

Statistics are dangerously convincing because of their ability to associate information with patterns and shapes, allowing the viewer to simplify and visually compare and contrast on the information given. Statistics provide simple mathematical patterns and visual comparisons on the information, triggering emotional and perceptual understanding upon viewers. Statistics however make generalizations, and is usually formed for a purpose whether it is to support one side of an argument or just to present useful data. This makes them inaccurate. Statistics can contain many biased opinions and generalization errors that are done unintentionally and intentionally to influence the viewer's understanding of a subject. If viewers do not approach statistics with skepticism and critical thinking, it is easy to become persuaded by biased opinions of the creator. We must ask ourselves some basic critical questions in order to determine whether or not the statistical evidence given to us is factually accurate. Statistics are helpful in providing powerful interpretations of a truth, however statistics can also provide convincing illusions distant from the truth that can be used to distort our understanding.

Statistics are never able present the absolute truth because they are generalizing the information they attain. The population of a country for example, changes every moment due to deaths, births, and immigration. We cannot present the actual total population of a country; therefore we must learn how to make accurate assumptions when creating statistics on a country's population. This is also known as Demography. In Geography, I learned that the methods for demography might include finding the average number of people in one household; then manipulating that estimated number to find a

country's population. Since the foundations of our calculations are based on estimates of the absolute truth, the errors of our assumptions will magnify when this information is being manipulated. These errors are always apparent because all measurements cannot be absolutely accurate; therefore we often display "error bars" in our calculations and graphs whether the range of error is one nanometer from the absolute truth, or 5000 people from the absolute truth. Although Statistics cannot provide us with the absolute truth, they are still useful and correct if they are close to the absolute truth. Statistics become untrue and misleading often when the error bars are too big, which causes inaccuracy.

Statistics however often help provide powerful interpretations when it comes to generalizing information because they are able to allow the viewer to see shapes and patterns by using graphs that may not be apparent when interpreted just as numbers. I personally for example would have little or no reaction whatsoever if someone was to tell me that China has a population of 1.3 billion<sup>1</sup>. But if someone were to tell me that, China's population is 43 times greater than that of Canada, then I would be amazed by the astonishing comparison. These statistics help bring awareness to the reality of China's population crisis to the world and the urgency to implement the one child per family rule.

Statistics are also used to help bring awareness to local issues such as drunk driving. Mothers Against Drunk Driving (MADD) for example often uses statistics to provide emotional messages to stop drunk driving. According to data from the National Highway Traffic Safety Administration (NHTSA), in 2003, 17,013 people were killed in alcohol-related crashes. These deaths constituted approximately 40 percent of the 42,642

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<sup>1</sup> <http://archives.cnn.com/2001/WORLD/asiapcf/east/03/27/china.census/>

total traffic fatalities.<sup>2</sup> This shocking information helps limit and control drink and driving accidents due to its horrific statistics on the number of fatalities to its viewers.

Upon close examination however, we can conclude that the information given by the NHTSA is apparently inaccurate. The high percentage of 40 percent of all traffic fatalities refers to accidents in which there was “believed” to have been some alcohol consumed by anyone associated with the accident. For example, an accident is still alcohol-related if a person who was believed to have consumed any alcohol is stopped at a red light and is rear-ended by a sober driver. The NHTSA converts these “alcohol-related” fatalities into reports of drunk driving deaths by changing "alcohol-related" in to "fatalities due to drunk driving."<sup>3</sup> This change of wording creates factually incorrect statistics for NHSTA to use as powerful propaganda to its audiences. Organizations often use language to confuse and distort our understanding of a subject. NHSTA uses this method purposely to distort our understanding of drunk driving because their goal is to acquire statistics that bring about awareness to the dangers of drunk driving. An organization’s strong belief in one side of an issue can cause them to use various methods to distort our understanding of the subject.

