

Providence and Probability¹

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Abstract

Divine providence is an important topic in Christian theology and piety. However, there is much misunderstanding. Many people, partly because of the nature of normal cognitive processing, view creation and God's interaction with it using a simple "cause and effect" model; this often leads to confusion and inconsistency. The reality is that almost all processes in the world involve multiple interacting factors, including random ones. Consequently, creation is best understood using the mathematical tool of probability. Furthermore, many biblical texts suggest that randomness and complexity are part of God's good creation. In this paper I review probability theory and mathematical randomness, then discuss common errors in human judgment. I consider randomness and probability in Christian theology and discuss varying views of providence. Divine providence and probability theory are considered compatible. I propose that probability theory is a helpful tool for Christianity; if understood and employed with humility, wisdom, and discernment, it can improve our judgments and inform our pastoral care.

Canada recently had an election. The outcome was determined by a majority of individuals voting for a party leader. Political forecasters used statistical analysis, including probability theory, to predict the result. Many Christians voted and prayed for divine guidance, using the electoral system while simultaneously stating that the outcome is "in God's hands." Of course, after the fact, many claimed that God's will was done. Much of daily life, because it involves multiple unpredictable factors, is best described in terms of probability rather than certainty. This includes both the natural and the social world; all of God's creation. Weather forecasters tell us there is a 60% chance of rain, surgeons tell us there is a 99% chance

¹ This article is related to E. Janet Warren's recently published book *All Things Wise and Wonderful: A Christian Understanding of How and Why Things Happen, in Light of COVID-19* (Eugene, OR: Wipf and Stock, 2021). She would like to thank the editors and reviews of *CATR*, as well as Christian Barrigar for his feedback on a draft of this article.

our surgery will succeed, and farmers scatter seeds in random patterns knowing that only some will sprout. We play games using probabilities, such as dice and coin flips. Even biblical characters “cast lots.”

Yet, often Christians discuss God’s will and action in their lives in terms of certainty, denying any possibility of coincidence or randomness. People confidently claim: “It’s up to God if my crops succeed,” “God answered my prayer for sunshine at my party,” “God blessed me with a baby.” We make retrospective judgments, broad generalizations, and focus on positive outcomes. We fail to distinguish between the mundane (“God told me what socks to wear today”) and the miraculous (“God healed my cancer”). Even those who speak less confidently are often inconsistent, appealing to the mystery of providence. I suggest that a better understanding of the complex and probabilistic nature of the world can inform our understanding of divine providence, our discernment of divine action, and can foster spiritual growth.

Of course, mathematics and theology have different languages, methods, aims, and categories of knowledge. Nevertheless, the world reflects its Creator, if imperfectly, and we are called to understand it and image God as best we can. Scientist-theologian John Polkinghorne famously claims that “epistemology models ontology”; what we know of the world approximates what it actually is.² Statistics can therefore be viewed as a tool for acquiring knowledge about the created order. In this article, I first review the science of probability and randomness, and human difficulties in judging event causation. Then I review probability and randomness in the Bible, and theological concepts and models of providence. Finally, I propose some pastoral applications from this research.

Probability and Randomness in the World, and Human Perception of it

Creation, although often delightful, is complex. Much of the natural and social world involves dynamic processes characterized by multiple interacting factors, self-organization, self-perpetuation, and emergence of new processes that are irreducible to their substrates.³ Causation is dispositional, often redundant, and

2 E.g., Polkinghorne, *Exploring Reality* (New Haven: Yale University Press, 2005): 34.

3 Much of this has been discussed within the framework of chaos-complexity theory. Reductionism, characteristic of classic science, is no longer considered valid, and much remains unknown in all aspects of science. E.g., Ian Stewart, *Does God Play Dice? The New Mathematics of Chaos*. 2nd ed. (New York, London: Penguin, 1997); John Polkinghorne *Quarks, Chaos and Christianity*, 2nd ed. (New York: Crossroad, 2005); Leonard Smith, *Chaos: A Very Short Introduction* (Oxford: Oxford University Press, 2007); R.J. Russell, *Cosmology: From Alpha to Omega*. (Minneapolis: Fortress, 2008); Len Fisher, *The Perfect Swarm: The Science of Complexity in Everyday Life* (New York: Basic, 2009); Peter M. Hoffman, *Life’s Ratchet: How Molecular Machines Extract Order from Chaos* (New York: Basic, 2012); Nancy Cartwright and Keith Ward, eds., *Re-thinking Order after the Laws of Nature* (New York: Bloomsbury Academic, 2016).

includes bottom-up as well as top-down processes. Many systems involve random processes, providing flexibility and multiple potentialities that enrich the world. There are many levels of reality that are self-sustaining, and do not require meticulous divine oversight. Processes and events in our complex world are best understood through statistical theory, but human cognitive processes are not well equipped to easily understand this science. We examine these two factors in turn.

Statistics, Probability, and Randomness

Like it or not, we are surrounded by numbers in our daily lives: costs, rates, sizes, frequencies, and risks. Statistics, a branch of mathematics, is the practice of collecting and analyzing numerical data in large quantities.⁴ It can be descriptive (mere observations) or inferential—drawing conclusions about a large group from a smaller but representative sample of that group. Observations can be used to make predictions or develop theories to explain data. Statistics is sometimes known as a theory of ignorance because it is used when we lack knowledge, especially about causation. It quantifies some aspects of reality and attempts to measure uncertainty.

One important aspect of statistical analysis is sample size. The so-called law of large numbers states that as the number of trials (or randomly generated instances) increases, its average outcome approaches the theoretical mean or expected value. In other words, the more information collected, the more accurate our knowledge. A coin toss may show heads five times in a row, but after 100 or more tosses, heads and tails will be equal. Of course, exceptions and outliers are also important, but we need to be very careful in making conclusions from exceptional cases.⁵ Furthermore, the larger the sample size, the higher the probability of strange things happening.⁶

Another important concept is rate: a measurement of one value for a variable in relation to another, usually larger, measured quantity. For example, the birth rate in Canada in 2018 was 10.1 live births per 1000 population.⁷ The base rate, or

4 Statistical concepts have been around since about 500 BCE, but their contemporary form is often attributed to John Graunt, whose 1662 study of mortality patterns in London led to life tables. E.g., StatSoft, Inc. *Electronic Statistics Textbook* (Tulsa, OK: StatSoft, 2013), <http://www.statsoft.com/textbook/>; Barbara Illowsky and Susan Dean, *Introductory Statistics* (Houston, TX: OpenStax, 2013), <https://openstax.org/books/introductory-statistics>; Stephanie Deviant, *The Practically Cheating Statistics Handbook: The Sequel* (ebook, 2019), <https://agomedia.press/med-16066/B007OWPFDE>, <https://www.statisticshowto.datasciencecentral.com/>

5 Points made by Nicholas Nassim Taleb, *The Black Swan: The Impact of the Highly Improbable*. 2nd ed. (New York: Random House, 2010).

6 As mathematicians Diaconis and Mosteller conclude, “There are 7.6 Billion people on Planet Earth. Strange things are bound to happen once in a while.” P. Diaconis and F. Mosteller, “Methods of Studying Coincidences,” *Journal of the American Statistical Association* 84 (1989): 853–61.

