AP® Psychology
2003 Sample Student Responses

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Statistics are often very important in quantitative data collection and analysis, particularly in standardized tests such as intelligence tests.

One important statistical measure ~~of~~ group is the measures of central tendency, or averages. The three most notable are the arithmetic mean, median, and mode. The mean, which is found by taking the sum of the data set and dividing by the number of data points, is the most common ~~form~~ form of an average. Although means are a good way to determine the general "weighted midpoint" of a set of data, they can be easily altered by a few unusually high or low data sets, and become unusually large or small. The median is the middle number in a data set sorted in ascending or descending order. On even-numbered quantities of data, the average of the two middle numbers in the sorted set is used instead. Although less affected by outliers and ~~error~~ ~~in~~ unusually high or low data points, the median is ~~unreliable~~ not as precise a measurement as a mean or central tendency in that it ~~is faulty~~ may be very high or low due to simply the frequencies of the data points. The mode is simply the most common data ~~point~~ value in terms of frequency. For instance, the series {1, 2, 2, 3} would have a mode of two, since there are two twos and only one of the other values.

A distribution can be skewed when it deviates from the standard normal curve. A skewed distribution will have a large number of either high or low values, as compared to the mean ~~range~~, and ~~not~~

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predictions from standard deviation. Distributions which are unusually large compered to a normal curve are described as positively skewed, while unusually small ones are described as negatively skewed.

On a normal distribution curve, the mean will be at the apex and maximum point. Indeed, the curve is based on the mean as the midpoint. While the median and mode could possibly be just about anywhere on the curve, they tend to cluster around the mean as well, since all are measures of central tendency, or midpoint.

In contrast to this is a positively skewed distribution. In this, ~~the mean is lower than the peak of the distribution curve, to the left, and~~ the median and mode are more likely to be larger, and more in the positive direction. The mean may be in the middle of the distribution or more positive, but will not be at the apex of the curve.

The Wechsler intelligence test is a test for which the scores are normally distributed with a mean of 100 and a standard deviation of 15. This means that the bulk of the scores on the test will be between 85 and 115, about 70%, while about 93% of all scores will be between 55 and 145.

If, between two groups, the mean score for group I is lower than group II, it is still possible for an individual in group I to have tested higher than in group II. This is because a mean, though a generally useful measure of central

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tendency says nothing about ~~or~~ a particular score, only the entire set of data. Additionally, since means can be altered by unusually large or small data values, they are also not a fully reliable measure of even group performance, let alone individual performance. An extremely high score and an extremely low score would average out in a mean to a middling mean, and extremes can be present even in a low-mean group of data.

Periodically, norms for standardized testing are re-normed, or updated. This is because the average score on a test is supposed to be indicative of an average member of the tested population, over time, this norm may fluctuate. Indeed, over the past few years, standardized test scores have risen gradually. This may be due to a variety of factors such as increased preparation, variation between generations, and greater emphasis on test material. Since standardized tests are meant to indicate performance compared to one's peers, the average score must be altered to account for a changing target population.

Oftentimes, there have been accusations of bias against a particular group by intelligence tests. ~~Then~~ To confirm this, several things can be done. The easiest would be to try and correlate a particular group difference or trait with a negatively or positively skewed distribution. If scores on a test for a particular test group do not show

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a normal distribution, a bias may be present.

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I. There are three ways to measure central tendency. They include mean, median, + mode. The mean is the average of all of the numbers. You would find this by adding up all of the numbers then dividing the sum by the amount of numbers (e.g. 9, 7, 5, 6, 5 -> 9+7+5+6+5=32 -> 32/5=6.4 which is the mean). The median is the middle number when put into order from least to greatest or vice versa. The mode is the most ~~free~~ repeated number in the results.

A skewed distribution follows no set pattern. For example, a psychology classes test scores are: 50, 32, 96, 70, 64. None of these grades are related. A normal distribution will make a bell curve if graphed. For example, another Psychology classes test scores were: 60 75 80 76 61. So the ~~average~~ mean will be somewhat accurate. A positively skewed distribution is when the results are closely related (e.g. 91, 92, 94, 97.). For this, the mean, median, + mode will be very accurate. On a normal distribution, the mode will not necessarily reflect the test scores

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+ the median will be close to the mean.

In an intelligence test where the mean is 100 + the standard deviation 15, the results are very accurate. This means that half scored at or below 100 + half scored at or above 100. This test has both reliability + validity

An individual in group 1 which has a mean of 100 can score higher than the mean for group 2 which is 115. Since we don't have the scores, it can't be seen, but suppose some people scored 120 which is above average, however several people scored in the 40s which is way below average. Since the mean is an average of the whole group, those low scores will bring the high ones down.

Standardized test are often updated to keep up. This is because new discoveries are being made, new technology, + more is being taught in schools. If they were not updated

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they would be considered biased. Intelligence tests could be considered biased for many reasons. The main two are the validity & reliability of the test. To be accurate, it must measure correctly what is supposed to & get accurate reliable results. If an academic math test asked automobile questions it has lost its reliability & its validity. It doesn't measure math skills therefore it can't get reliable results & is biased.

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median is the middle number. mode is the average of all the numbers. mean is the highest number. A test must be reliable, standardized, and has to be relavent.

Reliable is when a test taker can take it more than once and get the same, or nearly the same, score. Standardized so that a group ob people can take it and there scores can be matched up against the original. Relavent so that the test matches what the group is supposed to know.

If the highest in group I is 100 and in group II 115 it is ~~still~~ not possible for an individual to have a higher mean in group I than group II. 100 is the highest score in group I which is lower than ~~the~~ 115 in group II there for group I can not have a higher mean.

Norms for standardized test change because social norms change. The cost change from 1985- 1995 and so does style. If the norms for test didn't change, the tests would be inaccurate.

If an intelligence test gives more questions on one subject than another it could be biased.

If an intelligence test doesn't take into account blind people and give brale it could be biased. If an intelligence test doesn't take into account different cultural norms it could be biased. Also biased w/ age, race, & gender.

As of right now there is no sure way

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to test intelligence therefore almost, if not all, intelligence tests must be biased.