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Advanced Placement Psychology

Chapter 19: Statistics

(**http://www.ApPsychology.net**)

- **Percentile Rank –** A percentage that describes your rank among those also being evaluated. I.e. if your percentile rank on a test is 90, then your score is higher than 90% of the class. It is impossible to get 100% percentile rank because you cannot get higher than everyone in the class, including yourself.
- **Mean –** The average score. Add all the numbers up and divide by number of terms. The **mean** of {2,2,3,10,98} is 23.
- **Median –** The middle point of all the terms such that half is above the number and half is below the number (50^{th} percentile). Arrange the number from highest to lowest or vice versa and find the number in the middle. The **median** of {2,2,3,10,96} is 3.
- **Mole** – The number that occurs the most. Count to see which number appears the most. The **mode** of the {2,2,3,10,98} is 2.
- **Range –** The range of the scores is the difference between the highest number and the lowest number. The **range** of GPA score is from 0.0 to 4.0.
- **Standard Deviation** – A measurement of how far scores differ/deviate from the mean. The **standard deviation** of {5,6,5,6,6,7,5,4} is very low because terms hardly deviate from the mean of 5.5. Whereas, the **standard deviation** of {5,10,8,18,-6,5,-7,22} is high.

Find the **Standard Deviation** of {2,3,3,4}	
(1) Find the **mean.**	(2+3+3+4)/4 = 3
(2) Subtract the mean from each term and square it.	$(2-3)^2=1$, $(3-3)^2=0$, $(3-3)^2=0$, $(4-3)^2=1$
(3) Find the **average** of the deviations from the mean.	(1+0+0+1)/4 = 0.5
(4) Square root the average and that's the standard deviation	(0.5)^1/2 = 0.7071 **Normally this number should be rounded to the same decimal place as the data. But 0.7071 is shown for better understanding.** **0.7071 → 1**

- **Normal curve** or more commonly known as the *bell curve* is a distribution graph that dictates 68% of the scores should circa the mean. More specifically, 68% of the scores should fall within 1 standard deviation and 95% should fall within 2 standard deviations from the mean.
- **Scatterplot –** A graphical representation of data by usage of dots. The degree of cluster or formation of a slope can dictate the *correlation* between the two variables.
- Correlation **–** The relationship between 2 events. I.e. Traffic accidents increase with increasing temperatures; businesses drop as Christmas ends.

Correlation Coefficient – A proportional number that measures correlation – how strongly two events vary together.

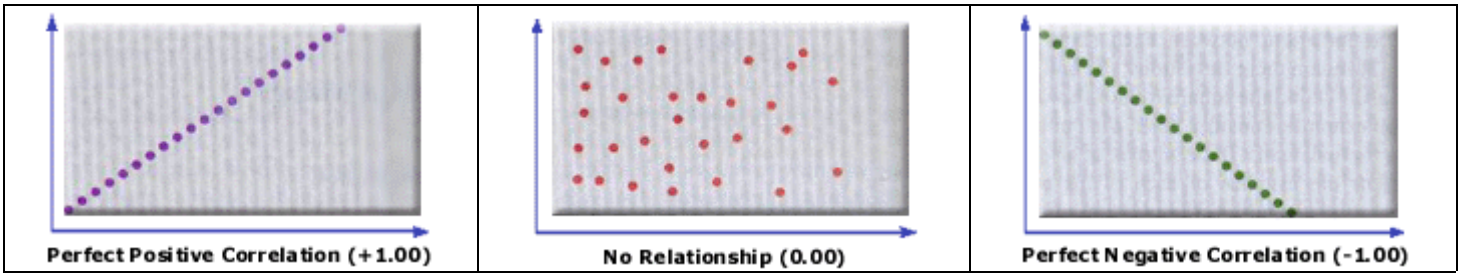
- *Positive Correlation* – The two events increase and/or decrease together. For example, increasing study time positively correlates with increasing grades or decreased food consumption positively correlates with decreased excitability. Positive correlation coefficients are positive numbers ranging from 0.00 (no correlation) to 1.00 (perfect correlation). In a scatterplot graph, *a positive correlation exists if a positive slope is seen.*

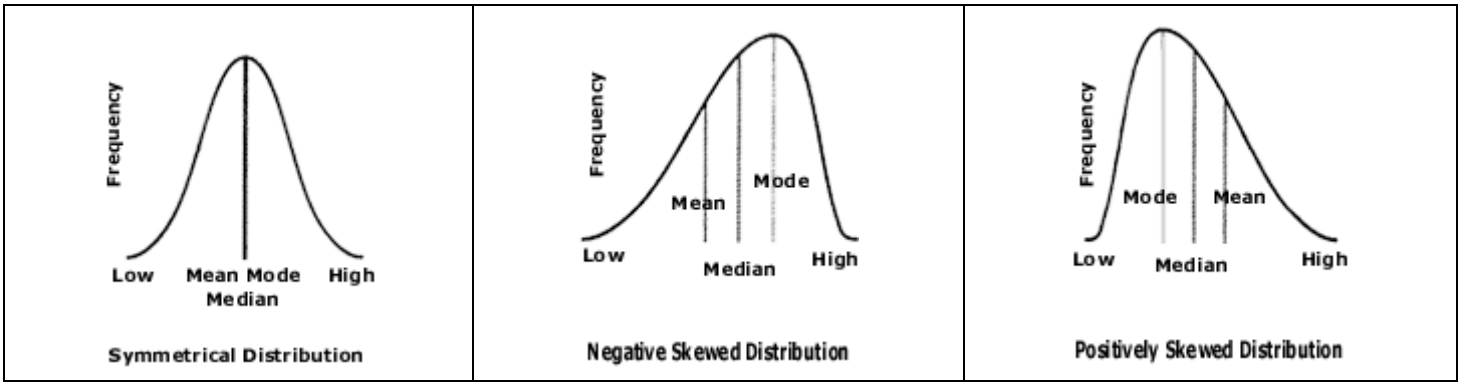
- *Negative Correlation* – One event increases and the other decreases or vice versa. For example, decreasing number of hours of sleep negatively correlates with increases traffic accidents or increasing alcohol consumption decreases alertness. Negative correlation coefficients are negative numbers ranging from –1.00 (perfect correlation) to 0.00 (no correlation). In a scatterplot, *negative a correlation exists if a negative slope is seen.*

- ** Be sure to remember that CORRELATIONS DO NOT NECESSARILY MEAN CAUSATION. If car accidents increase with increasing temperatures, it does not necessarily mean that hot temperatures cause more traffic accidents!!*
- ** Be aware of ILLUSORY CORRELATION – seeing relationships between something when there is none. If you believe that black-colored dogs are more aggressive than white-colored dogs, then you will be more likely to notice and recall events where black-colored dogs show aggressiveness to confirm your belief (also know as "self -serving bias").*

- **Regression toward the mean** – Tendency for extreme values to go back ("regress") to the average value (mean). I.e. If you normally get 80% on your tests and suddenly you got an extreme (unusual) score of 50%, then on your next test you are likely to get around 80% again.
- **Statistical Significance** – A measure of how likely an event is due to chance alone. I.e. If average marks concerning two classes are statistically significant, then the marks are actually different, not due to random chance or sampling errors. Statistical significance is usually determined by mathematical analysis of the samples.

Graphs (Be Aware Of)





Bibliography

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