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Science, Mathematics



How can we recognize when we have made progress in the search for knowledge? Consider two contrasting areas of knowledge. The search for knowledge is a constantly ongoing process. So how are we to know if we have made any progress? Progress is development, advancement, and moving forward. In this case it is the progress in the search for knowledge in an area of knowing. Within the areas of knowing the strongest contradiction is between human science and natural science. Human sciences are also known as the social sciences which include anthropology and psychology. Natural sciences on the other hand include sciences such as biology and pharmacology. As we are in the quest of knowledge in these two divergent areas of knowledge, the type of knowledge we are searching for is important to determine. If one is to make progress in a subject that represents what he or she has learned then it has helped them to move forward. Progress can be defined through positive and negative experiences as long as growth is achieved. Progress in human science is usually a long process. Take, for example, the human science of psychology. In psychology there are numerous disorders that require therapy to help alleviate the severity of said disorder and to help the patient afflicted cope with the symptoms and difficulties therein. For instance, a phobia is an intense and irrational fear of a stimulus. In order for someone to deal with the pain and suffering of their phobia, they would need to undergo sessions of therapy to overcome their fear. The duration of therapy would be dependent on the intensity of the phobia. This is where the "long process" comes into play. To achieve any progress a form of therapy called systematic desensitization is commonly used to break a phobia. Systematic

desensitization is a behavioral therapy process where the person suffering from the phobia or anxiety disorder is first taught relaxation skills and ways to cope with their fears and then is gradually exposed to their fear.[1] To see how this is effective, imagine the example of arachnophobia, or fear of spiders. First a trained behavioral psychologist would teach the arachnophobe how to relax themselves in times of stress or anxiety. Then over a set course, the person would gradually be exposed to spiders. At the beginning it may just be other insects, then maybe a picture of a spider, then possibly have a small spider in the same room as them but in a container, next a larger spider, until eventually and if the therapy worked properly, the arachnophobe would be able to be comfortable with a tarantula crawling across their hand. This is obviously a long and drawn out treatment but every minuscule step towards reaching the final goal is progress. Progress in relation to psychology and human sciences isn't normally the rapid results but a cascade of impact. There can be many highs and lows during the journey towards success and knowledge. The knowledge that is gained during the progress made in human sciences is vital to future experiments, cases, and generations. In any form of therapy, there is much fine-tuning to be done to finally achieve that final result. Once this is complete, though, the possibilities are endless. In the search for knowledge in the human sciences, it is a necessity that a wide scope of results is collected because everyone is different. One situation for person A could be the polar opposite for person B. This is when knowing whether progress has legitimately been made or not becomes visible. Since humans are extremely complex beings, it is difficult to decipher through what is positive and helpful and what is the extraneous

data. In order to further understand this think of the example of media violence. Media violence has been the topic of much discussion in recent history. Research has been conducted to try and correlate violence in movies, video games, and music to violence and aggression in human behavior. To actually produce progress, large longitudinal studies would need to be conducted. In this study, different environments, socio-economic classes, and temperaments would need to be considered. To conduct such a complex experiment would seem to produce progress at a far slower rate than it takes to collect the data. This is the time in which it is hard to gauge whether progress is actually being made. But as stated previously, any small part of positive achievement is progress in human sciences. Even information that is collected that does not benefit the overall goal is partial progress. A contrasting area of knowledge to human sciences is natural science. The authority on natural phenomena is a scientific study. This is the case because science provides demonstrable facts. " Science is reliable, precise, objective, testable, and self-correcting. "[2] To gain knowledge in the area of natural science it is essential that the scientific method is used. For any experiment, the scientific method must be applied. It consists of six basic steps consisting of: state what is to be investigated, observation, forming a hypothesis, testing the hypothesis, analyzing results, and proposing a conclusion. To view how the scientific method works take into account the one of a IB Biology experiment I conducted on the growth of kidney beans. I wanted to research the growth of kidney beans when watered with ammonia. I setup the experiment, observed the plants, and collected data over a course of fifteen days. I then formed a hypothesis that the ammonia

had a negative effect of the kidney bean's growth. I analyzed the data I had collected, and with that formed my theory that indeed ammonia negatively affects the way in which kidney beans grow. A simple real life example can use the scientific method just as easily as a scientist using it to test the formula for a medication to treat arthritis. In contrast with progress in human sciences, natural science is progress towards knowledge is commonly gained through trial and error. Trial and error is a testing type in which multiple trials are established to be tested and the errors are dismissed while the successes are recorded and further tested. In natural science one of the more recent and studies was the Human Genome Project. This project's goals were as follows: " identify all the approximately twenty thousand to twenty-five thousand genes in human DNA, determine the sequences of the three billion chemical base pairs that make up human DNA, store this information in databases, improve tools for data analysis, transfer related technologies to the private sector, and address the ethical, legal, and social issues that may arise from the project. " [3] The Human Genome Project was started to progress understanding in many fields of science. With the knowledge obtained, the applications of different genetic therapies are endless. On the other hand, it's obvious that the process the team of scientists underwent to complete this task consisted of an unlimited number of trial and error runs. Through these trials, progress was made and eventually success was reached. Although the Human Genome Project has officially concluded, tests are still being done. In natural sciences, the knowledge a researcher was seeking may have been reached, but there is always new technology being invented to better their knowledge and expand

their understanding. This advancement in technology is progress in itself. In conclusion, progress is constantly happening all around us. It is up to us to recognize it and use it to further our knowledge in the area in which the progress is being made. Once it is interpreted it can be used in endless ways. In the areas of human science and natural science, the ways in which progress is achieved may vary but, the fact that progress is being made is key. In the words of Oliver Wendell Holmes, " The great thing in the world is not so much where we stand, as in what direction we are moving. " Work Cited 1 Ludorf, Mark R., James W. Kalat, and Eric Bohman. " Anxiety and Avoidance Disorders." Introduction to Psychology. 7th ed. Belmont, CA: Thompson Wadsworth, 2005. 261. 2 Woolman, Michael. Ways of Knowing: an Introduction to Theory of Knowledge. Melton, Vic.: IBID, 2006. 107. 3 " Human Genome Project Information." Oak Ridge National Laboratory. 3 Feb. 2011. Web. 01 Mar. 2011. http://www.ornl.gov/sci/techresources/Human_Genome/home.shtml ----- [1] Introduction to Psychology by James W. Kalat pg. 621 [2] Ways of Knowing: An Introduction to Theory of Knowledge by Michael Woolman pg. 107 [3] Human Genome Project Information http://www.ornl.gov/sci/techresources/Human_Genome/home.shtml