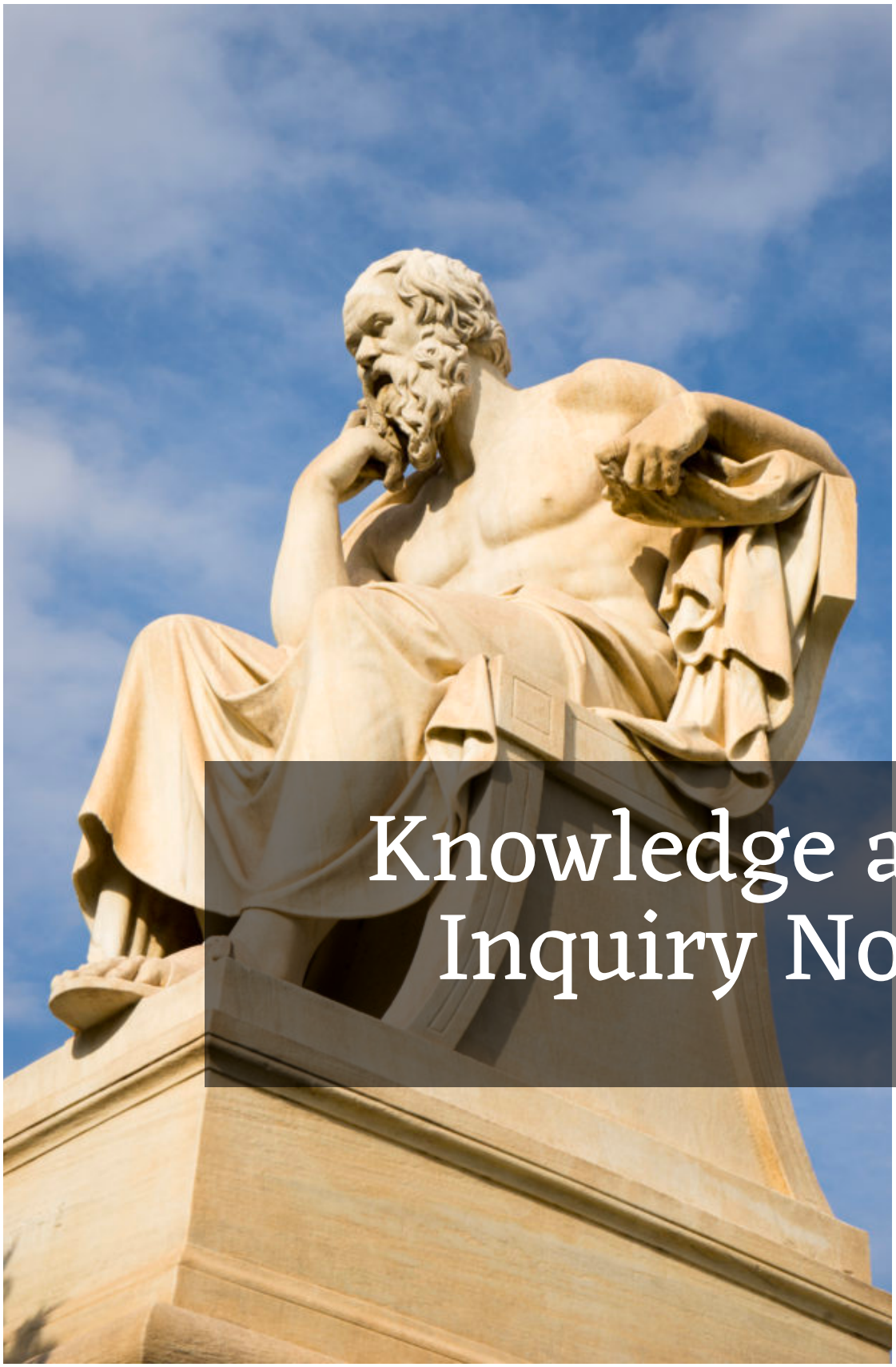


Knowledge and Inquiry Notes

LAU

2022/2023

RAFFLES INSTITUTION
KNOWLEDGE AND INQUIRY 2022

CHAPTER 1: CRITICAL THINKING

1 PARTS OF AN ARGUMENT

1.1 Definition of an Argument

An argument is a set of statements (or propositions) which functions to prove one of the statements as true on the basis of the other statements given.

1.2 Identifying Arguments

In order to identify an argument, one simple method is to look out for conclusion indicators. If there is no clear conclusion, there is no argument. If one of the sentences in the passage is a conclusion supported by a reason or reasons in the passage, then the passage is an argument.

1.2.1 Types of Non-Arguments

There exist a few kinds of non-arguments, most of which are easy to spot. These include:

(a) Expository passages that only elaborate the topic without argument.
(b) Illustrations that provide examples for understanding, without introducing new arguments.
(c) Simple non-inferential texts such as warnings or commands that do not claim that anything is being proved.

However, it is far more difficult to distinguish between explanation and argument. In an argument, the statements work together to establish a conclusion via reasoning. On the other hand, in an explanation, the statements provide clarity and specificity to the main claim. Hence, the conclusion is already assumed to be true by the author. When in doubt one can further turn to the following checklist to confirm that it is an argument:

(a) The passage can be fit into the form of "*P1, P2, P3 […] Therefore C*".
(b) The author intends to prove the truth value of *C*, using obligatory words like "should".

1.3 Premises and Conclusions

An argument is made from premises and conclusions. Premises are the building blocks of an argument, giving reason as to why the conclusion is true. Fundamentally, premises have to have a truth value, and is therefore a piece of propositional knowledge. On the other hand, a conclusion is the end point of an argument, and is the result of a chain of inference (based on the premises) which is supported by reasoning.

1.3.1 Premise and Conclusion Indicators

It is paramount that you correctly identify the premises and conclusion of an argument correctly; otherwise, you would not be able to evaluate it adequately. Hence, we can turn to indicators, which signal to us whether a statement is a premise or a conclusion. A non-exhaustive list of indicators can be found in Table 1 below.

Premise Indicators	Conclusion Indicators	Neither
As indicated by	Accordingly	Nevertheless
Because/As/For	As a result	However
For the reason that	Consequently	
Given that	Entails that	
In that	For this reason	
Owing to	Hence/So/Thus/Therefore	
Seeing that	Implies that	
Since	It follows that	

Table 1: List of Indicators by Type

1.4 Implicit Statements

In an argument, not all premises (and sometimes even conclusions) are made explicit. At times, they are kept implicit (as an enthymeme). This is usually done when the premises and conclusions are very obvious.