7 Statistics Canada, “Crude Birth Rate.” Table 13-10-0418-01; <https://doi.org/10.25318/1310041801-eng>

prior probability, describes the usual occurrence of an event, and is sometimes described in terms of “odds.” This is important because one cannot evaluate causation without knowing the probability of something happening before a change occurred.

This leads us to mathematical probability, which applies to events that have uncertainty (actually most of life!), and is measured by the ratio of favorable cases to the total number of cases.⁸ This is usually expressed as a number between 0 and 1, a percentage, or an odds ratio. Probabilities are a way of expressing ignorance, taming unpredictability, or quantifying uncertainty. They allow us to make decisions about individual occurrences based on knowledge of large numbers, or group behavior. For example, automobile manufacturers know the typical life span of an engine and offer guarantees based on this information. Probabilities only give information about groups, not individuals; for example, we can know human life expectancy in a particular location and time period, but we cannot know the life expectancy of a particular individual (this is a good thing). Epidemiologists commonly use 2x2 tables to help understand and predict disease causation, or evaluate the effectiveness of tests.⁹ Probabilities are often surprising, as in the “birthday problem”: If there are 41 people in a room, there is a 90% probability that two of them will share a birthday (date and month, not year). This is easier to understand if one considers that there are actually 820 pairs of people in the room.

Another important issue is whether probabilities are independent or dependent. In a coin toss, the outcome of each event is independent of previous ones. In this case, probabilities can be multiplied; e.g., the chance that a coin lands “tails” is 50%; and that it lands “tails” twice in a row is 25% (0.5×0.5). Note that the probability is still 50% for each subsequent toss (this often leads to confusion, for example, when a woman has three sons in a row—the probability of her fourth child being a boy is still 50%). However, in many events involving interacting factors, the calculation is more complex. Agent intervention changes probabilities, and calculations change and improve as we acquire more knowledge. What we do on one occasion may depend on what we did on a previous one. We assume

8 E.g., Ian Hacking, *The Taming of Chance* (Cambridge: Cambridge University Press, 1990); J. S. Rosenthal, *Struck by Lightning: The Curious World of Probabilities* (Toronto: Harper Perennial, 2005); Peter Coles, *From Cosmos to Chaos: The Science of Unpredictability* (Oxford: Oxford University Press, 2006).

9 E.g., A.G. Dean, K. M. Sullivan, and M. M. Soe, *OpenEpi: Open Source Epidemiologic Statistics for Public Health*, www.OpenEpi.com, updated 2013/04/06; Phyllis McKay Illari, Federica Russo, and Jon Williamson, “Why look at Causality in the Sciences? A manifesto,” in Illari, Russo, and Williamson (eds.) *Causality in the Sciences* (Oxford: Oxford University Press, 2011): 3–22; Peter Rabins, *The Why of Things: Causality in Science, Medicine, and Life* (New York: Columbia University Press, 2013); Sara E. Gorman and Jack M. Gorman, *Denying to the Grave: Why We Ignore the Facts That Will Save Us* (Oxford: Oxford University Press, 2017).

people learn from mistakes and change their behavior. Our probability calculations will change and improve as we acquire more knowledge.¹⁰

Although we place more weight on occurrences with higher probabilities, we should not always reject those with low probabilities.¹¹ Rare events can be meaningful; for example, credit card companies will notice unusual spending and alert owners to possible fraud. These can sometimes clump together—shark attacks, or receiving three party invitations one weekend, and none the next.¹² But we should take care in overinterpreting these. They are not all that surprising, given the law of large numbers. Coincidences are similar to low-probability events, but the term is used more when new meaning is ascribed to the occurrence and/or cause cannot be determined. Accidents can be considered an unhappy form of coincidence.

If probability is difficult to understand, its relative, randomness, is even more so. It describes occurrences that lack a pattern of organization or a discernible cause and are thus unpredictable. Although “chance” and “randomness” are often used interchangeably, the term randomness is more precise. Ontological (intrinsic) randomness, sometimes called “pure chance,” claims that randomness is inherent in some aspects of reality. This occurs at the quantum level, the prototypical example being radioactive decay. The position and velocity of subatomic particles cannot be known simultaneously; they spin in a superimposed state with a 50% chance of being either “up” or “down.”¹³ Such particles nonetheless yield stability at visible levels. Epistemological (apparent) randomness states that randomness is only perceptual, a result of our lack of knowledge, much of which is unobtainable. Classic examples include the roll of a die, the weather, and most biological processes, such as illnesses, all of which are dependent on so many causal factors interacting over space and time that detection is impossible, and effects are uncertain.¹⁴ In fact, the distinction between actual and perceived randomness is more theoretical than practical, and pseudorandom number generators

10 This known as Bayesian probability—a combination of conditional and total probabilities allows us to revise our decisions according to the information we have. It thus incorporates prior beliefs and reasonable expectations.

11 Taleb, *The Black Swan*.

12 This is known as Poisson clumping.

13 Known as the Heisenberg uncertainty principle; e.g., Coles, *From Cosmos to Chaos*, 121–35; John Polkinghorne, *Quantum Theory: A Very Short Introduction* (Oxford: Oxford University Press, 2003).

14 The Augustinian monk Gregor Mendel was one of the first to note random transmission of genetic information.

Wilton H. Bunch describes randomness as the “confluence of deterministic causal streams that lead to an unpredictable outcome”; Bunch, “Theodicy through a Lens of Science,” *Perspectives on Science and Christian Faith*, 67, no. 3 (2015): 189–99; Antony Eagle, “Randomness is Unpredictability,” *British Journal for the Philosophy of Science* 56, no. 4 (2005), 749–90; see also N. N. Taleb, *Fooled by Randomness: The Hidden Role of Chance in Life and in the Markets* (New York: Random House, 2005); James Bradley, “Randomness and God’s Nature,” *Perspectives on Science and Christian Faith* 64, no. 2 (2012): 75–89; Joseph Mazur, *Fluke: The Math and Myth of Coincidence* (New York: Basic, 2016).

yield the same effects as truly random process. As before, outcomes are best described in terms of probability.

As with probabilities and large numbers, random events at small or individual levels can nevertheless yield patterns and predictability in aggregate or groups. The adult population in North America will get four to six colds per year (base rate), but how many times an individual gets sick is random and unpredictable. Sometimes order develops out of chaos (indeterministic, probabilistic, unpredictable processes), and sometimes chaos develops from orderly (deterministic, predictable) processes. Theologian Thomas Oord summarizes the world well: “from quantum events to genetic mutations to human interactions and beyond, existence bubbles with randomness.”¹⁵

Random processes are useful in many areas of life. Most games rely on chance to ensure fairness, reduce bias, and allow less experienced players to win. An element of uncertainty can add surprise, excitement, and enjoyment to games. People sometimes seek out randomness and the risk it entails. They climb mountains, walk tightropes, and play slot machines. We all benefit from some degree of risk and uncertainty in our lives to allow flexibility, alleviate boredom, and challenge personal growth. Randomness is also used in many scientific methods, as with sampling. In a simple random selection, each possible sample has an equal chance of selection, which eliminates bias and allows fair representation. Extrapolation of conclusions to large populations from this method is likely the most important use of chance. In agriculture, cheap random scattering of seeds, some of which will randomly sprout, produces better outcomes than orderly processes. Some animals will lay multiple eggs, knowing that only a few will survive (relying on the law of large numbers, and also illustrating redundancy in creation). Spray paint uses a random scattering method to evenly coat a large surface. Random processes are used in politics (voting, surveys), economics (stock market), and many other fields.

