Matthew effect in sports

Start

Matthew Effect

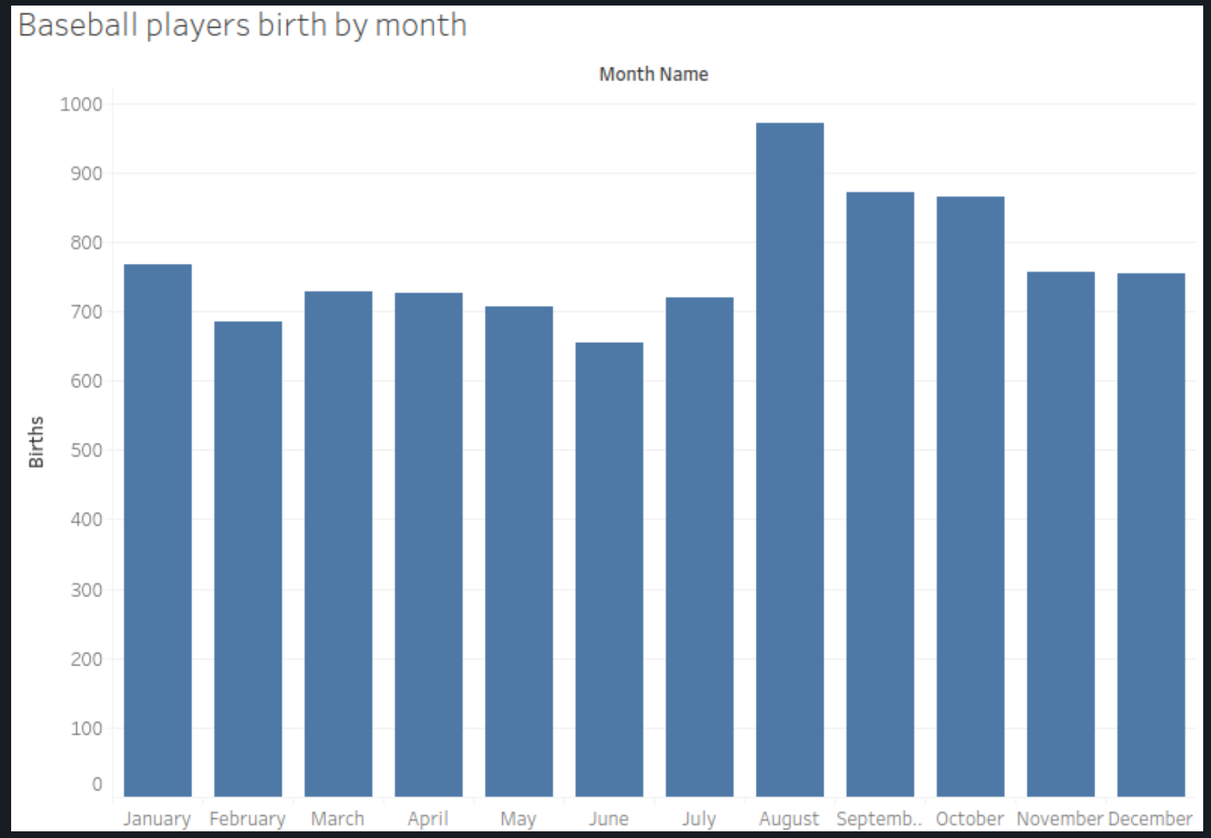
Named by Robert K. Merton after Matthew 25:29: "For to everyone who has, more will be given, and he will have abundance; but from within him who does not have, even what he has will be taken away".