2 DEDUCTION AND INDUCTION

2.1 Principle of Charity

In philosophy (and most of the real world), arguments are made to discover and establish more about the world as we know it. Hence, when we evaluate arguments dialectically, we should apply the principle of charity. This means to try and construct as strong a position based on your understanding/interpretation or the information provided. Only when the argument is in its strongest form can it then be dismissed in a philosophically ethical manner.

Example: Consider someone saying that "If North Korea is developing nuclear weapons, North Korea is a threat to world peace." Under the principle of charity, we can assume that the author implies that North Korea is indeed developing nuclear weapons, and concludes that North Korea is a threat to world peace (Modus Ponens). In fact, this is probably what the author is intending — no one just randomly utters a singular conditional statement in isolation. Based on this understanding of the argument, we can then proceed to evaluate it.

2.2 Definitions of Deductive and Inductive Arguments

A deductive argument is an argument where the conclusion necessarily follows from the premises. On the other hand, an inductive argument is an argument where the conclusion probably follows from the premises. An alternative way of seeing it is that for a deductive argument, if the premises are true the conclusion must be true, while for an inductive argument if the premises are true the conclusion is only likely to be true. There is a probability at play in inductive reasoning which is not present in deductive argument.

2.2.1 Examples of Deductive Arguments

Some examples of deductive arguments include arguments grounded in mathematics and logic, or can be an argument from definition.

2.2.2 Examples of Inductive Arguments

In an inductive argument, the conclusion moves beyond 'just' the premises. This includes predictions about the future, causal inferences and generalisations of the world. Most scientific discoveries are considered to be reached inductively, as just because something has been the case for all of humanity does not mean that it will not change in the future.

2.3 Differentiating between Deductive and Inductive Arguments

The distinction between a deductive and an inductive argument lies in the strength of the argument's inferential claim. Therefore, we can evaluate the strength of the inferential claim in a few ways.

2.3.1 Indicator Words

Perhaps the easiest way of telling between the two types of arguments is to look at the strength of certain indicator words, a list of which can be found in Table 2.

Inductive Indicators	Deductive Indicators	Neither/Both
Probably Plausibly Likely Reasonable to conclude	Certainly Absolutely Definitely Necessarily	It must be the case

Table 2: List of Argument Type Indicators

2.3.2 Style of Argumentation

In a deductive argument, arguments typically move from general rules to a specific case (within the boundaries of said rules), while inductive arguments tend to generalise from specific instances to specific rules.

3 EVALUATING DEDUCTIVE ARGUMENTS

A good deductive argument will only be accepted if it fulfils the following conditions:

(a) It is a valid argument.
(b) It is a sound argument.
(c) It is not a circular argument.

3.1 Deductive Validity

When an argument is valid, it would be impossible for all the premises of the argument to be true, but the conclusion false. Hence, to check if the argument is valid, assume that the premises are true, and check if the conclusion can be conceivably false.

3.2 Deductive Soundness

A sound argument is a valid argument where all its premises are true. Hence, to evaluate the soundness of an argument, first check its validity, followed by checking the truth value of the premises.

3.3 Circular Arguments

Finally, we need to check if an argument is circular, as these arguments would not be accepted. A circular argument is an argument where the conclusion is presupposed in the premises (and hence argues in a circle).

3.4 Basic Forms of Deductive Arguments

There are some basic argument forms that are valid. Remembering them is useful, and they can be found in Table 3.

Modus Ponens	Modus Tollens	Hypothetical Syllogism
If P then Q. *P.* *Therefore Q.*	*If P then Q.* *Not Q.* *Therefore not P.*	*If P then Q.* *If Q then R.* *Therefore if P then R.*
Disjunctive Syllogism	**Barbara**	**Celarent**
Either P or Q. *Not P.* *Therefore Q.*	*All P are Q.* *All R are P.* *Therefore all R are Q.*	*No P are Q.* *All R are P.* *Therefore no R are Q.*
Darii	**Ferio**	**Dilemma**
All P are Q.	*No P are Q.*	*Either P or Q.*

Some R are P. *Therefore some R are Q.*	*Some R are P.* *Therefore some R are not Q.*	*If P then R.* *If Q then S.* *Either R or S.*

Table 3: List of Basic Deductive Argument Forms

4 EVALUATING INDUCTIVE ARGUMENTS

A good inductive argument will only be accepted if it fulfils the following conditions:

(a) It is a strong argument.
(b) It is a cogent argument.
(c) It is a reliable argument.

4.1 Inductive Strength

If an inductive argument is strong, then it is improbable that the conclusion is false given that the premises are true. On the other hand, if it is improbable that the conclusion is true given that the premises are true, then it is a weak inductive argument. The threshold of 'improbable' is usually held at 50%. As a side note, there seems to be little difference between an invalid deductive argument and a weak inductive argument. In the former, you challenge the strength of the conditional premise, while in the latter you challenge the likelihood of the conclusion being true.

4.2 Inductive Cogency

A cogent argument is a strong inductive argument where all its premises are true. Hence, to evaluate the cogency of an argument, first check its inductive strength, followed by checking the truth value of the premises.

4.3 Inductive Reliability

A reliable inductive argument is a cogent argument that does not ignore important pieces of evidence that entail a different solution (i.e. all known relevant information is accounted for). The condition that important facts must not be overlooked is known as the Total Evidence Requirement.

4.4 Basic Forms of Inductive Arguments

4.4.1 Argument from Analogy

The use of analogy in reasoning is common in all rational processes. For instance, when a person decides to study KI because he heard from seniors that they enjoyed KI, he is applying an argument from analogy. Broadly, an argument from analogy takes the following form:

(i) *Entity A has attributes a, b, c […] y and z.*
(ii) *Entity B has attributes a, b, c […] and y.*
(iii) *Therefore entity B has attribute z.*

Analogical reasoning depends on the similarity of circumstances. The more attributes that the two situations have in common, the more likely it is that the projected attribute will be shared between both entities. In addition, these attributes have to be meaningfully related (either systematically or causally) to the projected attribute, otherwise the generalisation is likely to be weak.