However, randomness affects us emotionally. It can cause shock and fear (airplane crashes), irritation (machines breaking the day their warranty expires), or amusement (meeting someone when we were thinking of them). It can cause us to feel we lack control over our lives. Although coincidences are more common than we realize, they incite and interact with many beliefs and theories, such as karma, fate, and conspiracies.¹⁶ Statistical data is notoriously misinterpreted and misapplied, as in this humorous statement attributed to George Burns: “If you live to be one hundred, you’ve got it made. Very few people die past that age.” “Fortune tellers” often take advantage of probability theory (as well as people’s

15 Thomas Jay Oord, *The Uncontrolling Love of God: An Open and Relational Account of Providence* (Downers Grove: IVP Academic, 2015): 151.

16 E.g., Gorman and Gorman, *Denying to the Grave*, 7, 35–64.

ignorance of it). When they announce to a crowd, “someone here has an illness that will be healed soon,” this has a high likelihood of being true, given the high rate and variety of illnesses, and their high rate of spontaneous remission.

Overall, knowledge of probabilities can help us plan our days and add a sense of security to our lives. In a world filled with multiple interacting factors, including some chance occurrences, probability theory allows us to increase our knowledge of God’s world. Most philosophers endorse probabilistic models of causation,¹⁷ and most scientists favor a non-deterministic and complex view of causation, best understood through probabilities.¹⁸ Statistician David J. Bartholomew contends that “chance was God’s idea and he uses it to ensure the variety, resilience, and freedom necessary to achieve his purposes.”¹⁹ In fact, some processes operate better through randomness than detailed determinism; it makes more sense for God to create random processes than to oversee every simultaneous event in the interconnected universe using a random number generator; this implies a furtiveness to the deity. Bartholomew insists that “Chance plays a positive role in the world and . . . does not undermine God’s sovereignty.”²⁰

Human Judgment of Event Causation

However, as already mentioned, probabilities can be difficult to understand. Consequently, people tend to adopt simple “cause and effect” explanations for events, especially when they have personal meaning. We prefer certainty to probability. Our misunderstanding of probability in causation is largely unrelated to education or intelligence but thought to be related to our normal cognitive processing abilities.

Judgment and decision making are important in all areas of life, and especially relevant for Christians desiring to follow the will of God. Decisions for the future, as well as appraisal of the past (which may affect future decisions and/or lead to

17 Steven Sloman notes that a “causal relation is probabilistic or is affected by random factors if the combination of known causes isn’t *perfectly* predictive of the effect”; *Causal Models: How People Think about the World and Its Alternatives* (Oxford Scholarship online, 2007): 41; see also J. L. Mackie, *The Cement of the Universe: A Study of Causation* (Oxford: Clarendon Press, 1974, 1980); Stathis Psillos, *Causation and Explanation* (Montreal: McGill-Queens University Press, 2002); Stephen Mumford and Rani Lill Anjum, *Causation: A Very Short Introduction* (Oxford: Oxford University Press, 2013).

18 Illari, Russo, and Williamson, “Why look at Causality in the Sciences?”; Rabins, *The Why of Things*.

19 Bartholomew, *God of Chance* (London: SCM, 1984): 14. Similarly, philosopher Peter van Inwagen acknowledges that God is sometimes a direct causative agent, but denies that he has specific reasons for not preventing every individual misfortune. Since we are all subject to chance, then it is unfair that we should be subject to unequal chances (i.e., that God should help some but not others); van Inwagen, “The Place of Chance in a World Sustained by God,” in Thomas V. Morris, *Divine and Human Action: Essays in the Metaphysics of Theism* (Ithaca: Cornell University Press, 1988): 211–35.

20 Bartholomew, *God, Chance and Purpose: Can God have it Both Ways?* (Cambridge: Cambridge University Press, 2008): 197; see also 124–32.

assumptions of causation and blame) are mediated by our views of how the world works. Making a judgment is complex, involving multiple levels of processing—sensation, perception, identification, association, memory, and rationality. Two cognitive processes can be described: a fast, intuitive one, that makes automatic associations and relies on emotion, and a slow, rational one that relies on logic.²¹ Making quick, automatic judgments is often useful but prone to error. Lack of awareness of the complexity of human judgment has potentially serious consequences.

Judgment errors are common when complex processes are involved and are often a result of faulty logic or using intuitive processes when logical ones are needed. First, we ignore the law of large numbers. For example, when judging the sequence of boys and girls born in a hospital (which are independent events), people incorrectly assume that the sequence, BGBBGB is more likely than BBBGGG or GGGGGG.²² In fact, psychologists Amos Tversky and Daniel Kahneman titled an article “Belief in the Law of Small Numbers,” to describe the observation that most people intuitively assume that the “law of large numbers applied to small numbers as well.”²³ In another study, people judged a disease that kills 1,200 out of 10,000 to be more dangerous than one that kills 24 out of every 100 (the second one is actually twice as lethal, but people are impressed by large numbers and forget the denominator).²⁴

Second, we ignore base rates and misjudge probabilities. This is illustrated by Tversky and Kahneman’s famous “Linda problem”:

Linda is 31 years old, single, outspoken, and very bright. She majored in philosophy. As a student, she was deeply concerned with issues of discrimination and social justice, and also participated in anti-nuclear demonstrations. Which is more probable? 1. Linda is a bank teller. 2. Linda is a bank teller and is active in the feminist movement.

Most people incorrectly choose the second option. But the likelihood of two events occurring together is lower than the probability of either one occurring alone. This is also an example of a conjunction fallacy, assuming things occur together

21 Some of the pioneering work on this was done by Daniel Kahneman and Amos Tversky. See Kahneman, *Thinking, Fast and Slow* (Toronto: Doubleday Canada, 2011); Dan Ariely, *Predictably Irrational: The Hidden Forces that Shape our Decisions* (New York: HarperCollins, 2008); Jonah Lehrer, *How We Decide* (Boston, New York: Houghton Mifflin Harcourt, 2009); Edmund T. Rolls, *Emotion and Decision-Making Explained* (Oxford: Oxford University Press, 2014).

