# Two Ways of Thinking

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### An abstract Overview

In Western philosophy deductive reasoning following the principles of logic is widely accepted as the way to analyze information. Perhaps the Turing machine, a theoretical model widely hailed as the forerunner of the digital computer, accurately describes this approach. Its success speaks for itself, but despite its successes, it also has significant limitations.

Analytic philosophy pursues deductive reasoning and, following Russell, continues to explore the application of logic to our human experience. To achieve this it needs clear identities and rigid relationships, but has found that these are elusive. It has also tried unsuccessfully to develop a completely logical language. These projects, embarked upon with enthusiasm, now languish as seemingly insurmountable difficulties present themselves. As it faces an ostensibly blank wall Western philosophers now wonder aloud, if they should retire from creative endeavors and devote their efforts to the analysis of whatever science places before them.

The pursuit of the analytical method can be seen as an attempt to achieve certainty through logical reasoning. In seeking certainty Western Philosophy follows a long tradition. Christian philosophers sought certainty in their spiritual beliefs; Descartes sought certainty and found it in, "I think therefore I am" and the branch of philosophy that became "science" continues to seek it in repeatability of experimental results. This quest for certainty has occupied Western thought for a very long time and has been a major contributor to the West's materialistic successes, but as indicated above, it has its limits.

While analytic philosophy focused on precision and detail, other branches of philosophy have concentrated on trying to understand the big issues. What is being? Is there a God? Was there a beginning? What faith should we adopt? These topics do not lend themselves to detailed analysis. A definition of "being" is elusive. God cannot be defined precisely. The concept of a beginning begs the question of what existed before it and from a Western perspective faith has developed a reputation for taking people down a path of irreconcilable conflict.

Analytical philosophy sought to avoid speculating on things that cannot be verified and so avoid endless inconclusive debate, but the inconclusive debate continues.

### Analyzing analysis

Analytical philosophy seeks to operate without faith, substituting logic and reason for this discredited emotion. Vague overviews, such as the above, induce concerns that

sometimes produce hostility from philosophers who see precision as the "way" of philosophy. Perhaps we should ask, what is the reason for the reliance on reason and precision?

Karl Popper, in "The Defense of Rationalism," argues as follows:

> But this means that whoever adopts the rationalist attitude does so because he has adopted, consciously or unconsciously, some proposal, or decision, or belief, or behaviour; an adoption which may be called 'irrational.' Whether this adoption is tentative or leads to a settled habit, we may describe it as an irrational faith in reason. (*Selections* 35)

Is this indeed the case? Surely the consistent results obtained with rational arguments indicate that rationalism is correct. This is not refuted, but the issue is not about being correct, it is about the rational basis of the result. Popper argues that all arguments have to "start" with assumptions. We cannot therefore be completely rational because our assumptions do not have a rational basis. If we seek to develop an argument to rationally support our assumptions, this argument will itself have to be based on assumptions.

An example can be drawn from the assumption apparent in defining logical variables as either true or false. This is a very creative step, but what reason can be offered for doing this? It may be argued that the assumption (that variables should be defined in this way) is self-evident. Such an argument is either circular or irrational. There is never any logical reason to take any such creative step; a leap of faith is required. We always have to start with assumptions. In the case of logic, we assume that it will be useful to define logical variables as either true or false and then proceed to test the hypothesis. The process is to (a) make assumptions and propose a hypothesis and then (b) test these by creating/simulating a world that contains them. If the hypothesis proves to be useful, it is retained.

There is a strong element of circularity here. If we define logical variables, impose these on the world and find that they are useful; can we conclude that the world is logical? Suppose, for example, we assume that the world is black and white and we then label everything we see as black or white and find that this is useful, is it then logical to conclude that the world is black and white? Cleary not. All we can conclude is that this method of analysis is useful. The circularity is apparent in that we have to start with an assumption about what we expect to find. We expected the world to be black and white; that is why we defined the variables in that way. Similarly, if we expect a logical world, define logical variables, find that this produces useful results and conclude that the world is logical we will have, circularly, imposed our assumptions on our conclusion.

It is apparent that the rational world in which analytic philosophy operates is a subset of a larger world. We live in this larger world and isolate a subset of this world that can be rationally analyzed. The assumptions inherent in the analytical approach define the limits of the smaller world we are to analyze, while the hypothesis produced by some non-rational process gives our analytical facilities something that it can test. This raises the

question, how do we go about the irrational process of making the assumptions that isolate the smaller world for analysis?

It is apparent that some other process is needed and thankfully we have causality and induction, two processes that are adapt at making assumptions and creating hypotheses.

**Causality and Induction**

There appear to be many causal relationships in the physical world. Because of this we induce that everything must have a cause. If we do not find a cause, we do not conclude that causality has failed; instead we conclude that we have not been diligent enough in our search for a cause. This indicates that, in addition to having an irrational faith in reason, we also have a similar faith in causality. Why is this?

Kant argued that we impose concepts like time and space on the world we observe in order to be able to understand it. From a more general perspective we can think of ourselves as having limited abilities to think and this forces us to take "short cuts" to be able to understand the information we get. Perhaps the "faiths" discussed above are a different description of these short cuts and a different way of referring to our assumptions.