4.4.2 Inductive Generalisation

An inductive argument is of the form:

(i) *N% of a sample S (taken from population P) is Q.*

(ii) *Therefore N% of P is Q.*

For it to be cogent, the sample size has to be sufficiently large and representative of the population (ideally randomly selected).

4.4.3 Statistical Syllogism

A statistical syllogism has the form:

(i) *N% of P is Q.*
(ii) *R is P.*
(iii) *Therefore R is Q.*

For it to be a cogent argument, the probability/distribution has to be sufficiently high (typically >50%).

4.4.4 Argument from Authority

An argument from authority is an argument that bases its argumentative force on the source being an authority in a given field. For it to be a strong argument, the authority has to be an authority in the given field. Otherwise, it is a fallacy. These arguments typically come of the form:

(i) *Authority A claims X.*
(ii) *Therefore X is true.*

5 FALLACIES

A fallacy is a type of incorrect argument that may seem to be correct, but proves on closer examination to be completely wrong. These are typical errors made in argument logic.

5.1 Formal Fallacies

Formal fallacies are arguments which have a flaw in logic which can be easily shown in formal logic notation. It is therefore an invalid deductive argument. A list of formal fallacies can be found in Table 4 below.

Denying the Antecedent	Affirming the Consequent	Illicit Commutativity
If P then Q. *Not P.* *Therefore not Q.*	*If P then Q.* *Q.* *Therefore P.*	*If P then Q.* *Therefore if Q then P.*

Table 4: List of Basic Deductive Argument Forms

5.2 Informal Fallacies

Informal fallacies are fallacies in natural language. While many are known to exist, these are some of the more useful ones to remember.

Ad Baculum (Appeal to force)	Using direct or insinuated threats to bring about the acceptance of a certain conclusion.
Ad Hominem	Responding to an argument not by dealing with the content of the argument but by attacking the person or some aspect of the person who is making the argument.
Ad Ignorantium (Appeal to ignorance)	Establishing the truth of a claim solely based on the fact that there is no evidence against it.
Ad Lapidem	Dismissing a claim as absurd without demonstrating proof for its absurdity.

(Appeal to the stone)	
Ad Misericordiam (Appeal to pity)	Using pity to try and support an argument.
Ad Populum (Bandwagon)	Establishing the truth of a claim solely based on its popularity and familiarity.
Ad Verecundiam (Appeal to authority)	Using the judgement of individuals who have no legitimate claim to authority on the subject matter to prove a conclusion.
Amphiboly	When one of the statements in an argument can have two plausible meanings. This leads to ambiguity when trying to understand the argument. Example: Consider the argument "Nothing is better than wine. Sandwiches are better than nothing. Thus, sandwiches are better than wine." The first statement can be interpreted as both "Wine is the best thing there is" and "Empty space is better than wine".
Composition	The whole is assumed to have the properties of its constituent parts.
Division	The parts of a whole is assumed to have the properties of the whole.
Equivocation	When one of the words in an argument change meaning without it being explicitly pointed out.
False Attribution	Using fabricated or biased evidence to support a point. This includes quoting out of context.
False Dilemma	Presenting a limited set of alternatives when there are others that are worth considering in the context.
Gambler's Fallacy	Assuming that typically independent statistics are interdependent.
Loaded Question	A question which presupposes a premise within, so that regardless of how a person (rationally) responds to the question, they will inevitably commit to the claim loaded within.
McNamara Fallacy	Making an argument solely based on quantifiable observations and discounting qualitative information.
Petito Principii	Circular argument/begging the question.
Post Hoc, Ergo Propter Hoc	Assuming correlation is causation. Treating something which happened after an action to be the effect of said action.
Red Herring	Raising an irrelevant issue in argument which diverts attention from the main subject.
Slippery Slope	Arguing that if an opponent were to accept some claim *P*, then he or she has to accept some other closely related claim *Q*, which in turn commits the opponent to a still further claim *R*, eventually lezading to the conclusion that the opponent is committed to something absurd or obviously unacceptable.
Strawman	Assigning someone an implausible/unrepresentative position which one then proceeds to attack and take down rather easily.
Suppressed Evidence	When there is contradicting evidence, only showing evidence that supports one's position.

Table 5: List of Selected Informal Fallacies

6 EXAM SKILLS

6.1 Format

Candidates are tested on 3 papers. Papers 1 and 2 are written examinations taken during the end of year examinations — Paper 1 comprises 2 essays (from a choice of 6) on epistemology and inquiry in various fields, while Paper 2 requires candidates to evaluate passages of various origin.

Paper 3 takes the form of an Independent Study on a topic of the candidate's choice.

6.2 Knowledge and Inquiry as a Subject

Personally, Knowledge and Inquiry is slightly different from other subjects in two ways: (i) there is no fixed scope or syllabus per se (ii) the focus is placed on being able to think and understand various arguments. Being able to regurgitate the words of famous philosophers such as Kant or Hume will not give you a high score if you cannot make it seem relevant to the argument that you are making in the essay/long passage. Instead, being able to craft a strong argument that actually answers the question (even if this means that you have little opportunity to reference famous philosophers) will be more fruitful.

But this does not mean that the works of these philosophers are completely useless. Instead of simply using these philosophers, it makes more sense to consider what *you* think about these arguments that philosophers raise, and what *your* stand is on many of these big philosophical issues. This way, learning becomes more meaningful for yourself, and in some ways, it is actually easier — arguing for positions you find intuitive and believe in is definitely easier than the converse.

Ultimately, you will realise that all you explore in KI boils down to a few questions ("What is knowledge?", "What is the nature of knowledge in X field?" etc.). Always keep these questions in mind, and attempt to answer them the best you can at every opportunity; it is answering such questions which gives you scores that you presumably want.

6.3 Reconstructing Arguments

In Paper 2, you will have to reconstruct arguments before you can respond to them properly. When reconstructing arguments, always begin by stating the main conclusion of the argument. The conclusion is usually explicit, but is possible to be implicit. The key is to ensure that the conclusion is derived from majority of the premises in the passage; if not, there is a high likelihood that the wrong conclusion was identified.

Proceeding this, state the key logic of the argument, making clear the tiers of premises and sub-conclusions (use premise and conclusion indicators!). At the same time, there is a need to show how these premises relate to the final conclusion. If there are any assumptions made in the passage, pointing them out here will be useful. A good response will also reference how the author makes his case — for instance through the reference of statistics, or the inclusion of red-herrings.