22 Kahneman, *Thinking, Fast and Slow*, 115.

23 Tversky and Kahneman, “Belief in the Law of Small Numbers,” *Psychological Bulletin* 76, no. 2 (1971): 105–110.

24 K. Yamagishi, “When a 12.86% Mortality is More Dangerous than 24.14%: Implications for Risk Communication,” *Applied Cognitive Psychology* 11 (1997): 495–506.

more commonly than alone, and a representative heuristic, our tendency to make judgments based on typicality. This last example, although often correct, is also a source of stereotypes, and has been demonstrated in multiple different studies.²⁵

Third, we discount the role of randomness, being biased towards seeing patterns and meaning where there are none. We are surprised when someone wins a large sum at a casino, when a coin lands on tails four times in a row, or when someone's cancer resolves. A classic study showed subjects randomly moving geometric shapes; invariably people attributed agency and motive to these objects.²⁶ The instinct to find meaning occurs in multiple areas of life that require statistical understanding.²⁷ We assume causal effects when there is merely a correlation, and prefer to attribute happenings to an external agent rather than multiple, possible random or unknown, factors. Philosopher-statistician Nassim Taleb uses the term narrative fallacy to describe our preference for simplified stories over raw truths.²⁸ Indeed, we often invent explanations, or weave a causal web to connect a sequence of facts. But our stories are reductive and our explanations often distorted. Taleb points out potential costs to this fallacy, such as our outrage at an extreme act of terrorism while we ignore the subtle but overall more harmful effects of environmental neglect. He is especially concerned about our tendency to neglect "silent evidence" or focus only on what is known or seen. In a story told by Cicero about a painting of worshipers who survived a shipwreck after praying, a non-believer asked rhetorically to see the pictures of those who prayed and then drowned.²⁹ This relates to our tendency to ignore base rates in favor of meaning (especially when positive).

Psychologists have noted some tendencies, including well-known biases, that

25 E.g., Kahneman and Tversky, "On the Psychology of Prediction," *Psychological Review*, 80 (1973): 237–51; Kahneman and Tversky, "Subjective Probability: A Judgment of Representativeness," *Cognitive Psychology* 3 (1972): 430–54; see summary in Kahneman, *Thinking, Fast and Slow*, 146–65.

26 Known as the Heider-Simmel illusion; F. Heider and M. Simmel, "An Experimental Study of Apparent Behavior," *The American Journal of Psychology* 57, no. 2 (1944): 243–59.

27 Human difficulty with interpreting statistics extends to experts, who are also often inconsistent in their judgments. It has been demonstrated in multiple areas that statistics are superior to clinicians with respect to judgments, perhaps because experts are overconfident. The classic work was done by Paul E. Meehl, *Clinical Versus Statistical Prediction: A Theoretical Analysis and a Review of the Evidence* (Minneapolis: University of Minnesota Press, 1954). See also Matthew Fisher and Frank C. Keil, "The Curse of Expertise: When More Knowledge Leads to Miscalibrated Explanatory Insight," *Cognitive Science* 40 (2016): 1251–69; Kahneman, *Thinking, Fast and Slow*, 222–33.

28 Taleb, *Black Swan*, 62–84.

29 Taleb, *Black Swan*, 100–101. Reid Hastie and Robyn M. Dawes give another example: 90% of airplane-crash survivors surveyed had studied where the exits were; but of course, those who died were not interviewed; Dawes, *Rational Choice in an Uncertain World*, 2nd ed. (San Diego: Harcourt, 2009), 123.

lead to errors in decision making. We are “cognitive misers,”³⁰ making broad generalizations and quick judgments in order to avoid thinking. We are persuaded by anecdotes more easily than by statistics; the former offer meaning and are also more readily available. Kahneman and Tversky found that people deemed “a massive flood somewhere in America in which more than a thousand people die” to be less likely than “an earthquake in California, causing massive flooding, in which more than a thousand people die.” The second, being more specific, even if less probable, offers an easily imagined and meaningful cause.³¹ Generally, cause trumps statistics in decision making.

Our judgment is informed more by emotions than logic, and we favor certainty almost pathologically.³² We have an illusion of understanding and tend to seek conclusions that make us feel good about ourselves and the world. As Taleb notes, we frequently confuse luck with skills, probability with certainty, randomness with determinism, conjecture with certitude, coincidence with causality, and theory with reality; “we favor the visible, the embedded, the personal, the narrated, and the tangible; we scorn the abstract.”³³

Even when confronted with their lack of logic in judgments, people tend to be defensive.³⁴ Our reluctance to acknowledge mistakes is evident in the hindsight bias, or the “I knew it all along” phenomenon.³⁵ People make a logical fallacy by affirming the consequent and ignoring all the other possible outcomes. We also sometimes get the arrow of causality backwards by assuming that our good qualities cause our successes, rather than that success shapes character. Our self-confidence extends to our personal characteristics, knowledge, and abilities. We often give greater weight to information that shows us in a favorable light and assume that we are better than average in most ways. One study showed that people

30 A term used by Keith E. Stanovich, *What Intelligence Tests Miss: The Psychology of Rational Thought* (New Haven: Yale University Press, 2009), 70–85.

31 Tversky and Kahneman, “Extensional Versus Intuitive Reasoning: The Conjunction Fallacy in Probability Judgment,” *Psychological Review*, 90, 4 (1983): 293–315; Kahneman, *Thinking, Fast and Slow*, 160.

32 E.g., Kathryn Schulz, *Being Wrong: Adventures in the Margin of Error* (New York: Harper Collins, 2010).

33 Taleb, *Fooled by Randomness*, 262; Taleb also points out that history books describe a much clearer and meaningful story than empirical reality; *Black Swan*, 8.

34 Jonathan Haidt has observed people inventing bizarre explanations in attempts to explain moral choices that are illogical, such as why they refused to drink juice in which a sterile dead cockroach had been dipped; *The Righteous Mind: Why Good People are Divided by Politics and Religion* (New York: Vintage Books, 2012): 43–45.

35 E.g., Baruch Fischhoff, “For Those Condemned to Study the Past: Reflections on Historical Judgment,” *New Directions for Methodology of Social and Behavioral Sciences* 4 (1980): 79–93. This relates to our illusion of understanding; Taleb, *Fooled by Randomness*, vii–xvii; Kahneman, *Thinking, Fast and Slow*, 199–207.

applying for marriage licenses correctly stated the divorce rate to be 50% but predicted the success of their own marriages to be close to 100%.³⁶

Also, somewhat self-serving, and related to our need to meaning, is the confirmation bias: we only consider information that supports our viewpoints and fail to seek evidence to disconfirm our judgments (Taleb calls this naïve empiricism). The illusion of control describes how people tend to overestimate the degree of personal control we have over events.³⁷ Uncertainty leads to psychological distress; consequently, people use multiple means to increase a sense of control and reduce discomfort (known in psychology as cognitive dissonance theory³⁸). This relates to our preference for skill (which we can control) over luck. We make causal associations between unrelated things and choose what we want to believe, thus decreasing uncertainty.

Although beyond the scope of this article, it is important to note that these errors in judgment are not necessarily sinful, but often simply a consequence of using fast cognitive processes for situations in which slower ones are more accurate. As psychologist Gerald Clore concludes: “The genius of human thought is that despite its unconscious, automatic, emotional, and heuristic nature, we nevertheless generally arrive at rational, defensible conclusions.”³⁹ However, some aspects of our cognitive mistakes, such as self-serving biases, may fall within the Christian category of sin. Many secular writers note human pride as a factor in judgment errors. Kahneman thinks we have an “almost unlimited ability to ignore our ignorance,”⁴⁰ and Taleb suggests that we have hubris with respect to the limits of our knowledge (epistemic arrogance).⁴¹ Philosophers and theologians have noted the relationship between belief, character, desires, and choice regarding acceptance of evidence; the term willful spiritual blindness has been used.⁴²

In sum, the world we live in is complex, characterized by multiple, sometimes random, factors interacting to produce broadly predictable effects over time and

36 L. A. Baker and R. E. Emery, “When Every Relationship is Above Average: Perceptions and Expectations about Divorce at the Time of Marriage,” *Law and Human Behavior* 17, no. 4 (1993): 439–49. In reality, the actual divorce rate is variable and challenging to determine; it is likely lower than 50%.

