

## Thought experiments.

Human beings love to tell stories and we tell them for all sorts of reasons. Thought experiments in philosophy are typically little stories told for a specific purpose and are often the way people first encounter some of the classic problems in philosophy. However, as is so often the case in philosophy, something that at first appears simple and straightforward turns out to be very puzzling.

The first puzzle concerns what is meant by 'thought experiment'. Are they really experiments or is the word 'experiment' being used metaphorically? And if they are not experiments then what are they? Which philosophical stories count as thought experiments and which count as something else?

A second puzzle is how any story that has been made up and may describe something that is quite impossible in real life can tell us anything about the world in which we live.

Thought experiments, whatever they are, are used in a number of different disciplines and this complicates matters even further.

The English phrase 'thought experiment' is a translation of the German word 'Gedankenexperiment'. It was first used to describe the kind of thought experiments performed by scientists and became particularly associated with Albert Einstein. However, the kind of mental activity it describes goes much further back. One scientific thought experiment that has been much discussed is the one where Galileo showed that, when dropped, things should fall at the same rate.



Find out the details of Galileo's thought experiment.



Although Galileo's thought experiment is primarily scientific it also has relevance to philosophy. This thought experiment can be used as evidence in the debate between rationalism and empiricism. Explain why this is so.

It is easy to see why Galileo's thought experiment might be considered as some kind of experiment similar to an ordinary experiment. In this particular case it might even be carried out as a physical experiment. That isn't as simple as it might first seem.



Why, in practice, is it difficult to carry out Galileo's experiment?

The experiment was beautifully demonstrated by the crew of Apollo 15 when they dropped a hammer and a feather on the moon.

## What is a 'thought experiment'?

Perhaps because of their origin in science and perhaps because the writer is primarily thinking of thought experiments in a scientific context some writers think that thought experiments mirror ordinary physical experiments very closely.

An experiment is a procedure for answering or raising a question about the relationship between variables by varying one (or more) of them and tracking any response by the other or others.

A thought experiment is an experiment that purports to achieve its result without benefit of execution.

Roy Sorensen: Thought Experiments

Others recognise that even if they are concentrating on scientifically orientated thought experiments they are not easy to classify:

Thought experiments are performed in the laboratory of the mind. Beyond that bit of metaphor it's hard to say just what they are. We recognize them when we see them: they are visualizable; they involve mental manipulations; they are not the mere consequence of a theory-based calculation; they are often (but not always) impossible to implement as real experiments either because we lack the relevant technology or because they are simply impossible in principle, as when frictionless planes or a universe devoid of all matter are involved. If we are ever lucky enough to come up with a sharp definition of thought experiment, it is likely to be at the end of a long investigation.

The Laboratory of the Mind: Thought Experiments in the Natural Sciences  
James Robert Brown

Some philosophical thought experiments do seem to have elements that, at first sight, make them similar to scientific thought experiments; others are quite different and it may be best to think of the word 'experiment' as a metaphor. It may be that in some cases the word 'experiment' is positively misleading.



Find out about Derek Parfit's teletransportation thought experiment.

List ways in which this thought experiment is similar to a scientific thought experiment and ways in which it differs.

Tamar Szabó Gendler has suggested that looking at a selection of key thought experiments shows they share the following structure:

1. An imaginary scenario is described .
2. An argument is offered which attempts to establish the correct evaluation of the scenario.
3. This evaluation of the imagined scenario is then taken to reveal something about cases beyond the scenario.

Taking these as the key features of thought experiments is helpful because they limit what can be called thought experiments. It is tempting to describe a thought experiment as simply thinking through a scenario but this would then include such things as asking 'What will happen if I catch the bus instead of the train?' or even trying out different ways of solving a maths problem. A definition that is so broad has little practical use.



Find out about Nozick's experience machine. Describe Nozick's thought experiment using the structure suggested by Gendler.



Find out about Plato' cave. Would you classify this story as a thought experiment? Give reasons for your answer.



Does it make any difference whether the scenario has been imagined or is a real event?



Is there any difference between a thought experiment and merely citing a possible counter example?

## Types of 'thought experiment'?

Writers have classified thought experiments in different ways. Brown, who is mainly thinking about scientific examples, distinguishes between thought experiments that help to show a theory is true and those that show a theory is false.

