The Nature of Science and Math: Analyzing the Presence in Everyday Communication

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The article *Scientists Move Closer to Understanding Schizophrenia's Cause* (Carey, 2016) represented the nature of science accurately in that it met the following tenets of the nature of science: Science Addresses Questions about the Natural and Material World, Scientific Investigations Use a Variety of Methods, and Science is a Way of Knowing (NGSS Release, 2013). The article by Carey focused on a study published in the journal Nature about the cause of Schizophrenia. The tenet 'Science Addresses Questions about the Natural and Material World' has a learning outcome "Scientific knowledge is constrained by human capacity, technology, and materials" (NGSS Release, 2013). In the article, a psychiatry professor at the University of California, San Francisco, Dr. Samuel Barondes, talks about the study being one step in a journey that will continue (Carey, 2016). As our understanding of genetics and the role of the C4 protein evolves, the scientific knowledge about the cause of Schizophrenia will also evolve. The NYT article also mentions that the use of advanced statistical methods allowed the research team to determine that a specific gene locus thought to be associated with Schizophrenia had four variants which produced two kinds of proteins (Carey, 2016). As a new method of statistical analysis was used, scientific knowledge was expanded.

Scientists Move Closer to Understanding Schizophrenia's Cause also represents the nature of science tenant 'Scientific Investigations Use a Variety of Methods' accurately. In the article, it is mentioned that the researchers used multiple methods of investigation including genetic profiles, statistical analysis, and lab work with mice genomes (Carey, 2016). Each method would use a different procedure to obtain data (NGSS Release, 2013), showing that there is not just one way to do science.

Finally, the nature of science tenant 'Science is a Way of Knowing' was addressed in the NYT article. Carey wrote "the results provide researchers with their first biological handle on an

ancient disorder whose cause has confounded modern science for generations" (Carey, 2016), addressing the idea that "Science knowledge has a history that includes the refinement of, and changes to, theories, ideas, and beliefs over time" (NGSS Release, 2013). Several scientists are also quoted in the article saying that the study is a step forward in science knowledge that will be expanded upon.

Three common core mathematics practices were also addressed in the article *Scientists Move Closer to Understanding Schizophrenia's Cause*. The researchers used advanced statistics to "apply mathematics they know to solve problems" and "Model with Mathematics" (Common Core Math, 2019). The statistical analysis allowed the researchers to find variants of a gene associated with Schizophrenia. In addition, the researchers "analyzed the genomes of more than 64,000 people and found that people with schizophrenia were more likely to have the overactive forms of C4-A than control subjects" (Carey, 2016). The analysis would have been a mathematical analysis based on statistics/probability.

The NYT article also addresses the common core mathematics practice "Make sense of problems and persevere in solving them". The article talks about how the researchers looked at the MHC area of the genome because it was thought to contain genes related to the body's immune response, which may be a factor in causing Schizophrenia – they were trying to make sense of what physiological process could cause the disease. The researchers persevered through their use of multiple methods to find their conclusion.

The common core mathematics practice "Use appropriate tools strategically" was addressed in the article as it was mentioned that the research team used statistics, the Manhattan plot, and the analysis of genomes as part of their study (Carey, 2016).

References

Carey, B. (January 28, 2016) Scientists Move Closer to Understanding Schizophrenia's Cause. *The New York Times*, pp. A4. Retrieved from http://nyti.ms/1SbqRGE

(2013, April), NGSS Release. Retrieved from https://www.nextgenscience.org/sites/default/files/resource/files/Appendix%20H%20-%20The%20Nature%20of%20Science%20in%20the%20Next%20Generation%20Science%20Standards%204.15.13.pdf

(2014, August 20). Myths of the nature of science. Retrieved from https://www.sciencelearn.org.nz/resources/415-myths-of-the-nature-of-science