# Contents

1 Summary ............................................ 2

2 Introduction ..................................... 3

3 The Turing Test .................................. 4  
  3.1 Descartes .................................... 4  
  3.2 Distinguishing between Man and Machine .... 5

4 The Chinese Room Experiment ................. 7  
  4.1 Experiment or Argument? ................. 7  
  4.2 The Chinese Room Experiment .......... 7

5 Replies to the Chinese Room Experiment ..... 9  
  5.1 Different Replies ......................... 9  
  5.2 The System Reply ......................... 9  
  5.3 The Robot Reply .......................... 10  
  5.4 The Brain Simulator Reply ............. 10  
  5.5 The Intuition Reply ...................... 11

6 The Chinese Room Argument .................. 12  
  6.1 A formal approach ....................... 12  
  6.2 The formal argument .................... 12  
  6.3 Inspecting the formal argument .......... 12  
  6.4 The End of All Things Formal? ........ 13

7 Commentary ...................................... 15
1 Summary

In the 1980s John Searle proposed a thought experiment that would prove that computers are unable to ever achieve the same mental states as human beings. This was based around the fact that computers only operated syntactically and couldn’t understand the semantics of a text. He modelled a room in which a person did atomic steps provided to him via rulebooks to interpret a set of Chinese questions and in such a way came up with the answers. The person doesn’t speak Chinese however and therefore naturally didn’t understand the text. This room portrayed the workings of a computer and this then proved a computer wasn’t able to understand semantics.

Many people countered his thought experiment on the basis that it was an unfair or incomplete portrayal. Searle, unsatisfied by the way the other philosophers only attacked details of his metaphor, constructed a more general formal approach to illustrate his argument. This formal argument still turned out to be indefinite though and left the world a mixed bag. Nowadays the people versus the Chinese Room Argument are on the winning hand however, as they claim Searle’s notion of understanding is flawed. A probable good way of constructing semantics through syntactic operations is by handling the semantics as grammatical constructs.
2 Introduction

Ever since the introduction of the first computer, since Babbage’s Analytical Engine even, people have wondered if an artificial mind can someday match or even supersede our own. Whether such a computer would be able to ascertain the same cognitive powers and ability to comprehend and subsequently tackle the most complex problems as we have. There are those who reckon that computers already have an advanced cognitive state which is similar to ours. That, in effect, the internal workings of a computer are really no different than that of our brain and we can thus project our own notion of ‘thinking’ onto the inanimate computer. This group is only small though, as a test devised to recognize Artificial Intelligence, called the Turing Test, has never been met. Therefore most others take the more pragmatic approach that, as of yet, computers aren’t able to think. Or at least, not nearly having an intelligence as advanced as that of humans.

However, this group is divided roughly into two opposing camps. The first one claims that, albeit certain that computers do not possess the same cognitive prowess as us humans yet, this will only be a matter of time. That computers definitely have the potential to reason like we do and perhaps even go so far as to be able to generate a genuine self-consciousness.

Then there’s the final camp, the one John R. Searle, Mills Professor of the Philosophy of Mind and Language at Berkeley University California, belongs to. They state that no, the computer isn’t able to think like humans, and will, in fact, never achieve that feat. In 1980 John Searle proposed a thought experiment dubbed ‘the Chinese Room Argument’ that would allegedly solve the debate once and for all. An experiment that simulated a computer, processed a problem and generated plausible solutions, and yet had no comprehension of the text itself whatsoever. Such an experiment would surely debunk the claims for Strong AI (i.e. computers can think), made by the first group. But is the argument valid, and if so, what does that imply? Or if not, what are the arguments against it? Time for a careful examination.
3 The Turing Test

Searle based his thought experiment on what until then was considered to be one of the major tests for recognizing intelligence, the Turing Test. So in order to fully comprehend the underlying motivations of the Chinese Room Argument, it is essential that one is aware of the basics of this test. Much has already been said about the Turing Test though, and a complete dissertation would probably digress from the main subject a great deal more than appropriate. Which is why this section will concentrate primarily on the essentials.