**Constructive** thought experiments may be

- **Direct**—these end up suggesting a new well thought out theory;
- **Conjectural**—where it is not possible to form a fully developed theory but instead some 'thought-experimental phenomenon' is established and it is necessary to come up with a hypothesis to explain that phenomenon.
- **Mediative**—which help people draw a conclusion from an existing theory. Brown says it 'might illustrate some otherwise highly counter-intuitive aspect of the theory thereby making it seem more palatable; or it may act like a diagram in a geometrical proof in that it helps us to understand the formal derivation and may even have been essential in discovering the formal proof.'

**Destructive** thought experiments are directed against a theory and may, for example,

- show that the theory is internally inconsistent, or
- show that the theory conflicts with other strongly held beliefs.



Think about Galileo's thought experiment concerning falling objects and Parfit's teleportation thought experiment. How would you classify these using Brown's categories?

Gendler takes a different approach and classifies thought experiments according to the type of knowledge or understanding that they help to establish. For each imaginary scenario it is possible to ask:

1. What would happen?
2. How, given (1), should we describe what would happen?
3. How, given (2), should we evaluate what would happen?

She calls 'the first type **factive** (concerning what we think the facts of a situation would be), the second **conceptual** (concerning what we take to be the proper application of concepts), the third **valuational** (concerning the proper moral or aesthetic response to a situation).'

As a very rough guide, thought experiments that prompt the first question are typically to do with **science**, those that prompt the second question to do with **metaphysics** and **epistemology**, and those that prompt the third question to do with **ethics** and **aesthetics**.



Consider the thought experiments you have already investigated and decide how well they match up with Gendler's three questions.

## How do thought experiments go wrong?

### 1. Scenarios that are impossible to imagine correctly.

This initially seems a strange criticism. If the scenario is an imaginary one then it is not obvious how it can be imagined incorrectly. One of the reasons philosophers use thought experiments is to draw attention to contradictions that haven't previously been recognised or to draw attention to the way two different notions have been confused. If a thought experiment is radically different to our normal experiences then we can be correspondingly less sure that it is free of such contradictions.

One reason might be is that **it isn't possible to get a clear idea of the imagined situation**. In criticizing Act Utilitarianism Robert Nozick asks us to imagine there are 'utility monsters'. Derek Parfit has argued that these 'utility monsters' are so different to our normal experience it isn't possible to imagine them correctly and as a result they cannot be used as evidence in the way Nozick intends.



Find out what Nozick's means by a 'utility monster'. Do you agree that it is not possible to understand them enough for them to be used in the way Nozick intends?

A second reason why it might be impossible to imagine a scenario correctly is because **the background conditions against which the scenario has to be assessed are not clear**. In her book *Real People: Personal Identity Without Thought Experiments* Kathleen Wilkes accepts that some thought experiments are legitimate. In particular, she does not criticize those thought experiments that ask people what they would do in situations 'that may be unlikely or exotic, but which might possibly occur'. Instead, she concentrates on those that clearly cannot occur.

There is a striking difference between thought experiments in science, and those in the philosophy of mind, or ethics ... The difference harks back to the fact that thought experiments are indeed experiments, in one central sense at least, and subject to many of the same constraints as normal ones. One vital constraint is this. The experimenter—any experimenter, in thought or in actuality—needs to give us the background conditions against which he sets his experiment. If he does not, the results of his experiment will be inconclusive. The reason for that is simple and obvious: experiments, typically, set out to show what difference some factor makes; in order to test this, other relevant conditions must be held constant, and the problematic factor juggled against that constant background. If several factors were all fluctuating, then we would not know which of them (or which combinations of them) to hold responsible for the outcome.

...Now these stable relevant conditions may be taken for granted, or they may be explicitly stated; but they cannot be left wholly amorphous...