37 This concept was developed by Ellen J. Langer, “The Illusion of Control,” *Journal of Personality and Social Psychology* 32, no. 2 (1975): 311–28; see also Suzanne C. Thompson, “Illusions of Control: How We Overestimate Our Personal Influence,” *Current Directions in Psychological Science*, Association for Psychological Science 86 (1999): 187–90.

38 The theory was developed by Leon Festinger, *A Theory of Cognitive Dissonance* (California: Stanford University Press, 1957).

39 Clore, “Psychology and the Rationality of Emotion,” in *Faith, Rationality and the Passions*, Sarah Coakley, ed. (Chichester, Suffolk: Wiley-Blackwell, 2012), 213.

40 Kahneman, *Thinking, Fast and Slow*, 201.

41 Taleb, *Black Swan*, 138; see also Schulz, *Being Wrong*.

42 E.g., Kevin Kinghorn, “Spiritual Blindness, Self-Deception and Morally Culpable Nonbelief,” *Heythrop Journal* 48 (2007): 527–45.

space. It is inadequately understood if probabilistic concepts are not part of the total understanding. However, humans have difficulty understanding statistics, probability, and randomness. We tend to apply rules for large numbers to personal, individual circumstances. Our judgment is informed more by emotions than logic. We generally overestimate causality and view the world as more explainable than it actually is; partly because we dislike uncertainty. We make quick, lazy judgments, and tend to be self-serving, seeking conclusions that make us feel good about ourselves and the world. Next we consider Christian theological conceptions regarding divine interaction with our probabilistic world and its flawed inhabitants.

Providence

We inhabit the same universe as that of biblical authors, although we have developed new language to describe occurrences and interactions within it. Given that occurrences in our world include random elements and that the Bible portrays a God who is intimately involved in the world, our understanding of providence needs to allow for both the probabilistic nature of the world and the personal nature of God's relationship with it. Obviously, this issue relates to large theological topics such as the problem of evil, suffering, and omniscience, which cannot all be addressed here.

Randomness and Probability in Christianity

In the Bible, random methods (e.g., casting lots to make decisions) were used on occasion (e.g., Josh 18:6–10; Jon 1:7, Acts 1:26). Many of the disciples, as fisherman, knew that their catches would vary from day to day, and that having a full net after hours of nothing was improbable (John 2:11–6). The Bible also acknowledges that some things occur by chance, not the hand of God (1 Sam 6:9), and that much is uncertain; “Sow your seed in the morning, and at evening let your hands not be idle, for you do not know which will succeed . . .” (Eccl 11:6); “time and chance happen to them all” (Eccl 9:11). Possible random causation is implied in the story of the tower of Siloam (Luke 14:2–5). Regular and predictable processes are described in a general sense but seldom applied to individuals; for example, “The sun rises and the sun goes down” (Eccl 1:5); rain falls “on the righteous and the unrighteous” (Matt 5:45).

Biblical stories also provide illustrations of the law of large numbers, and predictions or general statements often apply to groups rather than individuals. With respect to divine election, the Bible frequently uses corporate terms. God chooses the people of Israel (not individuals) to be his people (e.g., Deut 7:6; Ps 33:12), and they choose him (Josh 24:22). God also chooses followers of Christ to be his

people (1 Pet 2:9); they are described as the “bride” of Christ (Rev 19:7).⁴³ Individuals, like Abraham and Paul, are chosen and directed for specific purposes related to furthering the kingdom of God. At times God holds a group responsible for the behavior of an individual. Peter, in his Pentecost speech (Acts 2:22–24) accuses the Israelites of crucifying Jesus, according to God’s plan. This does not mean that God “planned” for a specific individual but one of a group. The language of individual and community are used somewhat fluidly in the Bible. For example, both Solomon and thousands of laborers built the temple (1 Kgs 5–6).

Of course, there are also many statements in the Bible that refer to divine direction and certainty. When God needs something done, it happens (e.g., his promise to Abraham, his covenant with Israel, the incarnation, crucifixion, and resurrection). Certainty is also used broadly with respect to God’s judgment of sin, his forgiveness, his love for us, our salvation, and his promise to listen. However, occasions of direct intervention always have a theological and/or eschatological purpose. Consequently, many such divine statements are addressed to a community (i.e., Israel, followers of Christ), although commonly misapplied to individual situations; for example, “I know the plans I have for you . . .” (Jer 29:11). In this verse, the prophet is addressing the nation of Israel (which includes individuals who may choose to turn away from God), yet many people apply it to specific circumstances in their individual lives. (Recall our biases toward meaning and certainty.)

Many Christians assume that randomness is incompatible with divine providence and associated with purposelessness. The Heidelberg catechism, with respect to divine providence, states, “. . . all things come to us not by chance but by his fatherly hand.” There appears to be a false dichotomy between “God” and “Chance.” For example, R. C. Sproul believes that the “mere existence of chance is enough to rip God from his cosmic throne. Chance does not need to rule . . . (it is) a humble servant.”⁴⁴ But chance is not a servant, nor any type of personal being. Randomness simply describes patterns of behavior in the world. Personifying

43 Clark Pinnock emphasizes that the purpose of election is for the “chosen” people to be a vehicle of salvation for all people; Pinnock, “Divine Election as Corporate, Open, and Vocational,” in *Perspectives on Election: Five Views*, Chad Brand, ed. (Nashville: Broadman & Holman, 2006): 276–313; see also Gregory A. Boyd, *Satan and the Problem of Evil* (Downers Grove: IVP, 2001): 117–21. Maurice Wiles notes that Old Testament prophecies point to wider pattern of fulfillment, rather than to individuals; *God’s Action in the World* (London: SCM Press, 1986): 54–69.

44 Sproul, *Not a Chance: The Myth of Chance in Modern Science and Theology* (Grand Rapids: Baker, 1994, 2014), 3; see also Vern S. Poythress, *Chance and the Sovereignty of God* (Wheaton: Crossway, 2014). Biblical scholar Bruce Waltke states that providence often appears as chance but “nothing happens to Christians by chance.” However, the focus of his book is that God does not intervene when we seek his will (his will for us is to mature in Christ), and we should not read too much into circumstance. Waltke, *Finding the Will of God: A Pagan Notion?* (Grand Rapids: Eerdmans, 1995, 2002): 121–42. This view is common at a popular level; e.g., Rick Warren claims that “because God is sovereignly in control, accidents are just incidents in God’s good plan for you.” *The Purpose Driven Life* (Grand Rapids: Zondervan, 2002), 195.

chance risks diminishes the sovereignty of God. This view of randomness, and by implication probability, is associated with a strong view of divine determinism and an omni-causality model of providence. I believe it does not fully reflect the biblical witness and does not reflect the nature of created reality.⁴⁵