3.1 Descartes

But Alan Turing, in turn, based his test on the ideas of another man, so we'll have to travel back into just a little bit further in time. Descartes was born the 31st of March in La Haye, France. He studied law at the University of Poitiers, but never really practiced it, as he enrolled into the army of Prince Maurits of the Netherlands. On a trip to Germany he had a vision of a new mathematical and scientific system, which became the basis for his later work. He went to France for a couple of years, even witnessed Richelieu’s siege of Larochelle and wrote Rules for the Direction of the Mind. After this he moved back to the Netherlands where he wrote most of his important works.

The new scientific system he envisioned would be completely different from Aristotle’s teachings which until then still dominated the scientific world. He refrained from ever publishing his work The World, however, as around that time (1933) Galileo was imprisoned for his heretic heliocentrism. He took a more pragmatic approach towards his idea of epistemology and in the following years published Discourse on Method and Meditations on First Philosophy. These works are important for this story as they contained the fundamental idea for the Turing Test and refutation of that test which is the Chinese Room Experiment. What’s more, it resolves around the sentence for which Descartes nowadays, among the commonfolk at least, is most famous (of course he did even more groundbreaking work in the field of analytic geometry, but this is relatively unknown): 'Cogito ergo sum'.

'Cogito ergo sum', which translates to the more generally heard 'I think therefore I am', is best portrayed via the thought experiment Descartes himself used, known as the Wax Argument. Consider a piece of wax, your senses will inform you that it has certain characteristics. Texture, smell, shape, size, color, elasticity and so forth. But when you hold the piece of wax in the close vicinity of a flame, all of these characteristics suddenly change, however it is still wax! Even though the data from the senses inform you that all of the characteristics are different. So in order to properly grasp the nature of wax, one can not rely on his senses, but must use his mind.
That our senses can deceive us, has a significant implication on the assessment of what it is we actually know. If everything you see can deceive you, every bit of knowledge is doubtful. But through all this, Descartes found a single thing to be true. If your mind is deceived by its senses at least it is certain that there is a mind, otherwise it couldn’t have been deceived. So in order to have a distorted cognition, there would have to be some sort of cognitive ability in the first place. While Descartes doubted nearly everything, at least he couldn’t doubt the fact that he doubted.

In 1943 Cartesian philosophy was condemned at the University of Utrecht. At an invitation by the Swedish queen he moved to Stockholm in 1948 where he died two years later of pneumonia. After his death his works were placed on the Roman Catholic list of forbidden books.

3.2 Distinguishing between Man and Machine

Doubting the existence of the perceived world was a strong catalyst for the philosophy of solipsism. Solipsism revolves around the idea that as your own mind is the only certainty in the world, you might as well conclude that your mind is the only thing in the world. And that as a result the world we perceive is created inside your mind. Naturally the fact that our brain serves as an interpreter for the senses and thus creates our notion of the world anyway is another reason for this paradigm.

Solipsists are -quite rightly so- anxiously eyeballed by other philosophers, as it is a vision that’s neither provable, nor refutable. However one needn’t go so far as to embrace solipsism to at least embrace some of it’s arguments or conclusions. Most notably that we can only project intelligence. Solipsists would argue that other people are mere drones with no intelligence, but only act that way because we think it intelligent. In a way, this could also be attributed to realist views of the world (i.e. the outside world really exists). I know that I am intelligent, but just because somebody else acts like he is, doesn’t necessarily make him an intelligent being. Because of this it is in fact impossible to prove that somebody else has intelligence similar to mine.

Alan Turing cleverly used this argument in the construction of a test for artificial intelligence. He argued that as the only way to attribute intelligence to another being is via the way it acts or replies, the same would apply to artificial beings. In this manner a computer could, for all ascertainable purposes, be considered intelligent simply by reacting intelligently. Or at least, just as intelligent as the next person one meets.

