

Possibility

What is necessary cannot possibly be false, and what is possible is not necessarily false. Given this interdefinability, which has priority? Is reality grounded in its possibilities, or in its necessities? Either way, the world is full of possibilities, which are of great metaphysical interest. A starting point says that at least what is actual is obviously possible, but even then its actualisation may no longer be possible (like owning a cheap house in London). In mathematics and logic there are no situations which are merely possible, because all possibilities are laid out in set theory, so possibility seems to concern the natural world. In the natural world we can attempt to pick out major types of possibility. Possibility seems to start in particulars, like the possibility of reaching a book, and gradually broaden in scope. There are human possibilities, legal possibilities, and possibilities relative to this planet. Three major types of possibility are normally identified (matching the types of necessity), which are natural, logical, and metaphysical.

Natural possibility is what is allowed by the state of our universe (grounded in laws of natures, or existing substances). Natural possibility appears to come in degrees, where dropping a pen is easy, but creating a large planet made of platinum is close to impossible, even though it is allowable in principle. But is it naturally possible that there exist a different universe, which extends the range of these possibilities? It is hard to answer that. Possibilities such as stronger gravity or lighter electrons may be imaginable, but human imagination may be a poor guide to such matters. Epistemic possibility (possible 'for all I know') doesn't seem to be an important aspect of reality.

Logical possibility may simply be inferred if there is no contradiction present, but it is usually extended to include conceptual possibility, since this too may rest on contradiction. Thus a shape cannot be and not-be a square, as that is contradictory, and a shape cannot be both a square and a circle, because they are different concepts of shape, and also would lead to contradictions. Some very bizarre scenarios seem to qualify as logically possible, so logical possibility is normally taken to be of vast scope, and many situations are '*merely* logically possible', even though they cannot be taken seriously. We can think of possibilities being 'ruled out'; if logic rules it out, it is a non-starter, but if logic allows it, it may still be ruled out by other constraints.

As in the case of necessity, **metaphysical** possibility is the least clear type. What is naturally possible in this universe is quite narrow, and what is logically possible is vast, but the huge array of options between the two (logically possible, but naturally impossible) also invites evaluation. If we consider every conceivable combination among what could exist, and eliminate the contradictions (the logical impossibilities), how things could then go seems to be a matter of metaphysical possibility. For example, could a surface be entirely red and entirely green, or could I be taller than you and also you taller than me? Could past events still be modified? Speculations about metaphysical possibility initially look absurdly arrogant, but may break down into quite common sense understanding of how things can be. We note that the vast logical possibilities include the narrower metaphysical possibilities, which include the narrowest natural possibilities. With necessities it was less clear, but logical necessities are very narrow, and many would say that natural necessities are non-existent, while metaphysical necessities may be too speculative to be properly mapped.

Philosophers ask whether elusive 'possibilities' might be reduced to something more clear and tangible. For example, the '**combinatorial**' theory of possibility says all possibilities are fixed by the combinations of currently existing objects and properties. This offers a grounding for what could possibly occur (at least in nature), but it seems both too liberal (in allowable innumerable absurd combinations) and too conservative (by fixing the combination principles, and the ingredients in the mix). An alternative grounding for possibility might be in the powers and dispositions of what exists, which would eliminate some of the absurdities, though new powers then seem impossible.

Mathematics can throw light on possibility, by giving precise values to **probability**. The probability of a single event is unlikely to be precise, but relative probabilities can be given with precision, once initial probabilities are assigned. We have to distinguish between the subjective and objective here. Gamblers are interested in probabilities based on what is known (subjective probability), whereas science focuses on objective likelihoods of events (statistical probability). A set of probabilities only counts as 'formal' if all the options (scored out of 100) add up to 100.

An interesting group of possibilities are those which we label as '**chance**' or '**luck**'. If I visit a random foreign city and just happen to meet my long-lost brother in the street, this seems almost impossible, even though the presence of each of us seems quite normal. The phenomenon seems to rest on human hopes, though, since we think of luck as playing no part in plate tectonics, but a huge part in who survives an earthquake.

A particularly tricky group of possibilities is the **conditionals** – possibilities that depend on other possibilities. If I say 'if it rains I'll get wet' ($r \rightarrow w$), is that statement true? If it is true, what is its truthmaker? Is the world full of hypothetical facts, as well as concrete facts? Logicians say that the sentence describes a situation identical to 'either it doesn't rain, or I get wet' ($\neg r \vee w$), which eliminates the arrow of implication, reducing it to two simple facts (plus 'not' and 'or'). But what does a failure to rain imply? In conversation that is irrelevant, but logic must supply an answer (which turns out to be 'everything!'). We can keep the logic, and say relevance is just in what is appropriate for the context (the 'implicature' of the statement), but other accounts use possible worlds, or explain the statement in terms of beliefs rather than truth. A conditional claim is not a full assertion, so maybe strict truth is irrelevant. The issue is difficult but important, because reality seems to contain a huge web of these conditional possibilities.

Some conditionals state the implications of actual facts ('if it is p...'), but others refer to imaginary facts ('if it were p...'). These are **counterfactuals** (or 'contrary to fact' or 'subjunctive' conditionals), which are a key part of our thinking, when we assess the future and possible actions. Clearly they have no truthmakers in the actual world, so it has become standard to explain them using possible worlds. A counterfactual ($A \square \rightarrow B$) holds if in 'nearby' worlds (those very like actuality) B seems to be true whenever A is. This matches what counterfactuals mean, but may not explain their truth, which may need a more psychological or scientific account.