Ideally, the argument reconstruction is 4-5 lines long.

Basic reconstruction template:
"*The author argues that… This is because… Furthermore/Moreover… In arguing for this stance the author assumes that…"*

6.4 Evaluating Arguments

There are three main ways to evaluate an argument:

(a) Evaluating the form of the argument.
(b) Evaluating the truth of the premises.
(c) Evaluating the link between premises and sub-conclusions.

When evaluating the argument, first signpost the premise/assumption that you are responding to. Proceeding this, state your own point (be it agree or disagree) and substantiate it. Most importantly,

after you have finished explaining your point, you need to then show the implications of your evaluative comments — even if you take down a premise/link, the conclusion can still stand. A necessary implication of this is that you can disagree with a certain premise, but at the end of the day still accept the main conclusion of the argument.

Some other common forms of evaluation include:

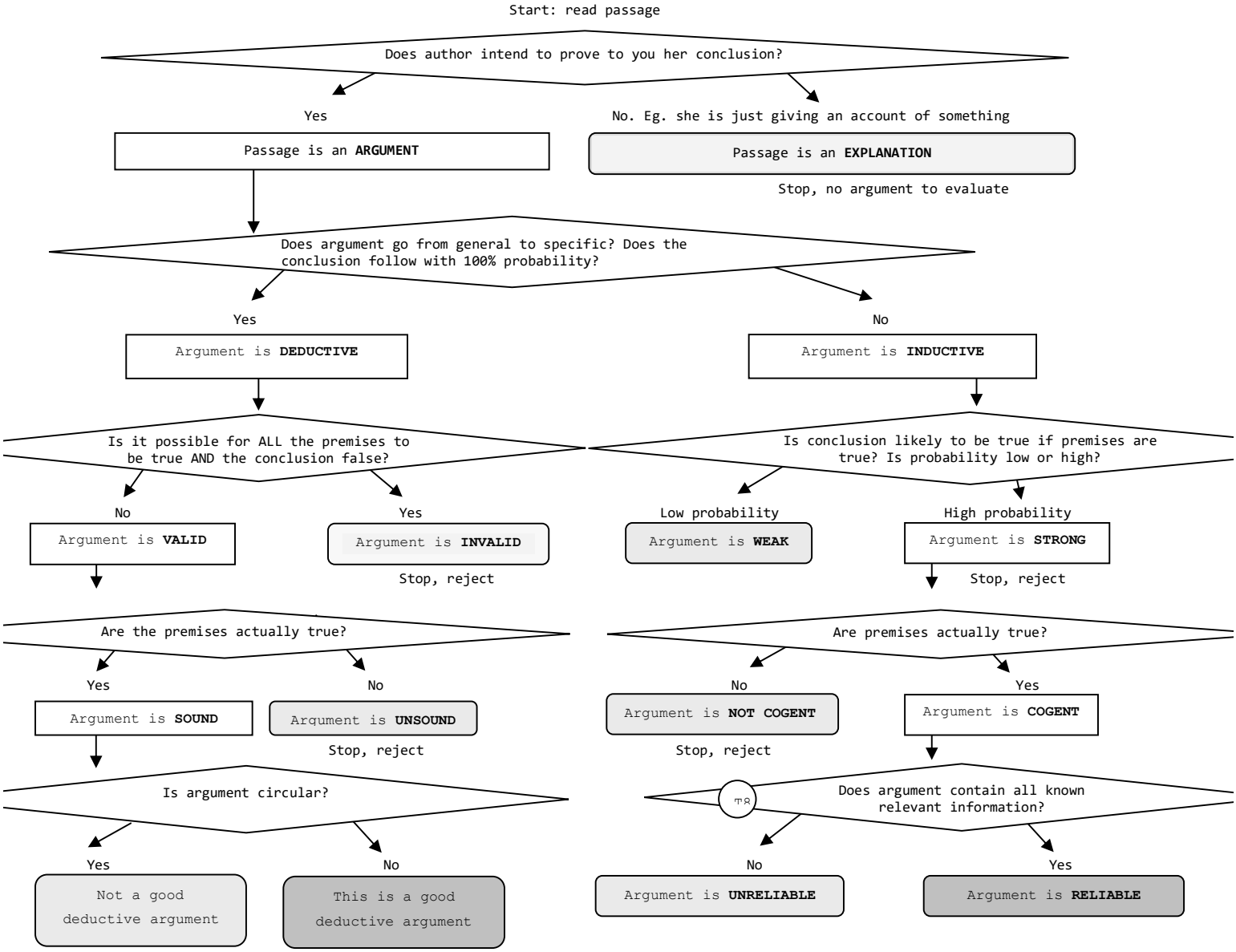
(a) *Lacking clarity:* If an argument uses several terms but fails to distinguish them appropriately (e.g. what is "too little" vs "too much"), then this could impact the conclusion that the author makes (e.g. that "moderation" is the best — but what exactly is this?).
(b) *Lacking comparative:* If an argument engages in a cost-benefit analysis, but fails to weigh properly (e.g. not having any negatives, or simply asserting that the costs are outweighed by the benefits), then this is a poor argument.
(c) *Problems with analogy:* If the argument uses an analogy to arrive at its conclusion, but the analogy is a poor one, then the conclusion is put into question.

When concluding, state how your comments collectively affect your take on the author's conclusion. This is the most important part of evaluation, as without it, you are not actually responding to the question at hand. When in time-trouble prioritise writing the conclusion (and completing the argument) over evaluating the points raised within the argument.

6.4.1 A Note on Nit-picking

When evaluating arguments, it is normal to tunnel on minute details of the short passage. This classifies as nit-picking, and it is unwise to argue in such a manner as it does not assume the Principle of Charity (and honestly, there are better things to write about). As a rule-of-thumb, do not challenge the legitimacy of statistics, and do not spend significant efforts on small linguistic nuances of the argument.

APPENDIX A: CRITICAL THINKING FLOWCHART



RAFFLES INSTITUTION
KNOWLEDGE AND INQUIRY 2022

CHAPTER 2: EPISTEMOLOGY

1 INTRODUCTION TO KNOWLEDGE

Epistemology is the study of the nature, origin, and limits of human knowledge. In order to reach a conclusion on these kinds of knowledge, however, it is important to first define what knowledge exactly is. Only when we have a good definition of knowledge can we then examine its nature.

