

Popular stereotypes frequently present the scientist and the artist as extreme opposites in their pursuit of understanding- the scientist as being objective, disciplined and rational, and artist as being subjective, impulsive and imaginative. Yet are they really so different in the ways they look at the world? To what extent do you consider these stereotypes accurate, and to what extent do you consider them distortions of the ways in which the sciences and the arts give us their knowledge?

Our world has been accelerated due to the advancement of both artists and scientists. For that, people have made stereotypes of these two professions in hopes of understanding them. These stereotypes are useful when it allows us to classify people that belong in each profession and have a general overview of them. However, it is catastrophic when it conjures wrong ideas about each expert as it would prevent people from really understanding who they are. Stereotypes occur as a result of attributing the supposed characteristic of a group to all of its individual members. Stereotyping assumes and emphasizes the uniformity within a group and exaggerates the differences between them. Scientists are stereotyped as being objective, disciplined and rational while artist are to be subjective, impulsive and imaginative. These stereotypes are ultimate opposites in their way of understanding. How accurate are the stereotypes? To what extent are the stereotypes distorted?

Webster dictionary defines science as "a body of truths that are discovered by the correct application of scientific methods." The scientific method is a "principle and empirical process of discovery and demonstration considered characteristic of or necessary for scientific investigation, generally involving the observation of phenomena, the formulation of a hypothesis concerning the phenomena, experimentation to demonstrate the truth or falseness of the hypothesis, and a conclusion that validates or modifies the hypothesis." The definition of science stated above has problems that need to be addressed as not all science are derived from generalized knowledge and only some sciences can genuinely test their results by the empirical method. Moreover, it can never be known whether science does or does not reach absolute truth. So at best, scientist, one who is an expert on sciences, can only hypothesize by putting theories forward that allow predictions that have a high probability of occurring. The predictions may be able to be tested but there is not certainty in it. To study any phenomena, scientists have to use their common sense as a basis of obtaining knowledge. Science then needs to eradicate subjective elements systematically so they are able to arrive at what is common to all the observations. It is inevitable that scientists are often stereotyped in being objective, disciplined and rational.

Scientists ways of knowing are most often through logic, especially by reasoning, as they often need to piece together data or link new data to past knowledge in order to interpret it. The discovery that our solar system is heliocentric, sun-centered, and not geocentric, earth-centered, is first made by Aristarchus of Samos in 310-230 B.C. He made this through deductive reasoning that since the sun is significantly larger than earth, it makes more sense for the earth to be rotating around the sun rather than the other way around. This hypothesis is however not widely accepted even when Nicholas Copernicus has published his book in 1543 where he made careful observation of the 'heavens' to make complicated calculations that would prove Aristarchus' hypothesis. Galileo Galilei is the first man to use a telescope to view the universe and became convinced that Copernicus' theory is in fact correct. Galileo saw the planet Jupiter through his telescope and saw that four moons orbit

¹ <http://dictionary.reference.com/search?q=scientific%20method>

it where they all lie in practically the same plane, close to the ecliptic, that is very much like a miniature version of Copernicus' solar system. Without objectivity and rationality of scientists, people may have not been able to learn the truth of how our solar system really is. The public can not deny the facts before them when scientists are able to prove that their theories correct. These qualities that often associate with scientists are the reason that they are so highly regarded in our world, as they are able to become detach from themselves and just looking at hard facts to make assumptions. Scientists are wedded to reason, to the meticulous working out of consequences from assumptions, to the careful organization of experiments designed to check the consequences. Therefore a popular belief is that a great scientific discovery is sprung from a series of logical steps, each taken coolly and calmly, in a rational order but this is not often the case.