To put this idea into words, or a test, Turing devised a setup that could adequately project intelligence to a computer. He proposed three different rooms, one with a human enquirer, one with another human being and one with a
computer. For the human enquirer at least there is no way of telling in which room there’s a computer or another human being. They do have some form of communication however, be it written mail or a computer network, with which the enquirer can ask questions to the two respondents. Now if there’s no way, by means of asking questions and getting replies, that the enquirer is able to tell which of the enquirees is the computer and which the human being (other than of course plainly guessing) one can safely say that the computer displayed the same amount of intelligence as the other person. And thus deduce that the computer, by the aforementioned intelligence attribution standard, is intelligent.
4 The Chinese Room Experiment

4.1 Experiment or Argument?

The appellative Chinese Room Argument actually comprises two similar ideas that have been brought forward by John Searle. The first one was introduced in an article in 1980 [1] and was the actual thought experiment the greater public has come to know as the Chinese Room Argument. But this thought experiment was informally stated and as a result prone to all kinds of objections and criticisms (which will be thoroughly addressed in Chapter 4) unrelated to the underlying idea. Therefore Searle reformulated his idea a few years later into a more general approach of formal deductive logic. This proof was actually more extensive and incorporated the idea of the thought experiment. In order to keep a clear distinction between the two, the thought experiment will therefore from now on be called the Chinese Room Experiment and the encompassing argument the Chinese Room Argument.

The Chinese Room Experiment and Chinese Room Argument, while in effect superimposed idea-wise, heralded such a distinct replay that the replies to the experiment will be handled before the argument.

4.2 The Chinese Room Experiment

4.2.1 Ni Hao, Shi-Jie

Picture a person sitting in a room. The room is utterly devoid of any objects, except for a pencil, a piece of paper and a comprehensive instruction manual on how to transform one character into another. For convenience purposes, one can also add a chair and a table to the picture for the person to work on. The room is closed on all sides but for a single slot with an attached tray on two opposing walls. One of these trays is labelled ‘Input’, the other ‘Output’. The person only speaks English, or any other language for that matter (for this example I will stick to a monolingual Englishman though), but definitely not Chinese.

Occasionally he, let’s call him Joe, will receive one or multiple sheets of paper in the input tray. These are given to him by a group of scientists of whom he has no knowledge, and no contact with. The papers are larded with Chinese symbols which, our average Joe being monolingual, are completely meaningless to him. Joe takes the sheets out of the box and, sitting at his table, starts converting them according to the manual. Chinese, being a complicated language with many different characters, this manual can take the form of an incredibly large library, but let’s assume Joe has enough spare time what with him being locked up anyway. Following the steps of the manual he painstakingly translates the Chinese characters step for step (or groupwise) into another language he is completely unfamiliar with, say binary.
As an example for such a translation, imagine he receives the Chinese words *Ni Hao, Shi-Jie!* (which, incidentally, read 'Hello, World', but Joe is of course oblivious to this). Joe opens his rule book(s) and starts encoding the text that was given to him. After some time of relentlessly following the rules that are dictated to him in the book and writing every step down, he reaches the result of:

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011011100110100100100000011010000110000101101111
01110011011010000110100100100000011010100110100101100101
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which, one might have guessed, reads 'Ni Hao, Shi-Jie' in ASCII code. But Joe, being unproficient in ASCII naturally has no clue what the end result means, just as he had no clue what the initial Chinese text meant. And there you have it, Joe translated an entire text in the same manner as a computer does, without comprehending a single word of the text.

The important factor here is 'incomprehension'. The example above was merely syntactic and everyone will agree that both a computer and a sentient being can do syntactic conversions, without the necessity for intelligence. But imagine the Chinese text would have been preceded by the Chinese sentence 'Can you translate the following into ASCII?'. Or, to make it a completely semantical proposition, have a Chinese question on whatsoever answered in Chinese (as was the original argument from Searle). Naturally Joe doesn’t understand the question, but finds the appropriate course of action in the manual nonetheless. This then, is the decisive difference between a computer and a human being. The first remains on a basic syntactical level, changing one symbol into the other, while the latter can relate actual meaning to the words. Searle now leaves the question whether it is actually possible to accurately answer questions via rules completely out of the question. Because, whether or not this is the case, the computer will never really understand the text and therefore will never get on par with man’s cognitive abilities.