1.1 Types of Knowledge

Traditionally, philosophers have attempted to split knowledge into distinct categories. Some popular ones are:

(a) Practical knowledge.
(b) Knowledge by acquaintance.
(c) Factual knowledge.

1.1.1 Practical Knowledge

As the name suggests, practical knowledge is knowledge of how to do something. Some examples include how to rock-climb or swim. One important characteristic of such knowledge is that it is possible to have the capacity to perform an action, but not be explicitly aware of it or be able to communicate it in language.

1.1.2 Knowledge by Acquaintance

When we know something by experience, it is considered to be knowledge by acquaintance. As with practical knowledge, it is possible to know something gained by acquaintance (e.g. knowledge of a taste/person) without being able to describe it.

1.1.3 Factual/Propositional Knowledge

Finally, factual knowledge is knowledge that something is the case. These are propositional statements such as “The Earth is round”. In order to know something in this manner, it has to be able to be communicated through language — that is how you prove that you know something. In Knowledge and Inquiry, we are primarily focused with this kind of knowledge.

1.2 Working Definition

Knowledge is defined as a justified true belief. These three conditions are individually necessary and collectively sufficient. Hence, it can be said that a subject *S* knows a proposition *P* if and only if:

(a) *P* is true.
(b) *S* believes that *P*.
(c) *S* is justified in believing that *P*.

1.2.1 Belief as a Condition for Knowledge

It is commonly accepted that you can only know what you believe in. If you do not even believe anything that you claim, then it cannot be considered as knowledge. This seems to be trivial: If one does not even accept the claim that the Earth is round, then there is no point of even discussing whether or not it constitutes knowledge — one cannot know about things that you do not even accept in the first place. Moore’s paradox also highlights how belief is required for us to even claim something in the first place. Statements of the form “p & ¬Bp” or “p & B ¬p” (e.g. “It is raining but I do not believe that it is raining”) seem to be contradictory and problematic, even if there is no obvious contradiction being made. The reason why the claims appear absurd is because in claiming p, one implicitly claims that they believe p; if they did not then they would not claim p in the first place.

Some philosophers argue that knowledge is possible without belief. Example: A candidate provides the correct answer to a test, even though he seemingly guessed the answer. In this case, he does not believe in his answer (he guessed it), yet he got the correct answer, suggesting that there is knowledge. A counter to this argument is that he does in fact have a tacit belief in the answer (and hence he 'guessed' it as the answer), even if he does not think so. Second, it is possible to dismiss these circumstances as examples of knowledge, as if it was a truly random guess for instance, the justification condition would not be fulfilled.

1.2.2 Truth as a Condition for Knowledge

Rather intuitively, if something is factually untrue, it cannot ever be known. This is why we consider the flat-earthers to not have known that the Earth is flat (even if this fulfils any other condition for knowledge). However, the problem with making truth a condition for knowledge is that it is difficult for us to assess what truth really is, or whether truth really exists. Even if this is a metaphysical concept, it would be useful for us to try and understand the nature of truth so that we can claim that we know some things about the world.

Nonetheless, truth is a necessary condition for knowledge because the way we understand knowledge is closely related to truth. When we believe something, what we mean is that we typically believe it to be true. Truth also serves as an ideal for us to strive towards in the name of epistemic progress; if we were satisfied with false beliefs then we would not endeavour to perform inquiry. Finally, truth is important because it ensures that our knowledge actually is useful in the real-world, since when a belief is truer, it is more likely to lead to accurate predictions and explanations.

1.2.3 Justification as a Condition for Knowledge

Knowledge cannot just be comprised of true beliefs — if I merely guessed that the Earth orbits the Sun, we would not consider this to be knowledge. The difference here is justification, which essentially is that I need *good reasons* to believe in a belief. This is powerful insofar as it is able to guard against epistemic luck (i.e. situations where we stumble onto true beliefs by chance), and provides us with the ability to use true beliefs with confidence.

2 CHALLENGES TO KNOWLEDGE

2.1 The Gettier Problem

In his seminal paper titled "Is Justified True Belief Knowledge?" (refer to Appendix A), Edmund Gettier noted several examples of beliefs that are true and justified, but are not intuitively known of knowledge. Example: Someone looks at a clock on the wall, and concludes that it is noon. Unbeknownst to that person, the clock actually is not working, and has stopped. However, in reality it is coincidentally noon. Despite the subject having a justified true belief, we intuitively do not say that he has knowledge of the time.

A consequence of the Gettier Problem is that the three conditions for knowledge stated above are shown to not be jointly sufficient in accounting for knowledge — there are instances of non-knowledge which JTB considers as knowledge.

2.2 Responses to the Gettier Problem

Rather obviously, Gettier's paper caused a flurry of responses in order to defend knowledge. Broadly, these responses fall into the following categories:

(a) Providing a fourth condition of knowledge (JTB-X).
(b) Strengthening the justification condition of knowledge.

2.2.1 Additional Conditions of Knowledge

Perhaps the most common direction that one might take to deal with Gettier Problems is to add a fourth condition which excludes Gettier Problems. Many conditions have been proposed; here we shall discuss some of the more poignant ones.

Lehrer and Paxson suggested adding a defeasibility condition to the JTB understanding of knowledge. They suggest that if there is the possibility of new information that would count against the justification at hand, then the true belief cannot be considered as knowledge. By their logic, the example in *§2.1* would not constitute knowledge as the truth that the clock was not working that day would have defeated the justification for his belief. However, such an analysis of knowledge would inevitably rule out all forms of inductive knowledge, as there is always the possibility that new information can arise and defeat such inductive arguments.

Similarly, it is also postulated that adding a fourth condition of no false lemmas would fix the JTB framework. They claim that the Gettier Cases create a justified true belief by inference from a justified false belief, and hence any belief that is inferred from falsehood cannot be knowledge. However, this condition fails to account for Gettier Cases that do not rely on inferences to make (such as Russell's stopped clock case). Even so, the no false lemmas approach is very limiting on what can be constituted as knowledge. For instance, the below argument, although intuitively considered as knowledge, is denied under this approach:

(i) *Bob has never lied to me.* (Justified False Belief)
(ii) *Because Bob told me true P, I know P.* (Justified True Belief)

There are also several other conditions that attempt to resolve Gettier Cases, to varying levels of success. See Nozick's truth-tracking and sensitivity analysis, virtue-epistemological approaches to the problem, not allowing for epistemic luck etc.