Others view randomness as not only compatible with but beneficial to Christian theology. William Pollard, in his classic work, states that “the key to . . . providence in the form in which we as Christians perceive it, is to be found in the appearance of chance and accident in history.” “Only in such a world could the course of events be continuously responsive to the will of its Creator.”⁴⁶ Biblical scholar Terence Fretheim suggests that God created the world with some disorderliness and to allow for human participation and creativity.⁴⁷ Creation is reliable, but not static and predictable. Albeit from different perspectives, both scholars point to the importance of randomness to the God-world relationship. Theologian Gregory A. Boyd similarly observes that life appears arbitrary because it “embodies an element of chance,” which is “a beautiful mystery.”⁴⁸ Because there are multiple causes for events, it is hard to know where to assign responsibility. Rob A. Fringer and Jeff K. Lang develop a “theology of luck,” which “shapes a worldview that makes it possible to move from fate (which he equates with a deterministic view of providence) —through chaos—to faith.” It is a loving God who creates a world with both purpose and possibility, and there is not necessarily an overarching reason for every occurrence in life.⁴⁹ Christian philosopher Christian J. Barrigar points out the degree of randomness and indeterminacy in the universe and suggests that God created the world with statistical laws to allow for “predictability-within-freedom.” “The universe constitutes a massive ‘multidimensional probability space,’ created by God to provide the conditions for an

45 The view of divine determinism has been much critiqued; e.g., Clark H. Pinnock, R. Rice, J. Sanders, W. Hasker, and D. Basinger, *The Openness of God: A Biblical Challenge to the Traditional Understanding of God* (Downers Grove: IVP, 1994); David J. Bartholomew, *Uncertain Belief: Is it Rational to be a Christian?* (New York: Clarendon Press, 1996); Jerry L. Walls, and Joseph R. Dongell, *Why I am not a Calvinist* (Downers Grove: IVP, 2004); Oord, *Uncontrolling Love*.

46 William G. Pollard, *Chance and Providence: God's Action in a World Governed by Scientific Law* (London: Faber and Faber, 1959), 66, 73.

47 Terence E. Fretheim, *Creation Untamed: The Bible, God and Natural Disasters* (Grand Rapids: Baker Academic, 2010).

48 Boyd, *Satan and the Problem of Evil*, 387; he includes an appendix on the theology of chance (386–93).

49 Rob A. Fringer and Jeff K. Lang, *Theology of Luck: Fate, Chaos, and Faith* (Kansas City, MO: Nazarene Publishing House, 2015): 62, 44. Peter van Inwagen also claims that not everything that occurs in the world has a particular purpose. He cautions against confusing God's care for and knowledge of the world with God directly causing every event; e.g., there is a difference between God counting the hairs of our head (Luke 12:7) and the number of our hairs being part of God's plan. Because the physical world appears to be indeterministic, many things occur apart from the divine will; van Inwagen, “The Place of Chance.”

equally-massive directed random walk.”⁵⁰ These theologians point to the value of chance in the created order and its reflection of a flexible God who values interaction with his creatures and his creation.

Many scientist-theologians acknowledge the importance of randomness and indeterminacy in a world that involves multiple factors interacting in complex manners. Contemporary scientific observations mean that the universe is open, and best viewed as indeterministic. Recalling Polkinghorne’s claims about ontology, if there appear to be random occurrences, there probably are. He views randomness in a positive light; it represents freedom, not purposelessness. Creation is gifted with both reliability and independence; both order and disorder and needed. “Chance is the engine of novelty. Necessity is the preserver of fruitfulness.”⁵¹ Arthur Peacocke similarly describes chance as “the search radar of God, sweeping through all possible targets of its probing.”⁵²

Although this discussion is necessarily brief, it does seem that the indeterministic, probabilistic nature of the world is affirmed within the Bible and Christian thought. It should be emphasized that randomness does not equal disorder or purposelessness and does not negate God’s love for us. Life is more complex than we would like it to be, but Christians can trust in a sovereign God who cares deeply for creation. We now consider how to understand the theological notion of providence.

Definitions and Models of Providence

Providence is commonly viewed as the benevolent guidance of God. Thomas Jay Oord’s definition is succinct: “the ways God acts to promote our well-being and the well-being of the whole world.”⁵³ It includes ideas of sustenance, continuing creation, preservation, governance, and concurrence or cooperation. Providence is often categorized into general and special, ordinary and extraordinary, natural and supernatural, or indirect and direct divine action.⁵⁴ God usually acts generally, preserving creation, but also acts directly and specifically on occasion. However, these categories are not easily separated. This can be illustrated through a brief foray into the much-misunderstood concept of miracle.

Miracles are often considered a type of special divine action or intervention. There are problems when it is viewed too narrowly, such as restricting the concept

50 Barrigar, *Freedom All the Way up: God and the Meaning of Life in a Scientific Age* (Victoria: Friesen): 47. He focuses on origins and suggests that the emergence of humans was a highly probable event based on the conditions God created initially.

51 Polkinghorne, *Quarks, Chaos and Christianity*, 53; he further notes that “novelty emerges at the edge of chaos,” *Exploring Reality*, 144.

52 Peacocke, *Creation and the World of Science* (Oxford: Oxford University Press, 2004), 95.

53 Oord, *Uncontrolling Love*, 16, 17.

54 E.g., Michael J. Langford, *Providence* (London: SCM, 1981).

to verifiable violations of natural laws,⁵⁵ because this minimizes the theological import associated with miracles, overemphasizes divine transcendence, implies God is little involved in the ordinary, natural world, and comes close to a demythologized or deist view. Narrow views of miracles also risk viewing God as capricious, randomly acting in the world, as opposed to recognizing the presence of randomness within creation. There are also problems with viewing miracles too broadly because this again minimizes biblical and theological associations, overemphasizes divine immanence (or panentheism), can be very subjective, and may trivialize the concept. Perhaps the term “miracle” should not be used, along with the equally unclear, unbiblical distinction between “natural” and “supernatural.” As William Pollard notes, “If a miraculous event could only happen outside the natural order of things, then it would necessarily imply that it would be unnatural for God to exercise providence over his creation. Such an idea is, however, clearly un-biblical.”⁵⁶ Broad definitions of miracle are more palatable, such as Oord’s: “an unusual and good event that occurs through God’s special action in relation to creation.”⁵⁷ In general, miraculous events demonstrate consistency with God’s character as depicted in the Bible, have spiritual/theological significance, inspire awe, and are counterintuitive. It also may help to recognize the distinction between general and special providence as simply theoretical. In reality, these intertwine, as the Spirit flows over, within, and through creation.

Thomas F. Torrance, using scientific analogies, suggests that miracles involve *recreation* of original order in situations where decay and disorder have occurred, rather than *suspension* of natural order.⁵⁸ He implies that counteracting the natural randomness and unnatural sin in the world is a form of miracle, and that God acts from within creation as opposed to acting from outside of it. I suggest it may be more fruitful to focus on divine presence rather than divine action, which are

55 Miracles were defined by Hume as occurrences that violated the laws of nature; e.g., Evan Fales, *Divine Intervention: Metaphysical and Epistemological Puzzles*. (London: Routledge, 2010), esp. 22–39; Juuso Loikkanen, Juuso. “Does Divine Action Require Divine Intervention? God’s Actions in the World and the Problem of Supernatural Causation.” *Research and Science Today* 2 (2015): 17–27; Oord, *Uncontrolling Love*, 187–216.