### 4.2.2 Implication

As indicated in Chapter 2, *The Turing Test*, intelligence was derived when an inquirer was unable to distinguish between a computer and a human being. Searle, by this thought experiment, tries to show that even though the person which asks the questions might not know whether they have been answered by a computer or somebody who really comprehends the text, to us it is obvious he doesn’t! Turing based his argument on the Cartesian presumption that it is impossible to tell whether someone is intelligent anyhow and therefore the appearance would suffice. But in the Chinese Room model one can easily place himself in the center of the room and as such prove that he (being the computer) did not show intelligent behaviour. This effectively rejects the notion of an intelligent computer by Turing’s standard.
5  Replies to the Chinese Room Experiment

5.1  Different Replies

Searle’s thought experiment instantaneously caused a mass-stirrup. Among the rabble were other notable philosophers with the same expertise such as Jack Copeland, Daniel Dennett and Gdel Escher Bach’s Douglas Hofstadter. The replies to the Chinese Room Experiment could be summarised in three different categories, primarily by how much they concede to the argument.

The first group conceded that the man indeed did not understand Chinese, but find that a greater whole does. Searle indirectly infers that, as the person in the room doesn’t understand Chinese, nothing in the room does, which they hold as a non-sequitur. One example of this is the System Reply. The second group might concur with the fact that the way of processing a language in the model does not guarantee comprehension, but argue that a variation to this model would. Some of these variations are discussed in the Robot Reply and the Brain Simulator Reply. Finally, the third group finds the entire argument to be invalid on the basis of not explaining what comprehension is. Whether our notion of understanding is wrong (the Intuition Reply) or plainly insufficient to actually attribute it.

5.2  The System Reply

Among the first objections to the Chinese Room Experiment was the observation that the person doing the syntactic transitions only is a small part of the equation. This is commonly called the System Reply, as it identifies the person as being part of a greater system. In the case of a computer one could for instance call Joe the Central Processing Unit (CPU). A CPU in itself hardly has the ability to run a real program, or to do anything for that matter, but the combined efforts of the entire computer architecture do. This example projected back onto the Chinese Room argument, one could say that the paper Joe was using as notes during the transition, resembles memory. That the bookshelves with manuals comprised the entire set of computer software that does the translation and answering. So while the person inside the room might not understand what is going on, the combined set of everything in the room does.

To this Searle retorted that it is ridiculous that while the person doesn’t understand Chinese, he combined with bits of paper would. To further strengthen his argument he proposed that the person would memorise everything that’s inside the rulebook (imagine such a feat would be possible). Then, according to Searle, the person would still not understand the text he read. But this is a bit of a hazardous thing to simply claim. Not only is it doubtful because memorising every step could account for some sort of comprehension, the whole usage of a human being in the thought experiment could be considered ‘tricky’.
Humans have the ability to recognise connections and patterns in abstract character sets. Not in the least because the person recognises the Chinese characters as being a language. It’s not unthinkable therefore, that when certain patterns keep on emerging at different parts of the text, the person could relate it to known languages and at least comprehend small portions. Searle countered this by replacing the person with a well trained flee. If this flee would be trained in such a way that at the showing of a certain character it would hop accordingly, there would be no doubt whatsoever that the flee doesn’t understand Chinese.

5.3 The Robot Reply

Searle’s argument revolves around meaning. A computer can’t relate a semantic character to text because it isn’t able to attribute any meaning to the words. But how then do we relate meaning to words? If we read the word hamburger, what is it that we think of? We might think of the way it tastes, the way it looks or whether or not we prefer ketchup on top. Then again, if you’ve never seen or tasted a hamburger but heard of it, you could picture it on basis of what you’ve seen before or combine the taste of bread and meat to get an indication of what a hamburger is. If you’ve never heard about or tasted a hamburger, the word would mean the same to you as would to a computer: absolutely nothing. In order to make the thought experiment fairer Searle needs to therefore at least give the person in the model some sort of relation with the text to the outside world, in order to attribute meaning to the text. This is called the Robot Reply, as you substitute the computer for a robot with sensory input.