2.2.2 Qualifying Justification

Broadly speaking, Zagzebski asserts that all forms of JTB-X analyses of knowledge are susceptible to counterexamples. This is because a simple way of generating Gettier Problems would be to start with a justified false belief, and then make the belief true by luck. Under such a circumstance, it would be easy for one to construct a counterexample in a similar fashion; first coming up with a justified false belief *that also fulfils X*, and then making it true.

One way of overcoming this argument would be to strengthen the justification claim under such Gettier Cases, implying that the Gettier Cases are not examples of justified true belief. Justification can be considered to be a matter of degrees, where something can be partially justified and more/less justified. Hence, even in such cases where there is justification, the level of justification is too low for it to be admissible as knowledge. However, this regresses to an attempt to find out the level of justification required for knowledge, which is not a definite, definable quantity. Alternatively, one can define justification as requiring truth, in which it would be impossible for a justified false belief to arise by Zagzebski's construction of Gettier Problems. However, this is an impossibly high bar for most forms of knowledge, since our senses are vulnerable to error, testimony could be potentially unreliable etc.

2.2.3 Contesting Gettier Problems

A final group of people (although this group is relatively small due to the sheer number of Gettier Cases) would deny that Gettier Cases constitute knowledge in the first place. From this, there would be no problem to the definition of knowledge. For example, some would argue that these definitions are far too detached from reality, and thus are not realistic ideas of knowledge that we should consider.

A more reasonable position to take is that even though these Gettier Problems exist, they only affect our understanding of knowledge in small ways, since they are so unlikely to happen. Given this, it might not be productive to consider these fringe cases. However, even this seems to be dismissive of the importance of completely understanding and defining knowledge — just because something is improbable or rare does not mean that it is not worthy of consideration to deepen our understanding in epistemology.

2.3 Scepticism

Ostensibly, the Gettier Problem remains a complex, unsolved problem. If we are to accept the working definition of knowledge in outlined in *§1.2*, we must acknowledge some form of uncertainty when it comes to knowledge. That is to say, just because something has a reasonably good justification might not mean that it constitutes knowledge. This is because some of the ways that we gain knowledge fundamentally increases the range of knowledge at the cost of uncertainty (Example: common sense). If we desire certainty in justification (one escape to the Gettier Problem outlined above), however, then it would be useful to consider the approaches of philosophical scepticism, in order to question our understanding of knowledge.

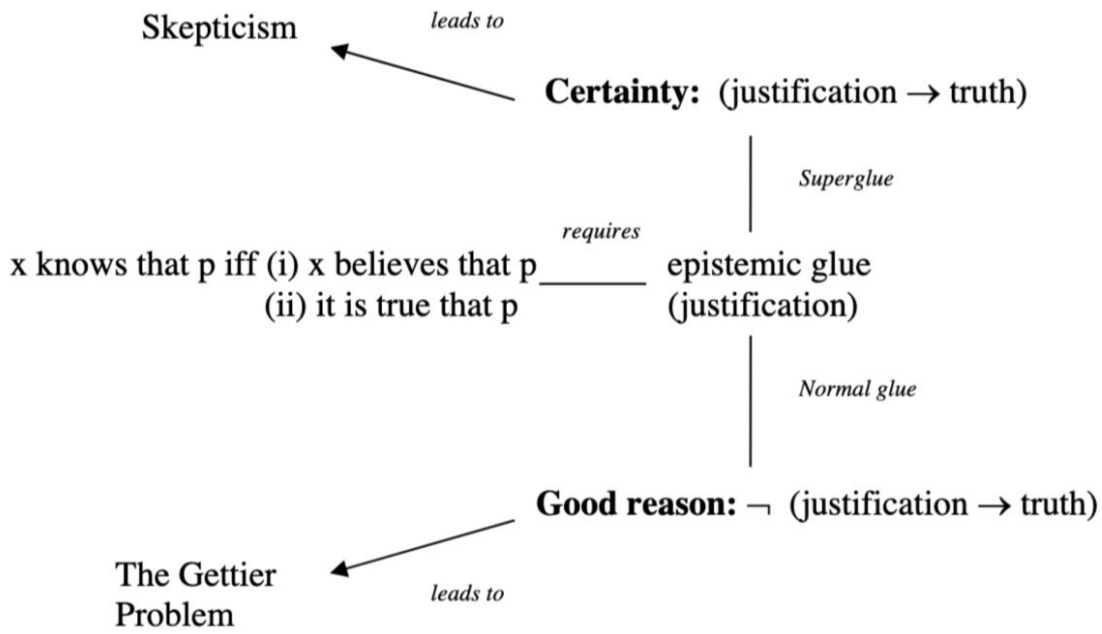


Figure 1: Relationship between Knowledge, Gettier Problems and Scepticism

Fundamentally, scepticism is a questioning of the possibility of knowledge. This is in an attempt to test the strength of our knowledge, which is the extent of knowledge and the degree of certainty. Through questioning even claims which are very difficult to doubt, philosophical scepticism allows us

to arrive at an understanding of the basic beliefs underpinning our world, and from there question these assumptions. In doing so, we are able to ascertain the limits of our knowledge. We will now explore several types of sceptic arguments.

2.3.1 Agrippan Trilemma

The Agrippan trilemma is perhaps the simplest form of scepticism. For any proposition *P*, in order for it to be proven one has to provide a proof *Q*. However, this proof is also a proposition which in turn requires a proof. In such a case, there are only three ways of completing this proof:

(a) Continue to provide new proofs *ad infinitum* (infinite regress).
(b) Use a proposition already mentioned to prove the current proposition (circular argument). Therefore, the prover does not prove anything.
(c) Not provide further proof/assert that it is true (dogmatic assumption).

The trilemma, then, is the decision among the three equally unsatisfying options. In the status quo, we would therefore have to bite the bullet and accept the trade-offs of any option. Accepting the infinite regress means that we will never reach the foundations of any knowledge claim, a circular argument cannot be proven to be reliable since it attempts to prove itself, and a dogmatic assumption is weak. Of course, there are individuals who end up arguing for certain positions (e.g. epistemological infinitism and foundationalism), but the burden is on them to prove that these positions are legitimate.

