



Determinisms

Determinism is the idea that everything that happens, including all human actions, is completely determined by prior events. There is only one possible future, and it is completely predictable in principle, most famously by Laplace's Supreme Intelligent Demon, assuming perfect knowledge of the positions, velocities, and forces for all the atoms in the void.

More strictly, I strongly suggest that determinism should be distinguished from **pre-determinism**, the idea that the entire past (as well as the future) was determined at the origin of the universe.

Determinism is sometimes confused with **causality**, the idea that all events have causes. Despite DAVID HUME's critical attack on the necessity of causes, and despite compatibilists' great respect for Hume as the modern founder of compatibilism, many philosophers embrace causality and determinism very strongly. Some even connect it to the very possibility of logic and reason. And Hume himself believed strongly, if inconsistently, in necessity. "'tis impossible to admit any medium betwixt chance and necessity," he said.

Bertrand Russell said "The law of causation, according to which later events can theoretically be predicted by means of earlier events, has often been held to be *a priori*, a necessity of thought, a category without which science would not be possible."¹

But some events may themselves not be completely determined by prior events. This does not mean they are without causes, just that their causes are probabilistic. Such an event is then indeterminate. It might or might not have happened. It is sometimes called a "*causa sui*" or self-caused event. But a probabilistically caused event may in turn be the adequately deterministic cause for following events. These later events would therefore not be predictable from conditions before the uncaused event. We call this "soft" causality. Events are still caused, but they are not always predictable or completely pre-determined.

¹ Russell (1960) p. 179



Uncaused events are said to break the “causal chain” of events back to a primordial cause or “unmoved mover.” ARISTOTLE’S “accidents” and EPICURUS’ “swerve” are such uncaused causes.

There is only one basic form of indeterminism. There is only one irreducible freedom, based on a genuine randomness that provides for a world with breaks in the causal chain. Quantum mechanics is the fundamental source for irreducible objective indeterminacy and unpredictability in the physical, biological, and human worlds.

By contrast, there are many determinisms, depending on what pre-conditions are considered to be determinative of an event or action. This chapter identifies more than a dozen distinguishable determinisms, though they overlap a great deal.

Philosophers and religious thinkers may feel ill-equipped to discuss the conflict between a physical freedom based on quantum physics and their own particular (logical or physical) determinism. Because interpretations of quantum mechanics are difficult even for physicists, most recent philosophers dodge the issue and declare themselves agnostic on the truth of determinism or indeterminism.

Even some philosophers who accept the idea of human freedom are uncomfortable with the randomness implicit in quantum mechanics and the indeterminacy principle. True chance is problematic, even for many scientists. This included some, like MAX PLANCK, ALBERT EINSTEIN, and ERWIN SCHRÖDINGER, who discovered the quantum world. And for traditional philosophers in a religious tradition, chance has been thought to be an atheistic idea for millennia, since it denies God’s foreknowledge. Chance, they say, is only epistemic, the result of human ignorance.

But quantum indeterminacy is real and ontological. There is objective chance in the physical world.

The Determinisms

Actualism is the idea that only whatever actually happens could ever have happened. It denies the existence of alternative



possibilities for actions. This idea began with the logical sophistry of DIODORUS CRONUS' **Master Argument** for determinism. Statements about a future event that are true today necessitate the future event.

Sophisticated defenses of this idea include the so-called Frankfurt cases, which claim that an agent's actions can be free even if a hypothetical intervening controller can change the agent's decisions, preventing any alternative possibilities that might have appeared as what JOHN MARTIN FISCHER calls "flickers of freedom."

Behavioral Determinism assumes that our actions are reflex reactions developed in us by environmental or operant conditioning. This is the Nurture side of the famous Nature/Nurture debate - note that both are determinisms. This view was developed to an extreme by B. F. Skinner in the early 20th century, who had great success "programming" the behaviors of animals, but never with perfect control of behavior. Many cognitive scientists are behaviorists who see the mind as a computer that has been programmed, by accident or deliberately, by education, for example.

Biological Determinism finds causes for our actions in our genetic makeup. This is the Nature side of the Nature/Nurture debate. Again, both sides are determinisms. There is little doubt that our genes pre-dispose us to certain kinds of behavior. But note that our genes contain a miniscule fraction of the information required to determine our futures. Most of the information in the adult brain is acquired through life experiences.

Causal Determinism assumes that every event has an antecedent cause, in an infinite causal chain going back to ARISTOTLE'S Prime Mover. Nothing is uncaused or self-caused (*causa sui*). GALEN STRAWSON supports this view with his Basic Argument. Note that there are always multiple causes for any event. Basically, all the events that are in the past light-cone of an event can have a causal relationship with the event.

Cognitive Science Determinism results from a computational model of mind that sees the mind as a computer. The mind may



be evolving its own computer programs, but the overall process is completely pre-determined, say cognitive scientists, and philosophers like DANIEL DENNETT.

Fatalism is the simple idea that everything is fated to happen, so that humans have no control over their future. Notice that fate might be an arbitrary power and need not follow any causal or otherwise deterministic laws. It can thus include the miracles of omnipotent gods, and thus be a theological fatalism. Some philosophers use the term fatalism loosely to cover other determinisms. RICHARD TAYLOR's well-known article, *Fatalism*, in the *Philosophical Review*, was about logical arguments denying future contingency. The Idle Argument claimed that since things are fated, it is "idle" to take any actions at all, since they can have no effect.