Searle was not impressed however and argued that the same experiment and idea would still apply, albeit slightly altered. Have a ticker tape or tv monitor in the corner of one room output some digits along with the text. Now the rules inside the rulebooks are changed in such a way that they need these numbers as input for their heuristics. Unbeknowst to the person (or robot) inside the room, these numbers correspond to the outside world in the same manner as would meaning to a word. The reason this input is in the form of seemingly meaningless numbers is because it is exactly what it would be to a computer. Meaning or no, a computer would still compute it syntactically, which is categorically different from semantics.

5.4 The Brain Simulator Reply

Perhaps the most original reply is the Brain Simulator Reply. It completely agrees with Searle that the proposed model is incapable of ever comprehending the Chinese text. This implies then that the chosen direction of automated language and grammar interpreting currently used in artificial intelligence is insufficient for ever creating real intelligence. But they don’t agree with Searle that this can be leveled to the general case that there is no way a computer will ever be able to reproduce intelligence.
They propose a different approach for textual analysis, which strongly simulates the working of our brain (hence the name). Instead of really analysing the text, suppose one exactly mimics the neurons firing the electricity and chemical fluids through the synapses, as would the brain of a Chinese speaking person do upon reading the text. There is no reason to assume the comprehension of a text would have some sort of otherworldly component other than what our brain does, so an exact simulation of the brain should logically do the same thing, i.e. interpret the text.

It’s hard to debunk such an argument, as we don’t know how the brain actually works. Searle does however believe in the mind being some sort of metaphysical essence, as is shown in his response. He gives another thought experiment where the person is controlling a nearly endless conglomeration of pipes and valves, exactly mimicking the brain. Steam runs through the pipes in the same manner as the electricity would through the brain while the person follows the rulebook to close and open the correct valves. Searle argues that we then have a machine that mimics the brain, but clearly doesn’t understand, as it doesn’t have a mind. He holds that simulation doesn’t necessarily mean reproduction.

5.5 The Intuition Reply

The third category of replies is the one which I hold to be the strongest denouncer of Searle’s thought experiment. Throughout his experiment, Searle showed that the atomically small, formal steps a computer takes is insufficient to create understanding. The main problem of this assertion is that Searle never tries to explain what understanding really is. And the most commonplace critique is that he has probably done this deliberately. It is unfair to juxtaposition hard atomic instructions on the one hand and some vague mental construct on the other. Naturally a single instruction doesn’t compare to.. what exactly?

The Intuition Reply argues that our (or at least Searle’s) intuitive idea of what a mind comprises might be wrong. One science fiction story tells of Aliens, physically unlike humans, that can’t believe humans can think with meat in their heads. The Aliens’ intuition is clearly flawed. Ours may be as well. Fact of the matter is, Searle can’t really prove that comprehension is something different than a series of atomic instructions, other than an intuitive feeling. One counterargument provided by Churchland and Churchland [Churchland, P. and Churchland, P., 1990, Could a machine think?, Scientific American, 262(1):32-37] is that waving a magnet and not producing light doesn’t refute Maxwell’s theory that light consists of electromagnetic waves. Some critics claim that speed is an important factor here as well. The waves have such a low frequency that we simply can’t see the light even though technically it’s there. The same could be said for the person in the Chinese room. He operates at such a slow speed that intuitively we wouldn’t call it understanding, while in fact it may be the case. We wouldn’t call people this slow at solving puzzles intelligent either.
6 The Chinese Room Argument

6.1 A formal approach

Searle got slightly frustrated over the commentary he received, as he found it greatly missed the point. Up until now most of the criticism (apart from the intuition reply, but that was a slight anachronism) had been focused on small details concerning the setup of the thought experiment. Even though this was only intended as a metaphor with which to visualise the grander idea. So in order to redirect the commentaries back to the point where it mattered, Searle tried to transform his argument into a more general, formal approach. The essence of which is based around the distinction I iterated earlier between syntactic and semantic operations.