Restak, in "The Secret Life of the Brain" suggests, "neurons that fire together, wire together." This is supported by research by Joseph LeDoux and many others indicating that our brain is structured in a way that creates associations between concurrent events. This is essentially what we do when we induce relationships between things. LeDoux also points out that we also have brain structures specialized in detecting movement and creating identities. This supports Kant in suggesting that we are not perfect observers. Essentially we see what we are capable of seeing and then each of us selects and manipulates the information we do collect to create our own personal version of the world that all of us sense. It also suggests that there may be features of the world that we don't know about because our sensory mechanisms are not adapted to detecting them.

In constructing a model based on these tenuous linkages, the attractive certainty of logic has to be forgone. None of the ideas outlined above can be deducted from the information available. These all has to be induced by associating likely events and building a theoretical model that can account for the observations we do have. There are probably thousands of models that can be built from the available facts. Popper has made it very clear that we can never be certain that our model or theory is correct. We can only continue to collect information and modify the model as appropriate.

The models we build can also have varying levels of detail. The highly abstract model described here may be suitable for some purposes, but a neuroscientist would want a much more detailed model for her work. At the extremely abstract level we find models constructed by various belief systems. Christianity has several versions of its main model as does the other major religions.

While there can be no certainty about the abstract models "explaining" the relationships that we observe, deductive reasoning can reject many of them. The test is simple: If the model does not account for all verified observations, then it is wrong and needs to be modified. While the test is easy, its application is difficult as we become emotionally attached to our favored model. A short exposure to religion demonstrates how creative speculation can bridge the gap between a favored model and observations.

**The Inductive – Analytic Model**

Operating in inductive mode we build a "possible world," incorporating assumptions and a theory or model and then use analysis to test this. This very process is being used to create the model being described here. It seems right to say that we have limited information processing abilities and live in an informationally rich world. Our sensors are continually receiving massive amounts of information and we do not have the resources to process all of this. Our analytical abilities are so restricted that we can only process a very simple set of information and must have the ability to select relevant information for processing.

It seems reasonable to suggest that in adapting to this environment, we have developed two modes of thinking. One that quickly processes large quantities of information to select a small set that is relevant for more detailed analysis and another, more fine grained process that sifts through the selected information. The first cycles of this process can occur very rapidly, but if a hypothesis or model is not accepted and the process continues an increasing number of relationships may be considered by the inductive process and the rational thinking required to dismiss an inductive suggestion may becomes more demanding. Both of these effects take more time and so slow the cycles.

A simple model of our thinking process could incorporate two modes. (a) an inductive phase where we use our "creative" inductive ability to develop a model and (b) an analytic phase in which the model is tested and often rejected. Cycles of these phases can occur very quickly. Think of "Induc" as representing the creative/inductive phase and "Logi" as representing the analytical phase and imagine the following conversation between them:

Induc: "There is something in the sky, it is getting closer, is it a bird?

Logi: "No – there are no flapping wings so it cannot be a bird."

Induc: " Is it a plane?"

Logi: "No it does not have wings."

Induc: " Is it Superman?"

Induc does no analysis, but is influenced by the analysis done by Logi. Logi simply analyses Induc's suggestion and rejects any that do not make analytical sense. Induc then uses this information to come up with another suggestion.

This mode of thinking can be applied to the process of identifying an object or trying to determine if God exists. It is very similar to the concept behind Darwin's selection of the fittest where various adaptations to the environment are tested and the unsuitable ones rejected. It also mirrors the scientific process.

While both phases of thinking are necessary, analytical philosophy has concentrated on analysis without paying much attention to how it arrives at the assumptions on which the analysis is based. Russell decided that he would work on a logical language and many followed his example, but why did he do this? What made him think that this would be a fruitful line of enquiry? The model suggested above indicates that there must have been be an inductive phase to this decision, but this is not highlighted in the discussions in analytic philosophy.

Perhaps this is because analytical philosophy must concentrate on analysis and cannot therefore discuss how Induc comes up with the suggestions it analyze as this leads to the circularity discussed above. It is therefore necessary for other branches of philosophy, using different skills, to investigate the assumptions that must precede analysis.

Analytical philosophy is clearly identified with the second phase of the cycle, while the first phase, the irrational phase, can be associated with the "facility" that Kant describes as a synthetic a priori linkage. This linkage that Kant identified as necessary may be identical with what Restack refers to as "neurons that fire together, wire together." When this happens ideas that have no logical relationship are connected by a "synthetic" nerve fiber creating Kant's "synthetic a priori" linkage.

**Applying this Model to Philosophy**

In the early days, the simple models created by our coarse grained inductive abilities seemed correct (God made the world etc.), but as our analytical abilities have improved these simple models have been rejected. In response a totally analytical model was proposed (by the analytical philosophical school), but as argued here, analysis also rejects this as it has very limited abilities.

During this process, we have learnt a lot about induction and analysis and perhaps it is now appropriate to recombine these into an inductive/analytical model of our thinking process. This would require a combination of the different approaches to philosophy with the aim of coming up with a better model of the human thinking process. This project also has the potential of create linkages between philosophers of different traditions.

Despite the difficulties, philosophers must continue to use their inductive facilities to create models and then rigorously test them with analysis. Perhaps this process can be

facilitated by turning the spotlight on ourselves and examining our abilities rather than keeping the spotlight focused on the external world.

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