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*How likely are “streaks” in sports?*

In 1941, Joltin Joe DiMaggio’s fifty-six game hitting streak became the most exceptional achievement in baseball history and remains so to this day. This extraordinary accomplishment has made DiMaggio a legendary sports icon, and many say it will never be matched. Joltin Joe had a great baseball skill set and ended up with .325 career batting average. However, his talent is not unparalleled in the game of baseball. There have been numerous great players with similar statistics that have failed to accomplish something even close to DiMaggio’s 1941 feat. Pete Rose and Wee Willie Keeler are second with forty-four game hit streaks (Gould). Was DiMaggio’s hit streak due purely to his ability? Did he just have the “hot hand?” Or was his triumph a completely random stroke of luck?

Leonard Mlodinow addresses these issues in his July 3, 2009 *Wall street Journal* article “The Triumph of the Random – From banking to baseball, winning streaks owe much to the laws of chance.” As the title suggests, the article discusses how streaks are largely due to randomness and chance, contradictory to many people’s perception. Of course, ability plays a role in our careers, but luck is just as important, if not more, of a factor then talent. A prime example of this is actors. There are many very talented actors, some of which are lucky enough to be in the right place at the right time that lead them to land prominent roles in films, thus acquiring fame and notoriety. Many actors that haven’t been recruited by the “right” talent agent, or haven’t had the opportunity to be at a certain audition, are often just as talented, if not more, than some of the actors who have had more successful careers. Talent alone does not define one’s career; randomness can also have a very large impact.

We can examine DiMaggio’s streak and try to explain it using chance models like box models. There would be a box with tickets for getting a hit, and tickets for not getting a hit. DiMaggio had about 4 at bats per game and a career batting average of .325, so there would have to be one ticket in the box representing getting a hit and two tickets in the box representing not getting a hit. Then there would be trials done of 4 draws with replacement to simulate a game for Joltin Joe. This process can be repeated to simulate how likely it is for a guy with DiMaggio’s numbers to achieve a feat as incredible as his. One study, performed by Samuel Arbesman and Stephen H. Strogatz of Cornell University, had a computer generate a mock version of baseball from 1871 to 2005, based on player’s actual statistics in each year. They repeated the process 10,000 times, generating 10,000 parallel histories of the sport. Their conclusions found that 42% of the simulations had a streak of DiMaggio’s length or longer. The longest streak was 109 games, the shortest, 39 games (Mlodinow). According to this study, one might conclude that it is very likely we will see a streak similar to DiMaggio’s in the future. However, these models can be misleading. There are many situations in a baseball game that can’t be fully accounted for in a box model or a study like the Cornell professors’. What if the hitter is playing during a day or night game where it affects how well he can see the ball? What if he is facing a left or right-handed pitcher? Do you give the batter a fixed batting average for the whole season, or game to game depending on these factors? How do you deal with the discrepancy between walks and at-bats? Some of these factors may average out over time, but it takes away from the precision of the study. “There are many subtleties in randomness,” (Mlodinow) so these studies cannot be completely reliable. They do, however, conclude that chance, along with skill, play a major role in producing extraordinary accomplishments.

Many human qualities such as hard work, persistence and dedication are not taken into account in these probability models. Another one of the great streaks in our nation’s pastime is the “Iron Man” streak of Cal Ripken’s 2,632 consecutive games played. This is a phenomenal feat that lasted nearly 17 years. Ripken was an exceptional baseball player, one of the greatest to have ever played the game. He had incredible talent. Maybe more amazing was his toughness, both physical and mental, and his perseverance. He was lucky that he did not ever receive a major injury during his streak, which makes his streak incredible. His intangible qualities of hard work and dedication to the game and his team make his streak quite possibly unbreakable. A probability model may be able estimate the probability of Ripken’s streak occurring with randomness and a person of his talent and skill; however the intangible human elements that people like Ripken possess cannot be accounted for by the probability model.

Some people may say DiMaggio just had the “hot hand;” that he just got hot, and couldn’t be stopped. Similar to basketball when a player makes basket after basket, some people may claim DiMaggio’s confidence was high and he got on a hot streak getting hits game after game. The only problem with their claim is that there is no such phenomenon as the “hot hand.” This can be explained by tossing a weighted coin. For example, if a 70% free throw shooter in basketball makes 10 free throws in a row, people would see this as a sign of improved ability. But if a weighted coin supposed to land on heads 70% of the time, lands on head 10 times in a row, few people would see this as a sign of improved skill. The “hot hand” phenomenon does not exist. The hot streaks can be attributed to the randomness of tossing a weighted coin. This is just one way that human beings mis-estimate the likelihood of streaks.

Humans are not built to accept the power of randomness. We sometimes overanalyze patterns in trying to formulate conclusions from certain evidence. Often, these patterns are just due to randomness. Our problem is that we want to have control over everything and know the reasons for why everything happens. “DiMaggio’s streak affects us because we all appreciate struggle and effort, triumphing despite huge odds. The notion that we might not have control over our environment, on the other hand, causes us to shudder” (Mlodinow). People are often remembered for incredible achievements that stand out in memory. Humans tend to remember things that have emotional influence, such as DiMaggio’s streak, and we often give unwarranted importance to vivid memories. This is known as the availability bias, and it is why we humans often end up overestimating probability. These effects lead humans to habitually mis-understand the likeliness of streaks. However, “extraordinary events, both good and bad, can happen without extraordinary causes,” (Mlodinow) and so people must not forget to remember the ever present factor of randomness.

Leonard Mlodinow sums everything up wonderfully on page 11 of his book *The Drunkard’s Walk* when he states, “A lot of what happens to us – success in our careers, in our investments, and in our life decisions, both major and minor – is as much the result of random factors as the result of skill, preparedness, and hard work. So the reality that we perceive is not a direct reflection of the people or circumstances that underlie it but is instead an image blurred by the randomizing effects of unforeseeable or fluctuating external forces. That is not to say that ability doesn’t matter- it is one of the factors that increase the chances of success – but the connection between actions and results is not as direct as we might like to believe. Thus our past is not so easy to understand, nor is our future so easy to predict, and in both enterprises we benefit from looking beyond superficial explanations.”

Although we humans habitually underestimate the effect that randomness has in our lives, it is one of the major influences in our careers. Talent, ability, and dedication are very important elements in defining one’s career, but chance and luck also can have major impacts. The probability models do not account for certain human qualities that can play key roles in streaks such as Joltin Joe DiMaggio’s, which can lead us to mis-estimate the chance of a streak like that occurring again. I believe that his streak will one day be broken, but it will take an incredible combination of talent and luck to accomplish this feat because “Joe DiMaggio accomplished what no other ballplayer has done. He beat the hardest taskmaster of all, a woman who makes Nolan Ryan's fastball look like a cantaloupe in slow motion—Lady Luck” (Gould).

**Works Cited**

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