

“Humans are pattern-seeking animals and we are adept at finding patterns whether they exist or not” (adapted from Michael Shermer). Discuss knowledge questions raised by this idea in two areas of knowledge.

Shermer's statement implies that we are skilled at both discovering genuine patterns, but also extrapolating patterns where they do not exist, implying only the former constitute legitimate knowledge. This creation of such patterns, known as Apophenia¹, arguably arises from a skill honed by evolution to find meaningful patterns in apparently random, but actually connected data. I will suggest that it can actually render the knowledge produced less accurate, particularly within the human sciences. Nevertheless, patterns, when legitimately recognised, undoubtedly consolidate certain facts and enable humans to make more substantiated knowledge claims, particularly in mathematics, as they bring together disparate theories and facts.

The first knowledge question is that if Shermer is right that we are pattern-seeking animals, why have we developed in this way? Many influential scientists such as Hinterthuer² make the knowledge claim that we have a natural predisposition to believe a pattern whether it is real or not, highlighting that it is less dangerous to believe in a pattern when it is not real, as opposed to failing to recognise a pattern when there is one³. For instance, when we hear rustling in the trees, it is safer to assume danger and believe a false pattern, as opposed to being killed by a predator⁴, supporting the fact that pattern-seeking is derived from the way of knowing, intuition. This evolutionary tendency towards patterns is also supported by experiments in the human sciences which suggest that we do have a natural inclination. For instance, in the University of Texas, human scientists conducted six experiments related to perception of patterns in the stock market, and also wider investigations into optical illusions⁵. Repeatedly, and indeed seemingly intuitively, students found images and stock

¹ Carroll, R. (2016). *Apophenia and Pareidolia*. [online] 59ways.blogspot.co.uk. Available at: http://59ways.blogspot.co.uk/2012/01/apophenia-and-pareidolia_09.html [Accessed 17 Dec. 2016].

² American, S. (n.d.). *Brain Seeks Patterns Where None Exist*. [online] Scientific American. Available at: <https://www.scientificamerican.com/podcast/episode/brain-seeks-patterns-where-none-exi-08-10-03/> [Accessed 20 Dec. 2016].

³ Shermer, M. (n.d.). *The pattern behind self-deception*. [online] Ted.com. Available at: https://www.ted.com/talks/michael_shermer_the_pattern_behind_self_deception [Accessed 25 Dec. 2016].

⁴ *ibid*

⁵ Today.mcombs.utexas.edu. (n.d.). *Whitson in Science: Loss of Control Behind Superstitions, Rituals, Conspiracy Theories* | McCombs TODAY. [online] Available at: <http://www.today.mcombs.utexas.edu/2008/10/whitson-in-science-loss-of-control-behind-superstitions-rituals-conspiracy-theories> [Accessed 29 Dec. 2016].

market 'patterns', where legitimate patterns did not exist. This also raises the point that a tendency that is helpful in an "animal" state may be unhelpful when it persists into complex human society.

Nevertheless, a significant counter-claim to this theory that we have a biological inclination to seek patterns is that we cannot attribute these results from the University of Texas to evolution. There could be other reasons such as personal experience, social conditioning or the organisation of the experiment which could have elicited this result. For example, if the participants in this experiment knew that they were partaking in a human-sciences experiment, they may be susceptible to the observer effect, therefore not behaving naturally when being observed⁶. Therefore, we cannot definitively prove that our awareness of patterns is a result of our evolutionary makeup and intuition, as Shermer implied by calling us 'animals'.

The second knowledge question is, do we always create these patterns, as opposed to discovering them? On the one hand, many argue that patterns, underpinning such a large proportion of mathematics, are intrinsic to nature. For instance, the Fibonacci Sequence leading to the Golden Spiral, and many logarithmic spirals, like Nautilus shells⁷, appear in nature. This suggests that in acquiring knowledge about patterns, we are merely discovering what already exists, as opposed to devising them ourselves. This is further supported by examples in the human sciences. For instance, in my study of Economics IB, we examined the pattern of the business cycle. Given that there is quantitative evidence to suggest that this is a genuine pattern, it seems that it is a discovery as opposed to a creation.

Nevertheless, although it seems that patterns are discovered as opposed to created if genuine, this does not explain how we devise false patterns. Firstly, there are instances where we create patterns out of data where there is no correlation or a weak one at best, using the way of knowing of imagination. For example, the qualitative and quantitative relationship between wealth and happiness⁸. This suggests that we as humans, create these patterns where there is a distinct lack of evidence. This leads to false knowledge claims and

⁶ Kim, O. (2007). *What is the Observer Effect?* | TOKTalk.net. [online] Toktalk.net. Available at: <http://www.toktalk.net/2007/12/24/what-is-the-observer-effect/> [Accessed 4 Jan. 2017].

⁷ Math.temple.edu. (n.d.). *THE FIBONACCI SEQUENCE, SPIRALS AND THE GOLDEN MEAN*. [online] Available at: <https://math.temple.edu/~reich/Fib/fibo.html> [Accessed 27 Dec. 2016].

⁸ Psychology Today. (n.d.). *Does Money Really Buy Happiness?* [online] Available at: <https://www.psychologytoday.com/blog/how-happiness/201409/does-money-really-buy-happiness> [Accessed 23 Dec. 2016].

assertions being made in Psychology. Furthermore, even if there is a correlation, psychologists can often misconstrue causation from this. For instance, bereavement is often strongly correlated with bouts of depression, yet there is not a direct causation⁹, again leading to real-world conundrums in the treatment of such conditions.