56 Pollard, *Chance and Providence*, 118. Further, the majority of “miracles” recorded in Scripture “are the result of an extraordinary and extremely improbable combination of chance and accidents. They do not, on close analysis, involve, . . . a violation of the laws of nature” (83). Harrison and Roberts note that prior to Aquinas, there was no “natural/supernatural” distinction; the distinction developed partly as a result of the formal evaluation of miraculous events; Peter Harrison and Jon H. Roberts. *Science Without God?: Rethinking the History of Scientific Naturalism*. (Oxford: Oxford Scholarship Online, 2019).

57 Oord, *Uncontrolling Love*, 196. New Testament scholar Graham H. Twelftree defines miracle as an astonishing event “carrying the signature of God.” *Jesus the Miracle Worker*: (Downers Grove: IVP, 1999): 24–27, 350.

58 Torrance, *Divine and Contingent Order* (Oxford: Oxford University Press, 1981), 116–22; he also suggests this helps with the problem of evil, which may occur at the edge of contingent realities bordering on nothing.

perhaps two sides of the same coin; a presence that cleanses creation, instills holiness and wholeness, gifts grace, and prods toward perfection.⁵⁹

Returning to providence in general, multiple models have been proposed.⁶⁰ Some scholars claim that we cannot know anything (“God’s ways are not our ways”), but I think agnosticism is unhelpful, although we always need to accept some degree of mystery. Somewhat similarly, various versions of deism and process theology, which discount special providence, do not explain the many biblical and experiential stories of God lovingly interacting with his world. This leaves two primary categories.

The traditional (classic, Augustinian-Calvinistic) view of providence, in its extreme form, can be described as deterministic; God exhibits omni-causality, and meticulous control.⁶¹ There is consequently little distinction between general and special providence. However, this view is often inconsistently held; for example, people often claim determinism with respect to providence but free will with respect to salvation.⁶² A traditional view is difficult to reconcile with freedom, moral responsibility, and randomness. Although some find this view comforting, we should not sacrifice accuracy for comfort.⁶³ A variation on the classical view is the Thomistic idea of double agency or concursus. In this understanding, God is the powerful, primary cause who may also direct free will; humans are only secondary causative agents.⁶⁴ This is an improvement on a strict deterministic view in that it allows for human agency, but leaves multiple conundrums, such as human refusal to cooperate with the divine will, and the potential arbitrary nature of divine action.

59 Jürgen Moltmann states, “the presence of the infinite in the finite imbues every finite thing . . . with self-transcendence.” Moltmann, *God in Creation*. 2nd ed., trans. Margaret Kohl (Minneapolis: Fortress, 1993): 101. The sacramental nature of creation is emphasized in Eastern Orthodoxy; e.g., Christopher Knight suggests that divine action is subtle and, instead of breaking into the world, it is a manifestation of the true reality that is already present but hidden in creation. *The God of Nature: Incarnation and Contemporary Science*, Theology and the Sciences (Minneapolis: Fortress, 2007), esp. 86–95, 134–38.

60 Terrance Thiessen describes ten existing models and adds one of his own. Thiessen, *Providence and Prayer: How Does God Work in the World?* (Downers Grove: IVP, 2000). Oord counts seven models in *Uncontrolling Love*; and Gundry and Jowers include four. Stanley N. Gundry and Dennis W. Jowers, eds., *Four Views on Divine Providence* (Grand Rapids: Zondervan, 2011).

61 E.g., Paul Helm, *The Providence of God* (Downers Grove: InterVarsity Press, 1994); Ron Highfield, *The Faithful Creator: Affirming Creation and Providence in an Age of Anxiety* (Downers Grove: InterVarsity, 2015).

62 Thiessen makes this point. *Prayer and Providence*, 14–20; see also note 42 above.

63 Bartholomew suggests we should be concerned with “what is true not what is comforting.” Bartholomew, *God of Chance*, 121.

64 Austin Farrer famously refers to “double agency.” *Faith and Speculation* (London: Adam & Charles Black, 1967): 104–105. Joshua Reichard critiques this view, noting that “a logical quandary exists between relying on God as a primary cause or precondition to human action and holding human beings personally accountable for their actions.” “Beyond Causation: A Contemporary Theology of Concursus,” *American Journal of Theology & Philosophy* 34, no. 2 (2013): 117–34. The type of concursus associated with the traditional view is sometimes called prior or permissive.

The other major view emphasizes freedom (primarily human, but the spirit world, and nature itself also have some degree of freedom, though not moral responsibility) and divine restraint.⁶⁵ Variations are that God intentionally exercises self-restraint or is by nature essentially kenotic. Although some versions of this view can emphasize God's inaction rather than his action, it allows for a non-deterministic world, including randomness and probability, and an intimately involved Creator. Events can be overdetermined, with multiple causal factors that can produce the same outcome, in order to allow for all possible contingencies.⁶⁶ As mentioned above, God acts from within creation to effect change. Furthermore, in this view, humans have genuine freedom: God does not impose his will on them, although he may orient people toward positive action.⁶⁷ Fringer and Lane point out that it is a loving, servant God that refuses to dominate or control everything. He "creates with purpose but also with possibilities."⁶⁸ Boyd summarizes: "God's providence does not need to be meticulously controlling on the level of free agents to ensure that his sovereign plan for the world will be accomplished."⁶⁹ These perspectives imply a more fluid relationship between general and special providence, and do not discount the possibility of divine intervention.

Some theologians briefly refer to statistical probability in their arguments that biblical texts refer more to groups than individuals and that divine predictions refer primarily to groups, not individuals. Boyd notes that God often exhibits foreknowledge in the same way that insurance and advertising agencies operate, by predicting group but not individual behavior.⁷⁰ Uncertainty, randomness, and probability require risk; many argue that it takes a "bigger" God to allow risk, rather than one who controls absolutely everything.⁷¹ Oord suggests that an "adventure model of providence," with calculated risks, free decisions, and some

65 E.g., John Sanders, *The God Who Risks* (Downers Grove: IVP, 1998); Gregory A. Boyd, "God Limits His Control," in *Four Views of Divine Providence*, 183–208; Oord, *Uncontrolling Love*, 81–105.

66 One example is the Exodus story, in which divine action is intermingled with human agency and natural causes; Langford, *Providence*, 42–45.

67 This is sometimes known as conferred concursus. Vincent Brümmer states: "double agency is a matter of co-operation between two agents and not of one agent using the other as a tool." Brümmer, "Farrer, Wiles and the Causal Joint," *Modern Theology* 8 (1992): 1–14 (5).

68 Fringer and Lane, *Theology of Luck*; Jürgen Moltmann similarly points out that a god whose primary action is to control things is not worth following and does not describe the God who suffered and died on the cross. *The Crucified God: The Cross of Christ as the Foundation and Criticism of Christian Theology* (London: SCM, 1974), 223.

69 Boyd, *Satan and the Problem of Evil*, 153.

70 God can foreknow behavior based on his knowledge of a person's character or typical behavior (e.g., Judas's betrayal, Peter's denial). Boyd, *God of the Possible* (Grand Rapids: Baker, 2000): 33–48.