Historical Determinism is the dialectical idealism of Hegel or the dialectical materialism of Marx that are assumed to govern the course of future history. Marxists have often felt they could revise the past to suit their purposes, but claimed that the future is economically determined.

Logical Determinism reasons that a statement about a future event happening is either true or it is not true. This is the Principle of Bivalence and the Law of the Excluded Middle. If the statement is true, logical certainty then necessitates the event. ARISTOTLE'S Sea Battle and DIODORUS CRONUS' Master Argument are the classical examples of this kind of determinism. If the statement about the future is false, the event it describes can not possibly happen. In logic, as in other formal systems, truth is outside of time, like the foreknowledge of God. Fortunately, logic can constrain our reasoning, but it cannot provide us with knowledge about the physical world nor can it constrain the world.

Linguistic Determinism claims that our language determines (at least limits) the things we can think and say and thus know. The Sapir-Whorf hypothesis claims that speech patterns in a language community constrain the conceptual categories of a linguistic community and thus determine thought.



Mechanical Determinism explains man as a machine. If Newton's laws of classical mechanics govern the workings of the planets, stars, and galaxies, goes the argument, surely they govern man the same way. Note that although RENÉ DESCARTES described human bodies and all animals as deterministic machines, he said that the human mind was free and undetermined (*indeterminata*).

Necessitarianism is a variation of logical and causal determinism that claims everything is simply necessary. This was LEUCIPPUS' view at the beginning of determinism. This was the most popular name for determinists in the 18th century, when they were opposed to libertarians.

Neuroscientific Determinism assumes that the neurons are the originators of our actions. "My neurons made me do it." The Libet experiments have been interpreted to show that decisions are made by the brain's neurons significantly before any action of conscious will.

Nomological Determinism is a broad term to cover determinism by laws, of nature, of human nature, etc.

Physical Determinism extends the laws of physics to every atom in the human mind and assumes that the mind will someday be perfectly predictable, once enough measurements are made. The paradigmatic case is that of Laplace's Demon. Knowing the positions, velocities, and forces acting on every particle in the world, the demon can know the entire past and future. All times are visible to such a super intelligence.

Psychological Determinism is the idea that our actions must be determined by the best possible reason or our greatest desire. Otherwise, our acts would be irrational. Since all the possible actions are presented to the mind, determined by prior actions, the choice is not really made by the agent.

Pre-determinism claims that everything that ever happens was pre-determined at the beginning of the universe. Theological predestination is similar, but if God is assumed to be omnipotent, the events may have been pre-destined more recently. Some



theologians insist that God is unchanging and outside of time, in which case predestination reduces to pre-determinism.

Religious or Theological Determinism is the consequence of the presumed omniscience of God. God has foreknowledge of all events. All times are equally present to the eye of God (Aquinas' *totem simul*). Note the multiple logical inconsistencies in the idea of an omnipotent, omniscient, benevolent God. If God knows the future, he obviously lacks the power to change it. And if benevolence is assumed, it leads to the problem of evil.²

Spatio-temporal Determinism is a view based on special relativity. The "block universe" of HERMANN MINKOWSKI and ALBERT EINSTEIN is taken to imply that time is simply a fourth dimension that already exists, just like the spatial dimensions. The one possible future is already out there, up ahead of where we are now, just like the city blocks to our left and right. J. J. C. SMART is a philosopher who holds this view. He calls himself "somewhat of a fatalist."

Finally, **Compatibilism** is the idea that Free Will is compatible with Determinism. Compatibilists believe that as long as our Mind is one cause in the causal chain then we can be responsible for our actions, which is reasonable. But they think every cause, including our decisions, are **pre-determined**. Compatibilists are Determinists. Although some modern compatibilists say they are agnostic on the truth of determinism (and indeterminism).

Some of these determinisms (behavioral, biological, historical-economic, language, and psychological) have demonstrable evidence that they do in fact constrain behaviors and thus limit human freedom. But others are merely dogmas of determinism, believed primarily for the simple reason that they eliminate random chance in the universe.

Chance is anathema to most philosophers and many scientists. But without **indeterminacy**, there are simply no possibilities for the world to be different from what these many determinisms claim that it will be.

2 See page 5.



Do the Laws of Physics Deny Human Freedom?

Of all the determinisms listed here, physical determinism stands out as a special case.

All the fanciful logical, theological, and nomological determinisms described here are basically just ideas.

ISAAC NEWTON's classical mechanics was also an idea at first, of course, just a theory.

But then it was confirmed experimentally, by observations that have grown more and more accurate with every passing decade.

To be sure, the theory has been revised and refined, first for the case of matter moving at velocities that are a significant fraction of the speed of light. ALBERT EINSTEIN's special theory of relativity goes beyond classical mechanics, but it asymptotically approaches the classical theory as velocities go to zero.

The next grand refinement was Einstein's general theory, but it too corresponds to ordinary Newtonian physics in the limit.

The most important refinement is the quantum mechanics of WERNER HEISENBERG and NEILS BOHR. Again, it corresponds to the classical theory, in the limit of large numbers of particles.

When ARTHUR STANLEY EDDINGTON revised his 1927 Gifford lectures for publication as *The Nature of the Physical World*, there he dramatically announced

“It is a consequence of the advent of the quantum theory that physics is no longer pledged to a scheme of deterministic law.”¹

There is nothing in the laws of physics, or any wider “laws of nature,” that in any way puts constraints on human freedom.

1 Eddington (2005)

