand but combinations of chances quickly become quite complicated. During the Roman era people understood the idea of a half truth. In Roman law it was believed that two half truths equaled a certainty. Mlodinow points out that in reality two half chances (assuming the chances were indeed 50%), would equal a three quarters truth (1 - .5*.5 = .75). However, something as simple as which is more likely, the chance of rolling a 9 or a 10 with 3 dice, would have been beyond the capacity of anyone in the world to compute until an easy-to-use system of mathematics was developed during the Renaissance. It was in fact not

until 16th century that Cardano started to make any real headway towards an understanding of random chance. Cardano's ideas were then synthesized into a more general account by Pascal in the 17th century. In particular, Pascal developed a triangle based on very simple math that could be used to work out the opportunities for something to occur. The problem is that it was quite tedious to use for complex problems. Working out the opportunities for an event is a key to determining the chance that it could happen. Today factorial mathematics[1] is used to work out the chances of winning a lottery or other probabilities.

The book examines several other developments including ideas that lead ultimately to game theory and statistics and includes short biographies of some famous and some rather obscure mathematicians who contributed to these developments. For example, although Einstein is often quoted as believing that God does not play dice with the universe, the book nonetheless points out that Einstein's most cited work was a 1905 paper on the use of statistics in physics.

In addition, *The Drunkards Walk* examines errors in human reasoning and the psychological illusions that are most often found when people are dealing with random events. This book in fact is relevant to this journal precisely because many of the problems people have dealing with random chance are related to the reasons people keep gambling. The book does not discuss problem gambling, but does discuss the flaws in human reasoning related to the gamblers fallacy and other errors in reasoning.

There were a small number of flaws in the book. One problem I noticed is that he introduces the concept of significance, but does not explain what “significance” means for a couple more chapters. Also I found the book to ramble at times, meandering between the past and the present. In addition, the book ends with a discussion of the emergence of chaos theory in modern mathematics based on the discovery that over time uncertainty accumulates in a manner that makes long term predictions nearly impossible in most human endeavors such as forecasting the weather or the economy. The brief mention of chaos left me wanting more. Finally I found it somewhat frustrating that Mlodinow never clearly distinguished between when a system is entirely random and one that is only partially random. In particular he often seems to attribute all of the variance to chance even when there may be some non-random component to the data. For example, on page 200 he provides a graph of fund manager's relative rank to show that there is little relationship between how a fund was doing from 1991 to 1995 and how it was doing from 1996 to 2000. But in fact in the graph he provides the top 100 ranked funds from 1991 to 1995 were mostly above 0 (average) and the bottom 50 funds were mostly below 0 (average) indicating that success during the two time periods was not entirely random.

Mlodinow is right that randomness plays are larger role in our lives than we might care to admit, but humans rarely experience anything that is entirely random. Although at the atomic level true random chance may dominate, at the level in which we live out our lives, complete random chance is relatively rare. Casinos for example have to take special precautions in order to make dice, roulette wheels, card games and even slot machines random enough to ensure a reliable house profit and protect themselves from skilled players (see Turner & Fritz, 2007; Turner & Horbay, 2004). The rarity of pure random chance in our lives may explain in part why humans have difficulty dealing with random events. Our brains have evolved to sort out the order from a noisy messy background. In so doing, we have not developed a means of perceiving or appreciating pure random chance.

Overall, this book is fascinating but I found myself thinking throughout it that I could have written this myself. A colleague of mine has politely pointed out that I could not, by which she meant that I could not have written such an entertaining and easy to read book. Perhaps she is right. This book is geared towards the general public and Mlodinow manages to bring very complex mathematical concepts down to a level that can be understood by the average person. Mlodinow has made the mathematics of random chance interesting by filling his book with real world examples such as wine ratings, sports records, mutual fund performance, film ticket sales, school grades, and political polls. The Drunkard's Walk is a potentially useful source of information to counselors who treat people with gambling problems or recovering problem gamblers who are interested in improving their own understanding of random chance. It may also be a valuable source of information to people who wish to develop prevention materials.

Notes

[1]The factorial of a number (e.g., 7) is the product of all positive integers less than or equal to 7 (e.g., 7! = 7*6*5*4*3*2*1) = 5040. This means there are in fact 5040 different ways of combining the numbers from 1 to 7. A lottery in which the player selects 6 numbers out of 49 numbers has a probability of ((49 !) / ((49 - 6) !)) / (6 !) = 13,983,816 or 1 in 14 million.

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