2.3.2 Cartesian Scepticism

Descartes argues that scepticism should be used as a tool instead of just a source of doubt. This way, we are able to improve the epistemic standing of our inquiries, pushing the boundaries of knowledge. As a result, Cartesian scepticism (which he devised) is a methodology of doubt, used to systematically sort out true claims from claims which are false/require suspension of judgement. Given that knowledge is contingent on other knowledge claims, if the base of knowledge claims is not considered as knowledge, then its reliant arguments also fail. Notably, there are three arguments raised, trying to prove that we need to suspend our judgement with regard to all knowledge.

The first is known as the Argument from Illusion. Given that our senses have deceived us before, we should not trust our senses unless we are sensing in good conditions. Example: When we hold a straight stick underwater it appears bent due to the refraction of the water. Even though we know that the stick is straight, the mental image of the stick is that it is bent. Therefore, our senses do not give us a direct perception of the object (which are its inherent properties), but provide us with indirect sense data (an illusion), which can be unreliable as shown above.

The second argument is known as the Dream Argument. This argument goes one step further, proving that even in cases where our senses are perceiving in good conditions, we still cannot trust sense data. This is because we cannot tell whether we are dreaming or are awake. Hence, given the possibility that we are dreaming, any sense data that we obtain can be doubted. However, this argument is limited, as it does not extend to universal, abstract concepts such as colour and mathematics.

Finally, to deal with the above limitations, the Evil Demon Argument has been raised. This argument posits that there is an all-powerful evil demon which keeps on deceiving people, placing the notions of concepts like mathematics and colour when in reality they do not exist. Given that there is no way to prove or disprove this possibility, we have to doubt these forms of knowledge as well.

2.3.3 Humean Scepticism

Humean scepticism premises itself on the issue of cause-and-effect and induction. Hume argues that we do not see cause and effect, rather what we observe is the constant conjunction of events. Hence, we must be sceptical about knowledge derived from cause-effect and from induction. Example: In the image below, what we observe is not the white ball hitting the red ball, causing it to move. Rather, we only observe the red ball moving away after contacting the white ball. To assume causation in this instance would be to apply inductive logic — we tend to anticipate the 'effect' after experiencing conjoined events occurring multiple times.

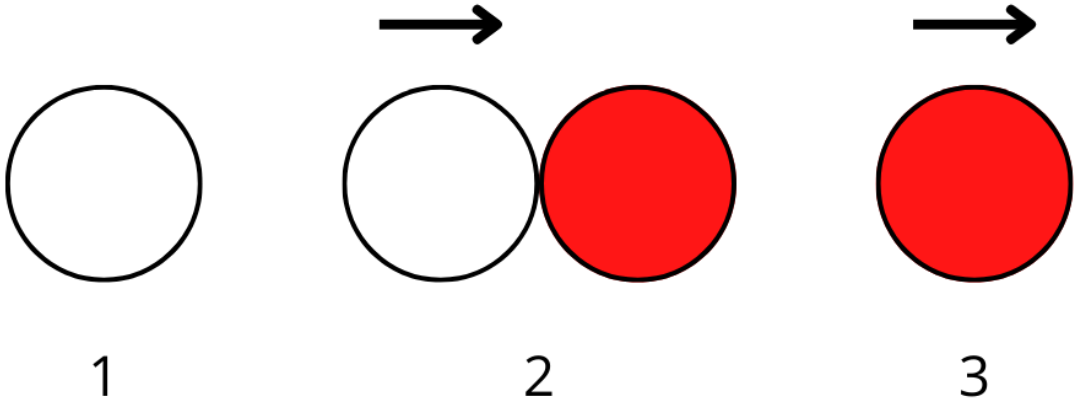


Figure 2: Diagram of Hume's Billiard Ball Example

There are several reasons why the above argument is likely to hold. First, we are using the past to generalise into the future, which we have no conclusive way of determining. Second, epistemic luck is not removed, hence it is possible for events which are not related to occur in conjunction. Thirdly, in arguing that induction is a justified means of understanding our world we are assuming that our world is uniform and consistent, which in and of itself is a principle which is derived from induction; this is a circular argument.

Naturally, this argument excludes a vast majority of our knowledge claims which rely on induction, such as science. A rigid subscription to Humean scepticism easily leads to radical scepticism or solipsism, and is not considered to be a healthy means of scepticism.

2.4 Responses to Scepticism

In response to scepticism, some have tried to find ways to accept conclusions in spite of their sceptical attacks. If we were to deny the conclusion, then we would have to re-evaluate much of our current knowledge claims.

2.4.1 Transcendental Arguments

Transcendental arguments are arguments which serves to prove the existence of fundamental objects such that experience is possible. They show that there are situations which doubt cannot be thrown upon. These anti-sceptic arguments typically take the following form:

(i) *Y is true*. (where *Y* is something that the sceptic acknowledges to be true)
(ii) *X is necessary for Y*.
(iii) *X is true*.

Example: In order to question if language truly exists, we have to think and formulate our response in a language. Therefore language exists by virtue of the fact that we are questioning it. Similarly, Descartes arrived at *dubito, ergo cogito, ergo sum* (I think therefore I am). Descartes uses this to then build more complex ideas — he uses this claim alongside the existence of a non-deceptive God to then construct claims through rational endeavour.

However, Stroud asserts that transcendental arguments are limited because they make a connection between our psychological/experiential condition and a metaphysical truth. In such a case, all transcendental arguments tell us is that we *believe* (or even *desire*) that it is necessary for something to exist, but this does not necessarily translate to it actually existing. It follows that transcendental arguments tell us about our psychological necessities, but this cannot extend to metaphysical necessities. Bridging this gap would require us to subscribe either to verificationism (where a knowledge claim can be definitively proven to be true or false) or idealism (our mind is a direct reflection of our reality). The problem is that both these methods render the transcendental argument useless, for if we are able to directly verify claims in the real world or if our mind reflects reality, then we would not be sceptical about claims in the first place. Despite this, Stroud is willing to accept that transcendental arguments which are able to prove the existence objects solely in the psyche still hold, for instance that some ways of thinking necessitate other forms of thinking.

2.4.2 Global Scepticism

Global scepticism is the position that all beliefs can be doubted. However, given that the statement "all beliefs can be doubted" itself is a belief subject to doubt, it is self-defeating. The upshot of this analysis is that not everything can be doubted at the same time; if we are to doubt a set of beliefs, we have to take certain other beliefs for granted.