It is important to address the knowledge question in what ways do patterns consolidate and strengthen, or weaken knowledge acquisition? On the one hand, given that in human sciences we are presented with a complex and interdependent system, knowledge in the form of a pattern is more applicable as it allows us to make sense of the world. For instance, in psychology, the model of addictive behaviour¹⁰, highlighting both the causes and treatments for sufferers, allows psychologists to predict, with a high degree of accuracy, that certain therapy will work with certain sufferers. This suggests that patterns give knowledge more application in the real world. Furthermore, in mathematics, general formulae such as the quadratic formula, derived from patterns, allow humans to apply certain knowledge theories to real life problems. For instance, in Maths Studies IB we are given word problems which we have to make sense of often using these general formulae derived from patterns. Furthermore, patterns can also help us generate knowledge in itself. The scientific method, used by psychologists and scientists to conduct their research, is a pattern, as it is a standardized way of making observations, gathering data, testing predictions, and interpreting results¹¹. This makes knowledge generation more reliable, as it ensures that experiments are conducted in a way that conforms to an objective standard of legitimacy.

Nevertheless, a significant counter-claim to this is that in finding patterns that do not exist, we create unwarranted casual associations between events or facts. This clearly poses a threat to the reliability of knowledge, as it disregards subtle detail and nuances in favour of a general pattern. For instance, in the Human Sciences, confirmation bias, which is the tendency to interpret new evidence as confirmation of one's existing beliefs or theories,

⁹ Paula L. Hensley, M. and Paula J. Clayton, M. (n.d.). *Bereavement-Related Depression* | *Psychiatric Times*. [online] Psychiatrictimes.com. Available at: <http://www.psychiatrictimes.com/articles/bereavement-related-depression> [Accessed 29 Dec. 2016].

¹⁰ Hoddereducation.co.uk. (n.d.). [online] Available at: <https://www.hoddereducation.co.uk/getattachment/7aa9a1c8-27db-44d3-8327-506e69984899/e09323f9-3ae3-49dd-83d1-e1cfa597d829.pdf.aspx> [Accessed 22 Dec. 2016].

¹¹ Sparknotes.com. (n.d.). Spark Notes: Research Methods in Psychology: *The Scientific Method*. [online] Available at: <http://www.sparknotes.com/psychology/psych101/researchmethods/section2.rhtml> [Accessed 4 Jan. 2017].

renders the knowledge produced far less accurate, as often the human scientist has a pre-formulated pattern that s/he wants their data to conform to. This is highlighted by the 'Skin Cream and Gun Control'¹² experiment in the human sciences, where Dan Kahn presented two similar groups of people with the same set of complicated random data with a correlation, in one instance posing the question 'Did this skin-care product lead to better skin?' and in the second case 'Did gun control lead to less crime?'. In experiment one, those more numerically proficient found the pattern yet in experiment two, Republicans, did everything they could to resist conclusion that, on the basis of this data, gun control led to less crime.

Patterns in the human sciences, particularly economics, can also only work in certain contexts. For example, the pattern which dictates that an increase in GDP leads to a decrease in unemployment only works '*ceteris paribus*', which means all factors remaining constant. This has little application in the real world, as all other factors are never constant thereby rendering the knowledge claim less applicable. This also highlights the problem that behaviour in the human sciences is too complex and erratic to be attributed to a pattern, and to simplify it in such a way disregards the complicated nature of humans, as sentient, conscious beings as opposed to just 'animals'. This is exemplified by the new phenomenon in analytics in the human sciences known as 'big data' which is the process of examining large data sets to uncover hidden patterns and correlations¹³. A problem with this, highlighted by Daniel Kahneman in his book 'Thinking Fast and Slow'¹⁴, is the fact that surely in using such expansive sets of data to find even minimal patterns, we are assuming that we can decipher human behaviour from numerical values. Furthermore, in the Sally Clark case where there was a miscarriage of justice because an expert was convinced, and convinced the jury, that two cot deaths in the same family had to be a pattern. This case gives a concrete example of harm that can flow from seeing false patterns. Therefore, although this skill may allow us to make sense of facts, over-emphasising correlation can lead to monumental issues shown above.

I have addressed three main knowledge questions; why we are so inclined to perceive patterns, whether we discover patterns or create them, along with the validity of such

¹² Radio 4, (2017). *Nothing but the truth*. [podcast] The New World. Available at: <http://www.bbc.co.uk/programmes/p04m7zrs> [Accessed 11 Jan. 2017].

¹³ Rouse, M. (n.d.). *What is big data analytics?* - Definition from WhatIs.com. [online] SearchBusinessAnalytics. Available at: <http://searchbusinessanalytics.techtarget.com/definition/big-data-analytics> [Accessed 11 Jan. 2017].

¹⁴ Kahneman, D. (2011). *Thinking, fast and slow*. New York: Farrar, Straus and Giroux.

knowledge claims. In exploring each question, it has become apparent that pattern seeking desires are not solely confined to the human sciences and mathematics. Rather it transcends into all areas of knowledge. For instance, the phenomenon of Pareidolia is very relevant to the area of knowledge of The Arts, and the evolutionary predisposition and the correlation causation fallacy is very relevant to the Natural Sciences. Furthermore, many historical commentators have suggested that 2016 follows the same dangerous patterns as nationalism in the 1930s, it seems that patterns within knowledge claims also extend to history, which arguably would not exist as an area of knowledge, unless we believed that patterns can emerge and be rectified. Therefore, it can be concluded that patterns are of vital importance to knowledge claims, yet they should be created and identified with caution.

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