6.2 The formal argument

The logical derivation Searle proposes is based on four postulates, from which we can ultimately deduce that the running of a program cannot cause mental phenomena. It goes as follows:

(A1) Programs are syntactical.
(A2) Minds have semantics.
(A3) Syntax by itself is neither sufficient for nor constitutive of semantics.

Therefore,
(C1) Programs by themselves are not minds.

(A4) Brains cause minds. From which you can “immediately derive, trivially” (Searle 1990)
(C2) Any other system capable of causing minds would have to have causal powers (at least) equivalent to those of brains.
(C3) Any artifact that produced mental phenomena, any artificial brain would have to be able to duplicate the specific causal powers of brains, and it could not do that just by running a formal program.
(C4) The way human brains actually produce mental phenomena cannot be solely by virtue of running a computer program.

6.3 Inspecting the formal argument

Upon closer inspection we find that the second conclusion (C2) actually seems to be a reiteration of assumption 4. It is, at least, the only assumption that touches the subject of causing minds. Naturally concluding something you just assumed is logically correct. It is also completely trivial and proves nothing. The problem is that this reiteration isn’t even absolutely correct. From the assumption ”brains cause minds” it isn’t clear whether this is due to the causal powers of the brain, as stated in conclusion 2. If this were to be the case, then still conclusion 2 doesn’t logically follow from assumption 4, as this doesn’t
necessarily mean that a brain would have to utilise all of its causal powers to cause a mind.

Conclusions 3 and 4 seem to be derived from combining conclusions 1 and 2, so therefore I will not discuss them here. They should be implied by the discussion of the other two conclusions. What remains then is the first part, up to and including conclusion number 1. Logically, this part seems to be correct. If we were, for example, to apply the following substitutions:

P := is a Program
F := is formal (syntactical)
S := has semantics
M := is a mind

We would get:

A1. \( P_x \rightarrow F_x \)
A2. \( M_x \rightarrow S_x \)
A3. \( \neg(F_x \vdash S_x) \)
C4. \( P_x \rightarrow \neg M_x \)

The inference would herald (simplified):

1. \( P_x \rightarrow F_x \) (A1)
2. \( F_x \rightarrow \neg S_x \) (A3)
3. \( M_x \rightarrow S_x \) (A2)
4. \( P_x \) (assumption)
5. \( F_x \) (modus ponens 4, 1)
6. \( \neg S_x \) (modus ponens 5, 2)
7. \( \neg F_x \) (modus tollens 6, 3)
8. \( \neg P_x \) (by contradiction 7, 5)

As can be seen from the derivation, given these assumptions a program would logically not be a mind. An intuitionist would naturally contest that modus tollens is a faux pas, in which case the deductive step 7 is logically unsound, but generally speaking we hold the derivation to be sound.

6.4 The End of All Things Formal?

Now if the Chinese Room Argument turns out to be sound, does that logically mean it is valid? Well, no. Searle has a good point, of course, but some of his premises are considered highly "iffy". At least one assumption is undisputed, "brains cause minds". But perhaps that’s more because Searle still doesn’t explain what a mind entails than because it is deemed absolutely true. The other two have been subject to debate however. While his first assumption 'programs are syntactical' is definitely the case when the program is written down, it is decidedly questionable whether this still holds when the program is being run. After all, the human body is in essence just an empty shell when it isn’t operating as well.
But that’s not all, arguably a grammar parsing program is only syntactic in setup, but the operations it adheres definitely have a semantic disposition. Searle’s main argument lies in that computers don’t have a sense of intentionality, i.e. purpose. But the subroutines that make up the program have been constructed with intentionality (of the programmer)! To put it in other words, the actions might be syntactic, the result is without a doubt semantic. This then makes assumption 3, *Syntax by itself is neither sufficient for nor constitutive of semantics* highly questionable to say the least. While it remains the case that syntax is insufficient, syntactic operations (and there we have the previous argument with running programs again) could supposedly do the trick. As Searle’s argument is basically setup around this point, the argument becomes increasingly weak.
7 Commentary