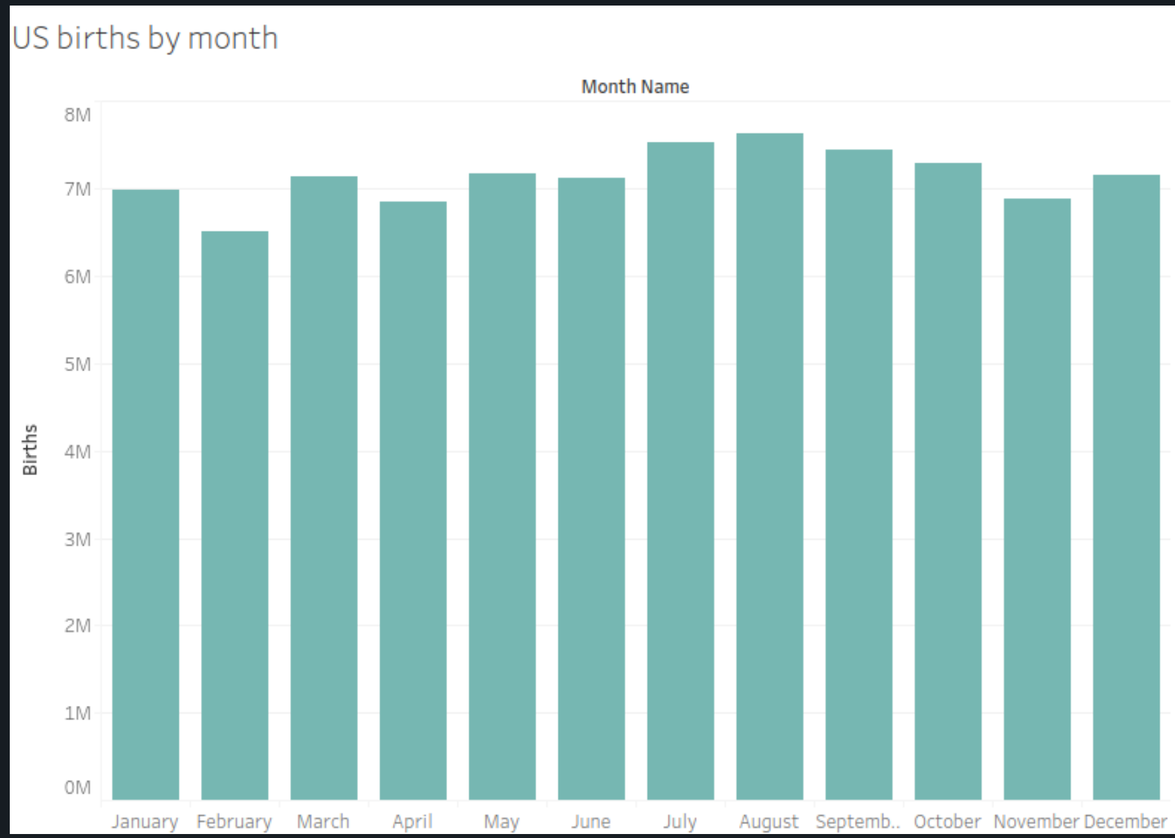
This effect has been observed in different contexts; social inequality, if you were born poor, it is more like that you will die poor.
Education context, if you didn't receive enough education because of your family situation, or you were born at certain months of the year, you will be less prepared during your education.

Matthew Effect in sports

Let's compare this effect in the sports context within the US. We will be using different months as reference VS the US births during those months. Baseball will be our main reference, but basketball, hockey and football will also be considered.

Baseball births VS US Births





Baseball player VS US births, June-August

Group A: baseball players born in June-August.
Group B: US people born in June-August.
P-Value is greater than 0.05, so it is a great chance of becoming a baseball player if you were born in any of these months.

Two Sample z-Test for Proportions

Please Enter Data in Blue Cells

Inputs	
Group 1 Observed	2346
Group 1 Count	9208
Group 2 Observed	22274496
Group 2 Count	85712738
Confidence Level	0.95
Type of Test	p1 ≠ p2

Check Requirements (all ≥ 10?)	
First Sample	2346.000
	6862.000
Second Sample	22274496.000
	63438242.000

Descriptive Statistics			
Group 1 Proportion Estimate	Group 2 Proportion Estimate	Difference of Group Proportions (point estimate)	Standard Deviation of the Proportion Estimate
0.255	0.260	-0.0051	0.0045

Two-Proportion z-test			
Null Hypothesis: H0: Group 1 prop. = Group 2 prop.			
z	P-value	Confidence Interval for p1 - p2	
-1.115	0.265	-0.014	0.004

Baseball player VS US births, September-November

Group A: baseball players born in September-November.
Group B: US people born in September-November.
P-Value is lower than 0.05, so it is a small chance of becoming a baseball player if you were born in any of these months

Two Sample z-Test for Proportions

Please Enter Data in Blue Cells

Inputs	
Group 1 Observed	2492
Group 1 Count	9208
Group 2 Observed	21618654
Group 2 Count	85712738
Confidence Level	0.95
Type of Test	p1 ≠ p2