Let us turn now to thought experiments in philosophy. Consider first Gyges' ring: before we can make sense of this thought experiment, several points press to be answered—there are relevant background conditions that need to be known before we can draw any conclusion(s) from the imagined phenomenon. We need more information than we yet have about this 'possible world'. For instance, is the owner of the ring to be intangible as well as invisible? That makes a substantial difference *to the issue at issue*: if he is not intangible, he might by mistake bump up against, and get arrested by, a policeman, or get his hand slammed shut in the till-drawer. Thus a potential criminal may yet have self-interested reasons for staying within the bounds of morality. Is there anything that would count as 'punishment' for an invisible and intangible agent? If so, what—and how unpleasant would it be? If you are both invisible and intangible, could prison walls hold you? And if they could not, could you hold a gun, or a caseful of banknotes? Again, would others know that one owned such a ring? If so, then there might be extra reasons for *remaining* moral: viz., that unsolved crimes might otherwise be ascribed to you. The point is that the purpose of the thought experiment cannot be met unless such questions are answered: they are deeply relevant. The background is inadequately described, and the results therefore inconclusive.



Some thought experiments suggest scenarios that are possible but extreme—killing one person to save many others, torturing somebody to make somebody else say where the bomb has been hidden. Do the extreme nature of these scenarios also alter the background conditions in some way? If so, how does this differ from the point that Wilkes was making above?

## 2. Scenarios that distract from what is really going on.

Philosophers have always trafficked in thought experiments, putatively conclusive arguments about what is possible, necessary, and impossible under various assumptions. The cases that philosophers have been able to make using these methods are notoriously inconclusive. What "stands to reason" or is "obvious" in various complex scenarios is quite often more an artifact of the bias and limitations of the philosopher's imagination than the dictate of genuine logical insight.

Daniel Dennett

"Artificial Life as Philosophy." *Artificial Life* 1, no. 3 (1994)

Daniel Dennet has drawn attention to the fact that many thought experiments are used in arguments that rely on making an appeal to intuition. As such they will have all the potential weakness of that strategy.

A popular strategy in philosophy is to construct a certain sort of thought experiment I call an *intuition pump* [...]. Such thought experiments [...] are not supposed to clothe strict arguments that prove conclusions from premises. Rather, their point is to entrain a family of imaginative reflections in the reader that ultimately yields not a formal conclusion but a dictate of "intuition". Intuition pumps are cunningly designed to focus the reader's attention on "the important" features, and to deflect the reader from bogging down in hard-to-follow details. There is nothing wrong with this in principle. Indeed one of philosophy's highest callings is finding ways of helping people see the forest and not just the trees. But intuition pumps are often abused, though seldom deliberately.

Daniel Dennett

*Elbow Room; The Varieties of Free Will Worth Wanting.*



There is a legal adage that says 'Hard cases make bad laws'. Find out what this means. Is there any way in which it might be relevant to the use of thought experiments?

### 3. Scenarios that are inappropriate to the point being made.

Some thought experiments are used as part of an analogical argument. A scenario is proposed that is expected to elicit a particular intuitive response. It is then suggested that the imagined scenario is relevantly similar to the main point being discussed and so a similar kind of response would be appropriated in that situation. For an analogical argument to work there have to be enough relevant similarities and no relevant dissimilarities. The more extreme or unusual the scenario the less likely it is that it will be an appropriate analogy.

A thought experiment introduced by Judith Jarvis Thomson in her paper "A Defense of Abortion" can be interpreted as an analogical argument:

You wake up in the morning and find yourself in bed with a famous unconscious violinist. He has a fatal kidney ailment, and the Society of Music Lovers has found that you alone have the right blood type to help. They have therefore kidnapped you, and the violinist's circulatory system was plugged into yours, so your kidneys can be used to extract poisons from his blood. The director of the hospital tells you, "Look, we're sorry the Society of Music Lovers did this to you—we would never have permitted it if we had known. But still, they did it, and the violinist now is plugged into you. To unplug you would be to kill him. But it's only for nine months. By then he will have recovered from his ailment, and can safely be unplugged from you." "Is it morally incumbent on you to accede to this situation? No doubt it would be very nice of you if you did, a great kindness. But do you have to accede to it?"



Explain how this thought experiment might work as part of an analogical argument. Make a list of the similarities and dissimilarities between the violinist scenario and the situation where a woman becomes pregnant through rape. Are any of the dissimilarities sufficient to undermine the argument?



Although the violinist scenario is the most widely discussed of Thomson's thought experiments, in her paper she has others—the rapidly growing child, the burglar, and the people seeds. Find out what each of these is trying to establish and assess whether they avoid the criticisms of thought experiments discussed above.