Everything relates back to the fact whether or not comprehension is possible with atomic syntactic instructions. As said, Searle maintains that this is impossible. He proposed a thought experiment that directly opposed syntactic operations to a vague form of understanding. Searle never tried (or dared) to explain what understanding (or a mind) is and his argument is therefore missing the crucial detail it needs to make it the killer argument he perceived.

However, the counterarguments to Searle’s Chinese Room Argument can hardly be called decisive or infallible either. They primarily opt for other deviations to the argument which might, probably, who knows, long shot, cause some kind of semantics. The only counterargument that couldn’t be directly refuted by Searle and which I called the strongest, is also by far the vaguest in its proposed solution. The Intuition Reply states that ‘maybe our intuition of understanding is false’. This could be the case and if it would be thus that syntactic operations suffice for semantics, then that would refute Searle’s argument completely. But saying that it just may be the case can hardly be called a satisfying answer. So the real question in this rebuke is just how one can encapsulate understanding in simple operations.

One solution I devised myself is that understanding in our brains is really no more than grammatical instructions. Nearly a century ago Wittgenstein and others already stressed the importance of language constructs in our notion of logic. But in understanding too this can be equally important. My ‘solution’ closely resembles the Robot Reply in that it introspects how we relate meaning to words. The word hamburger might have meaning if we relate other characteristics to it, which gives the impression as would our brain resemble a relational database. But imagine now that the word hamburger has no meaning for us whatsoever. In that case the single word hamburger could be considered valueless (for cognitive purposes that is).

Much like Immanuel Kant’s synthetic a posteriori you need to have certain attributes to the word in order to create understanding, or cognitive value. These are passed on in the sentence which carries the subject. For instance, while ‘hamburger’ is meaningless, the sentence ‘the juicy hamburger made me salivate’ does propagate meaning. Namely that the hamburger was juicy and I would have liked to eat it.

The key element is how we process this data, i.e. interpret and understand it. Naturally, the sentence consists of grammatical structures, a subject and a predicate. The predicate is then divided into verbs, adjectives, adverbs, articles

1Yes, technically this is more information than you can distillate out of the sentence alone, you’d have to connect salivating to the desire to eat. The proper attribution should be solely ‘made me salivate’.

15
etcetera. Picture our brain as the relational database I commented on earlier, with tables for every grammatical structure thinkable. For the sake of the argument, I’ll limit myself to the subject, verb and the subject completion (or predicate nominative) because the sentence can roughly be divided into these three. Then have these parts of the sentence stored into its appropriate table, but with a connection between the records.

Now there are two basal questions one can ask himself about the stored data which directly cause semantics. They are the following:

1. What is [the subject]?
2. What does [the subject] [verb]?

In this case the first question would derive to ‘What is the hamburger?’, which links to the adjective stored somewhere under ‘subject’ (normally this would of course be in the adjective table). The second question would infer ‘What does the hamburger make?’ (made of course, but that would be a faulty sentence) which should link to the subject completion data, namely ‘me salivate’. So here you have simple syntactical, because it only looks at grammar, operations that attributes meaning (and thus semantics) for us! Of course this is tied to the Intuitionist Reply, as it would turn our paradigm on understanding to a more mechanic view. But I stress that the idea is valid, for the simple fact that we cannot find other ways of understanding things other than basic questions we can ask ourself on subjects.

However this would imply that we have an intuitive notion of asking ourselves the basal questions mentioned above, incorporated in our cognitive mind. I postulate this without real explanation on the basis that the same applies for other cognitive functions such as the logical operators ‘and’ and ‘or’ which philosophers find are also instinctive to human beings. Either way, it is no problem for a programmer to implement the computer with the same basic steps.