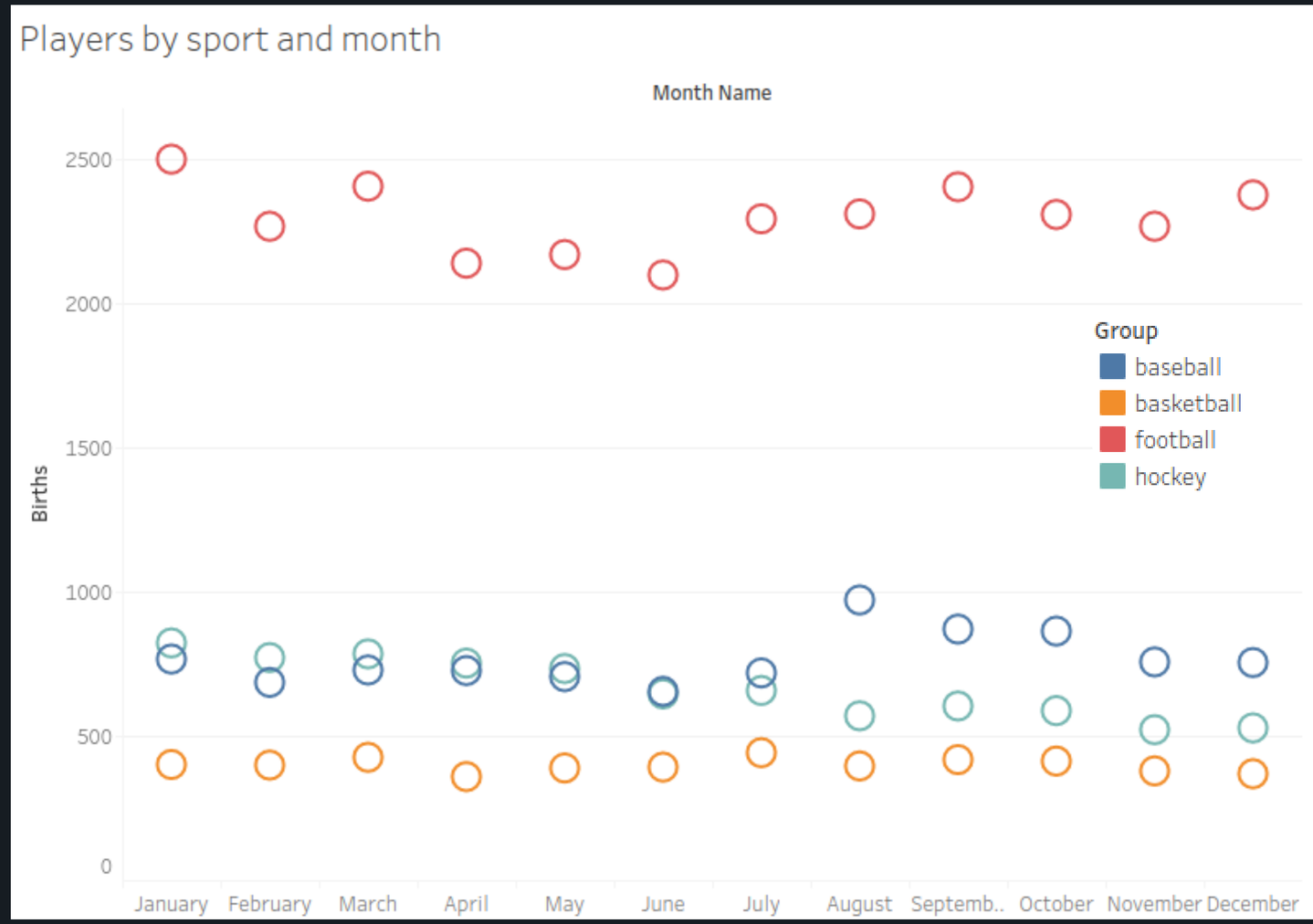
Check Requirements (all ≥ 10?)	
First Sample	2492.000
	6716.000
Second Sample	21618654.000
	64094084.000

Descriptive Statistics			
Group 1 Proportion Estimate	Group 2 Proportion Estimate	Difference of Group Proportions (point estimate)	Standard Deviation of the Proportion Estimate
0.271	0.252	0.0184	0.0046

Two-Proportion z-test			
Null Hypothesis: H0: Group 1 prop. = Group 2 prop.			
z	P-value	Confidence Interval for p1 - p2	
4.068	0.000	0.009	0.027