Is there really such a thing as scientific objectivity? When scientists are not really being objective are when they are so certain of their theory that they try to make the obtained results fit to their theory. When this happens we can see that scientists are not trying to discover the laws of nature from the data as we think but instead the opposite. This is how Mendel's pea experiment conclusion came to be, from selective data. Also surprisingly, some of the greatest discoveries scientists made on earth are only made possible because logic went hay wired and reasons abandon. Radioactivity, one of the most monumental discoveries in history, has been discovered by Henri Becquerel through illogicality. He is led by a belief that certain rocks emit X-ray due to his interest in minerals that fluorescence after exposure to sunlight. His original experiment purpose, where he is trying to see whether minerals fluorescence after exposure to sunlight, has failed several times and because of his frustration, he built a photographic plate where he found the undiminished intensity of the rays in the dark. He then concludes that there could only be one explanation, because the rays that come from the uranium mineral are not only triggered by sunlight but also with another obvious external agent. It had nothing to do with fluorescence but due to the intrinsic to the uranium salt. Becquerel is not the only one that has been led to a major scientific break through by a faulty chain of logic, like the case of William Harvey who made the discovery of the circulation of blood. Harvey views the "human body as a microcosm of the universe" so he looks toward the heavens to get insights into the body. He uses Copernicus' theory that the planets circle the sun, the life-giving source of energy in the solar system, to parallel with the heart as the central organ. "The heart," he wrote, "is the Sun of the microcosm." These are just some examples where scientists are led to discoveries through irrationality.

Irrationalities are most associated with the characteristics of artists. Artists are "One(s) who professes and practices an art in which conception and execution are governed by imagination and taste²." They are able to make "conscious production or arrangement of sounds, colors, forms, movements, or other elements in a manner that affects the sense of beauty, specifically the production of the beautiful in a graphic or plastic medium.³" This definition of art is ambiguous as art may not be produced consciously and is not always about beauty production.

Artists are stuck with notion that they pursuit knowledge by being subjective, impulsive and imaginative. Whilst scientists are perceived to be concerned about the external world, artists has been typecast as being not concerned about external reality but only with the inner realm that holds one's soul. To be able to express their soul, artists needs to be imaginative and subjective. People think of them as impulsive as they can only do pieces of

² Webster World Dictionary

³ Webster Dictionary - <http://dictionary.reference.com/search?q=art>

works when they are hit with the passion to create art. Yet are these the only times when artist creates art?

Michelangelo sculpted the statue of David with great precision and detail that can only be done by a disciplined person. In order to create such a masterpiece, he had to be rational and careful when carving it whilst also putting expressing his soul in it. He had to make diagrams of the statue in order to be able to guide himself through the basics, but still use creativity and imagination to liven the statue.

Erwin Josephus Raisz (1893 - 1968) claims that "The good cartographer is both a scientist and an artist." If an artist and scientist are complete opposites in their way of knowing, then how could one be both these two professions? A cartographer needs to be able to map areas by using their imagination while it still needs to be accurate. Also if one is to think of Leonardo da Vinci, the question about the ability of scientists to be artists, and vice versa, is a totally possibility. Leonardo da Vinci is the creator of the masterpieces Mona Lisa and The Last Supper, both extremely valuable art works. But he is also much more than just a great artist, he also has one of the best scientific minds of his time. He made conscientious observations and carries out research from fields that range from astronomy to zoology. That's why Leonardo da Vinci would often be classified as both a great artist and scientist.

Scientists need to be creative, and sometimes impulsive for them to make discoveries. If scientists just takes a backseat after each discovery or theory is made, we might not know for certain if it is in fact the truth. Using the same example of the heliocentric and geocentric solar system model, we might still have not discovered that we are in reality rotating around the sun and not the other way around if it was not for scientists rethinking the solar system model theory. A great scientist relies on intuition and imagination which allows them to make hypothesis and connect one idea to another.

By assessing the arguments above, one of the ways for humans to obtain new knowledge is by being able to look at the world in as many different ways as possible. Both artists and scientists should have the characteristics of both experts to be the best at what they are. Although the most prevailing stereotypes of an artist and scientist are polar opposites, we learn that they might not be so different at all in their search of understanding. Stereotypes makes it easier for humans to classify objects, but humans must be able to look past stereotypes for them to see the true aspects of "supposable" two very different professions, as they might not be so different at all.

Bibliography:

Michelangelo - <http://encarta.msn.com/encnet/refpages/RefArticle.aspx?refid=761560125>

Leonardo da Vinci - <http://www.ucmp.berkeley.edu/history/vinci.html>

logic - <http://awards.faithweb.com/logic.html>

- Logic handout

<http://www.physics.weber.edu/carroll/honors/scivart.htm>