71 E.g., Bartholomew concludes that "the possibility of a world capable of supporting each individual, tested and tempered by the uncertainties of life and destined for union in Christ seems to demand risk on the grand scale." Bartholomew, *God, Chance and Purpose*, 240.

randomness, fits our world of “genuine good and evil, randomness and regularity, freedom, agency, disappointments, and even miracles.”⁷²

In sum, a view of providence in which God relinquishes some responsibility to humans, and allows random, probabilistic occurrences in nature—a view in which intimate divine presence is emphasized and the immanence/transcendence categories are blurred—is both theologically robust and clearly compatible with the world described by scientific observations. God can and will achieve his aims for those who choose to follow him, although he may likely use multiple manners to do so.

Pastoral Implications and Applications

A friend expressed discouragement when his pastor praised the work of two small groups in his church, which is large and emphasizes small groups. Although he was not interested in that type of ministry, he felt his group was failing. I reassured him, noting that the sample size was two out of 52. Statistics can comfort. On another occasion, I met someone in a parking lot who became a friend. She claimed that this was “God’s plan.” With a sheepish grin, recognizing that theologians can be irritating, I acknowledged that there was a high probability that God was involved in orchestrating our meeting.

There are multiple ways that an understanding of providence and probability can benefit the Christian community. First, it provides a more accurate view of the world and God’s interactions with it. Statistics and probability theory can be a helpful tool to describe and understand the world God has created. It is an indeterministic world in which multiple causative factors intertwine, coincidences occur more often than we think, and randomness can be purposeful. We do not need to be experts but can adopt some statistical tools, perhaps using numbers to convey uncertainty. For example, we can consider base rates before making pronouncements of divine intervention. The success of crops growing and babies being birthed have high base rates because the world is designed to be self-perpetuating. Similarly, sunshine and rain follow random patterns, affecting righteous and unrighteous alike, irrespective of prayer. This is reason for praise and thanksgiving!

Many cognitive scientists have made suggestions to help mitigate errors in judgment. Kahneman notes the importance of practice in developing cognitive skills, especially with respect to knowing when intuition can be relied upon. We need to slow down, avoid generalizing, review similar situations, and consider

72 Oord, *Uncontrolling Love*, 220; see also 151–60. This view of a God who does not unilaterally control his creation is also being expressed in some popular writing; e.g., Kate Bowler, *Everything Happens for a Reason: And Other Lies I’ve Loved* (New York: Random House, 2018).

worst- and best-case scenarios.⁷³ Journalist Jonah Lehrer, in reviewing cognitive processing research, suggests that if a problem is novel, we should always employ rational processes; a decision that is not that important requires less “thinking.” We can remind ourselves of what we do not know, and always consider competing hypotheses. Yet we should also pay attention to our emotions, which often reflect unconscious desires and knowledge.⁷⁴ Psychologists Gilovich and Ross suggest that adoption of appropriate cognitive strategies is a hallmark of wisdom: taking a broad view of situations, considering the views of others, especially experts, considering alternate ways of framing an issue, understanding the primacy of behavior, choosing words wisely, and shaking off the limits of naïve realism.⁷⁵

If we have such difficulty understanding how the world that God made works, perhaps we need to be less certain when considering how God works! Theologians, without referencing cognitive psychology, have often noted the inconsistency present in Christian piety. Austin Farrer tells a story of how a man’s illness is first judged to be a result of his drinking, then when it is discovered he does not drink, it is redefined as a trial. When his illness prevents him from going on a trip that ends in disaster, it is then considered a blessing of providence.⁷⁶ Recognizing the complexity of creation and God’s involvement with it can improve our consistency; we can praise God for all aspects of nature, not just those that are pleasing or convenient to us. We can delight in the complexity of creation, and speak confidently in probabilistic language, knowing that divine providence incorporates both ontological and epistemological randomness. We can also be reminded of our responsibility in aligning ourselves with the general will of God and working with God in building his kingdom. Perhaps we should focus less on circumstances in our individual lives and more on our relationship with our Creator, as in the two verses that *follow* Jer 29:11: “Then you will call on me and come and pray to me, and I will listen to you. You will seek me and find me when you seek me with all your heart.”

Second, knowledge of our cognitive shortcomings, especially our self-serving biases, can foster humility and encourage spiritual growth. Our fear of uncertainty represents mistrust in God. This may lead us to adopt cognitive biases (e.g., narrative fallacies) that provide (false) security and increase our sense of confidence and control. Paradoxically, strong proclamations about divine control over everything in life may reflect less a strong faith than an anxiety about lack of control.

73 Kahneman, *Thinking, Fast and Slow*, 240, 417.

74 Lehrer, *How We Decide*, 243–50.

75 Thomas Gilovich and Lee Ross, *The Wisest One in the Room: How You can Benefit from Social Psychology’s Most Powerful Insights* (New York: Free, 2015): 267–69. They quote Matt 7:3 (the speck in your neighbor’s eye . . .) to point out that it is easier to see bias in others than ourselves (28).

76 Farrer, *Faith and Speculation* (London: A&C Black, 1967): 68.

Being aware of our need for certainty and control, of our preference for meaning and anecdote, and of our self-serving biases may improve our relationships with God and others. We can cultivate the language of doubt with respect to particular events but certainty with respect to God's loving concern for his creation and creatures. We can focus on character rather than circumstance, availing ourselves of the multiple possibilities for spiritual growth and kingdom service offered through general providence.

Finally, knowledge of probability and providence can inform our pastoral care and aid our discernment skills, although always secondarily to reliance on the Holy Spirit. We can remind sufferers of the multiplicity of causal factors. We can avoid mentioning only positive outcomes and be aware of silent sufferers, harboring guilt because their prayer was not answered. With respect to discerning divine action, while affirming that God does act in creation and in our lives, we should exercise caution, remembering the multiplicity of factors involved in any occurrence as well as God's respect for freedom and his preference for care over control. Some theologians, writing on discernment, note that decision making has both cognitive and emotional components. They recommend that we avoid narrow intellectual paradigms, be aware of our fallibility, and actively, prayerfully participate in Christian communities.⁷⁷ I further suggest that statistical theory may offer guidance with respect to discerning divine action. With respect to the evaluation of miracles, Christopher Knight helpfully points out the differences in perspective: a physicist would assess a miracle based on the event probability and the witness reliability; a theist would assess it according to its function as a sign of God's activity and its compatibility with what is known about divine purposes.⁷⁸ I suggest that both can be helpful. For example, a low probability event with spiritual significance, perhaps associated with extraordinary amounts of prayer, may be viewed as divine intervention.

The triune Lord is the ultimate creator, redeemer, and sustainer. We can be certain of God's love for us, our salvation through Christ, and the ubiquitous presence of the Holy Spirit. We can also be certain of his desire for us to be transformed into his likeness, to care for his creation, and to share the Good News. However, we should also delight in mystery and avoid attributing every event in our lives to the direct action of God. Divine providence renders creation a probabilistic space with multiple potentialities. Consequently, probability theory can provide a helpful perspective on divine providence.

77 E.g., Evan B. Howard, *Affirming the Touch of God: A Psychological and Philosophical Exploration of Christian Discernment* (Lanham: University Press of America, 2000); Gordon T. Smith, *The Voice of Jesus* (Downers Grove: IVP, 2003); Dallas Willard, *Hearing God: Developing a Conversational Relationship with God*. 4th Ed. (Downers Grove: IVP, 2012).

78 Knight, *God of Nature*: 36–40.