Sport players by month

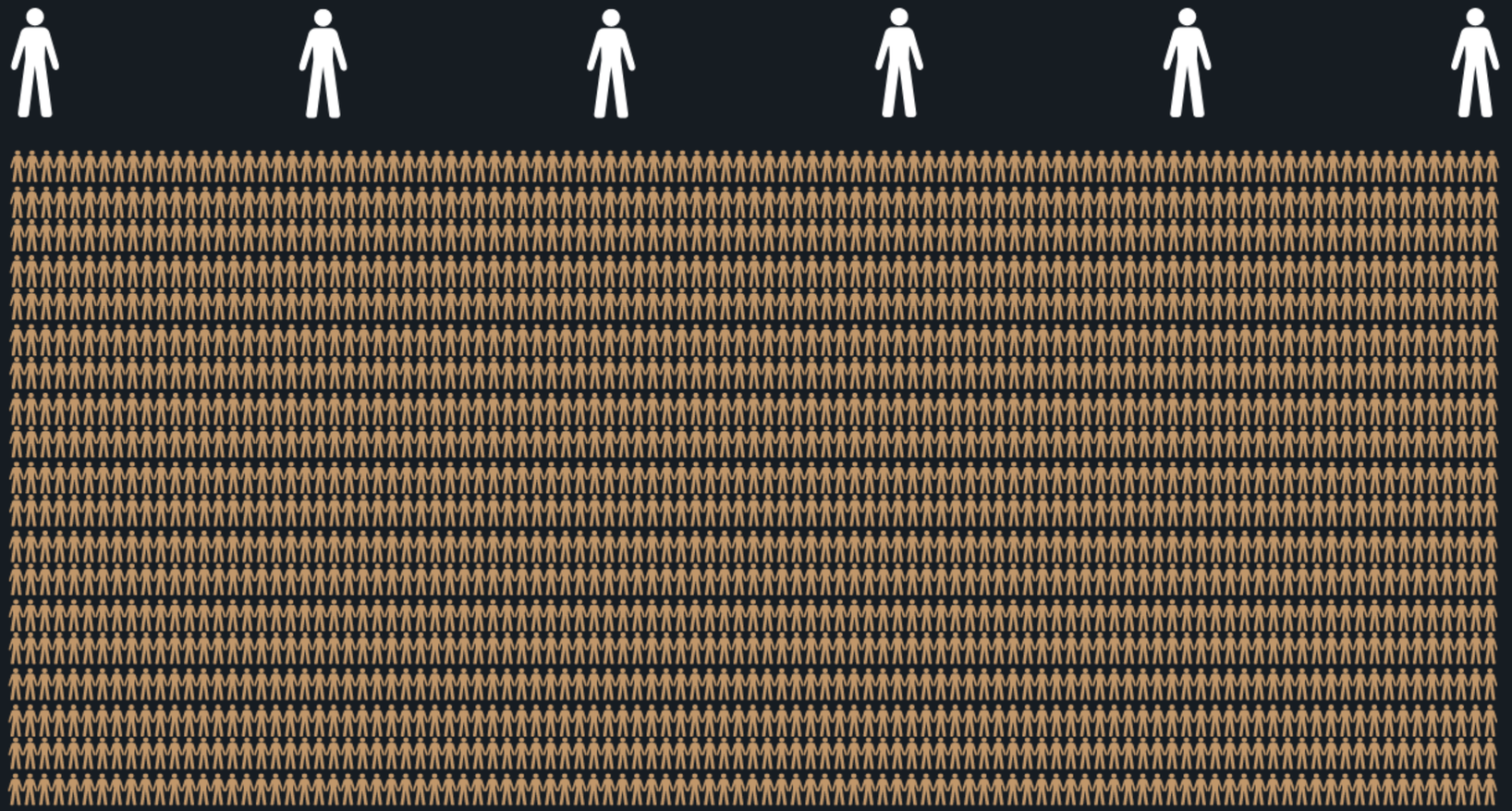
Each sport has a cutoff date, this can be an advantage to many aspirants.
Hockey - December, 31
Baseball - July, 31
Football - July, 31
Basketball - August, 31
We can use hockey as reference: most of the players were born in the first 3 months of the year and, from August there's an interesting decline in the amount of players.



Lowest probability

Group	Month Name	Births	US birth (month)	Probability	Prob %
baseball	June	655	7122586	10874	0.009196098
basketball	December	369	7155101	19391	0.00515716
football	June	2100	7122586	3392	0.029483673
hockey	December	528	7155101	13551	0.007379351