It is often easy and tempting for organizations such as MADD to use biased methods to collect data. I learned in history that due to previous beliefs in white supremacist and social Darwinism, many researchers in the past have tried to prove that Caucasians were racially superior by measuring the size of people’s heads. They were very biased and racist in their methods of collecting statistics because they often discarded the measurements of those who had bigger heads and that were not Caucasian

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<sup>2</sup> <http://www.madd.org/stats/0,1056,1112,00.html>

<sup>3</sup> <http://www2.potsdam.edu/alcohol-info/Controversies/1055266742.html>

because it contradicted their hypothesis. This forms biased statistics that use improper methods to acquire data on an issue to distort our understanding.

Statistics however are often very useful when it comes to business and real estate. Statistics are often helpful in providing insight when purchasing homes, or investing in real estate. Stocks often provide accurate information on a company's quarterly or annual profit. Statistics in business also help owners or executive shareholders of a business to analyze their company's situation, and helps allow for improvement in consumer products by analyzing statistics in consumer reactions.

Statistical distortion however can still exist. The famous Enron scandal is a perfect example of statistical distortion in business. In October 2001, Enron announced to the public that its company was actually worth \$1.2 billion less than reported previously. The Securities and Exchange Commission did further investigation on Enron and discovered that Enron's provided incorrect statistics and lied about their company's value to conceal the company's financial situation and its debts to shareholders.<sup>4</sup> Producing false statistics is dangerous to an organization, however it is effective if the audience trusts the organization and does not approach the statistics with skepticism.

Sometimes, even the art of presenting factually correct statistics can distort our understanding. For example, if a landlord was attempting to persuade its buyer that his or her property's value has increased much more drastically than other properties, a landlord may use optical illusions to deceive a buyer's perception. This can be done by reducing the ranges of the Y-axis on a graph that represents the landlord's property; giving the impression of a steeper climb of property value over a period time than the other. The

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<sup>4</sup> <http://news.bbc.co.uk/1/hi/business/1780075.stm>

information is correct according to reason, however by confusing our perception by the arts (drawing steeper trend lines), our knowledge on the subject is distorted.

Although all statistics cannot show the absolute truth of an issue, we as the audience must know how to determine what statistics are reasonably accurate interpretations of an issue, and what are merely biased interpretations on an issue. Federal statistics are relatively reliable due to its professionalism and responsibility to the country. However, in many cases in history such as the First World War, Canada and other countries produced incorrect statistics and censorship on the number of casualties of war for both Canada and the enemy to promote citizens at home to enter the army.

A good method to use when justifying whether or not a statistic can be acceptable, is to ask some basic critical questions about the statistics presented to us such as, “what is the message they are trying to send in their statistics” because creators often will go to extreme extents to find evidence to support their claims. Ask, “Does the author have degrees showing proof of Education” to help understand whether or not the creator is knowledgeable of what they are presenting. Check the date of the statistics published, or the date of the sources used to create the statistics to avoid obsolete information. Ask whether or not the statistics are reasonable, or do they sound too extreme to try and notice errors in generalizations. Checking the sources is often helpful as well. Realizing where the statistics are presented in; for example, a statistic presented on a personal homepage regarding federal issues will be less reliable than statistics found in actual federal reports. Ask if there are competing statistics to see both sides of the argument. Most importantly it is helpful to find out what was the method for retrieving these statistics so that we can see if the statistics contain any biased generalizations in language or calculations.

Statistics are used in many ways in our society to provide interpretations of the reality. Statistics often always contain biases and even errors that may distort the reality of an issue depending on the creator's motives. It is impossible for us as the society to ignore statistics simply because there is a possibility of receiving biased interpretations of an issue. All statistics contain mistakes because the primary objective of statistics is to present brief and simple interpretations of the truth. It is whether or not the statistics captures the heart of an issue of great complexity that determines its accuracy. It does not require great effort for the audience to quickly determine the accuracy of statistics presented with some critical questions; therefore we must approach statistics with criticism rather than with all our trust.