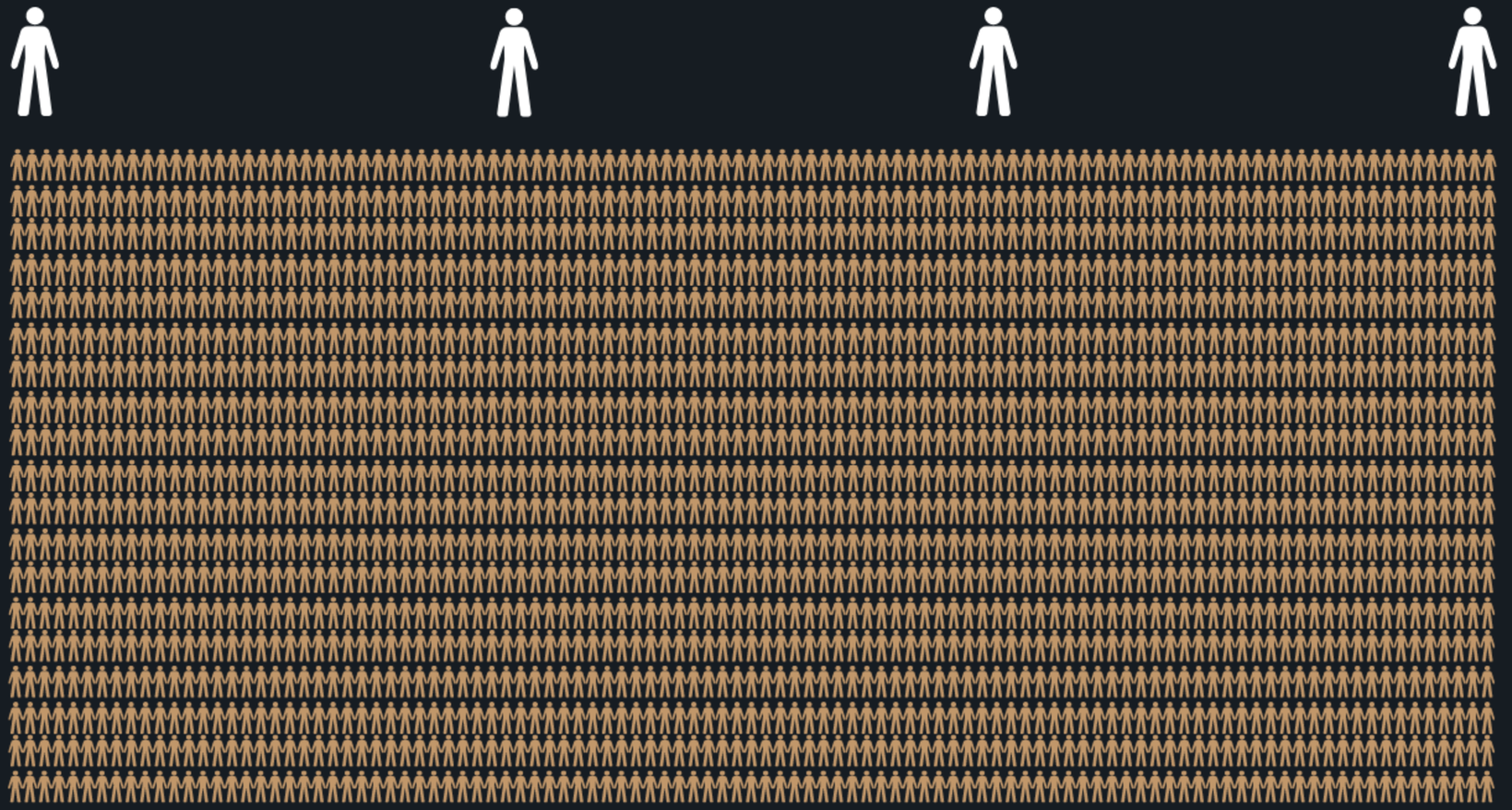
These are the months with the lowest probability of becoming a professional player. Using the probability of baseball, 1/10874, only around 6 persons out of each 1957 persons born in June will make it.



Highest probability

Group	Month Name	Births	US birth (month)	Probability	Prob %
baseball	August	972	7624626	7844	0.012748166
basketball	February	399	6511697	16320	0.006127435
football	January	2502	6979322	2789	0.035848754
hockey	February	772	6511697	8435	0.011855588

These are the months with the highest probability of becoming a professional player. Using the probability of baseball, 1/7844, only around 4 persons out of each 1957 persons born in August will make it.



Analysis

As mentioned in the previous slides, the month you born can affect your probabilities of becoming a professional player, of course it depends on different factors, but as in baseball, despite of having lower probability of becoming a professional, more people who were born in June make it, compared than those who were born in August, with a higher probability less people make it.
Matthew effect was also demonstrated for hockey players, there's a higher probability of becoming a professional if you were born in February than if you were born in December, since the cutoff date is December, 31, so the earliest of the year you were born, the earliest you can prepare to play hockey.

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End