2.4.3 Hume's Mitigated Scepticism

Hume argues that there are some things which we invariably cannot help but believe, and hence moderate our scepticism towards it. Example: While we can doubt if there is a dagger coming towards us, we cannot help but flinch, believing it is. Hence, Hume distinguishes between philosophical enterprise and how we experience the world.

More broadly, this can be taken as an argument to show that radical sceptics are not genuine sceptics, since they cannot live their lives if they were to distrust all knowledge that we know of the world. If they do not even genuinely support their position, then perhaps it is not a legitimate one but is merely done for the sake of it.

2.4.4 Appeal to Ordinary Language

Wittgenstein argues that philosophers have set far too strict standards for what should be considered knowledge, and has abandoned everyday use of the word "know". Such scepticism therefore defeats the purpose of philosophy, isolating the study of knowledge in an overly controlled environment detached from reality. To have such a radical departure from the ordinary "know" requires acceptance from society which is extremely unlikely to arise. In essence, this appeal lowers the bar of certainty required, as a layperson does not need absolute certainty to grant a claim as knowledge.

2.4.5 Appeal to Common Sense

In the same vein as Wittgenstein, Moore argues that there is a need to return to common sense, where we know things to be true without knowing how we know them. After all, it is impossible to be constantly sceptical, and common-sense propositions (such as the claim that we exist) have to be

true in order for the philosopher to even begin sceptical inquiry. Given that it is more reasonable to believe in common sense (as compared to a weird belief that you magically make up), when challenged by sceptics we should question not the common-sense proposition but rather the sceptical claim — defying our common sense to be sceptical is queer.

3 THEORIES OF TRUTH

If we are to work with the JTB model of knowledge, we would need to figure out a suitable understanding of truth. That is to say, what are truths, and what makes them true? With truth being a key subject in philosophy, many theories of truth have arisen. We shall explore some of the theories of truth in this chapter.

3.1 Correspondence

The correspondence theory of truth is perhaps the most commonly held understanding of truth. It states that a belief is true it corresponds to an existing fact. Importantly, this theory presumes that truths are a metaphysical object; they necessarily exist. Example: A belief that “the cat is on the mat” is true if and only if in fact, the cat is on the mat.

Despite its popularity, there are several notable criticisms of this theory. For one, it is incredibly difficult to establish correspondence — given that we are constantly applying our own perceptions and judgements to a situation, there is no way for us to access reality independently. Furthermore, in some situations it is difficult, if not impossible for us to observe the truth (imagine atoms). Scepticism does play a part here (especially those of Descartes) since they undermine our ability to verify the truth. Second, this theory does not account for some domains of discourse where there are no facts or there is no verifiable correspondent truth. For instance, while logicians acknowledge that there are logical truths, there are no logical facts. Alternatively, conceptions of truth might not exist in fields such as aesthetics and ethics. In such cases, correspondence cannot be used to ascertain truth.

3.2 Coherence

In opposition to the correspondence theory of truth, the coherence theory of truth arose. This theory posits that a belief is true if and only if it can be a part of a coherent system of beliefs. The appeal of this theory is that it allows us to determine truth without escaping our own beliefs (thus overcoming the criticisms set out for correspondence). Example: Even if we cannot truly observe subatomic particles, the fact that experimental results cohere with our theoretical understanding makes us able to accept the existence of subatomic particles as true.

Perhaps the biggest issue with the coherence theory of truth is that it is possible for two diametrically opposing yet individually internally coherent systems of knowledge to arise. For instance, a flat earther can create a web of beliefs that make sense, even though we intuitively see it as false. Therefore, a problem arises when we cannot determine which of the sets of knowledge to accept. A smaller criticism is that if there exist beliefs which cannot cohere with any set of propositions, then their truth value cannot ever be determined. However, it is debatable as to whether such transcendental beliefs exist in the first place.

3.3 Pragmatism

Pragmatism is the belief that what makes beliefs true is that they are useful. As long as the belief does not conflict with subsequent experience, they have practical truth. This might seem to be an

appealing theory for truth, since truth and pragmatism are highly correlated — if something is able to be useful to us (in being able to explain observed phenomena and predict new ones), then it would have to be true. In a world where we cannot directly observe truth, pragmatism can be a good way of marking truth. Pragmatism also allows for varying degrees of truth, which seems to align with how we view the world. For example, we still use Newton's laws of motion for most calculations, even though minor relativistic effects would come into play. This is because Newtonian mechanics is able to account for many phenomena we experience in the real world (to a relatively accurate degree), as well as make good predictions for us. Newton's laws are not false (for if it were, we would not use it), but merely *less true* than those of relativity — the utility of it grants some degree of truth.

However, this seems to run contrary to some of our intuitive conceptions of truth. There are many counterexamples of useful beliefs which are not necessarily true. Example: The belief that "wounds are a way for demons to enter and possess your body" is useful insofar as it encourages people to get their wounds treated, but is not true based on our current understanding of science. We seem to have a conception of truth that goes beyond mere pragmatism, transcending any practical purpose that we assign to a concept. If that is the case, we cannot rely on pragmatism to ascertain truth.

Additionally, there seems to be a problem with determining the utility of claims. This is especially so if we take William James' form of pragmatism, which suggests that truth lies in the subjective perspective of the individual. If we take this to be the case, we arrive at seemingly problematic conceptions of truth. To the Nazis in WWII, a statement such as "the Jews are vermin and should be exterminated" would be true since it is useful for them to rationalise the Holocaust; to men, a statement such as "We should not trust her perspective since she is a woman" might be useful (which leads to epistemic injustice, as argued by Fricker). Clearly, using usefulness as a benchmark seems to raise epistemological and moral issues with our knowledge, and such issues need to be carefully negotiated if one is to support this position of knowledge.

4 THEORIES OF JUSTIFICATION

Having just completed theories of truth, we will need to similarly consider theories of justification to accept the JTB model of knowledge. Referring back to the Agrippan trilemma, it is easy to see the issue with justification. If we continually provide justifications to justify our previous justifications, we will only result in infinite regress. In order to prevent this infinite regress of justification, several stances have been taken by philosophers.

4.1 Internalism and Externalism

Embedded within theories of justification is a quibble about the meaning of justification itself. This in turn will entail certain conceptions of justification. Broadly, this can be split into internalist and externalist camps; the former believes that reasons to believe in a claim can be entirely accessed by an individual's first-person cognitive perspective, while the latter argues that there are elements of justification that lie external to the individual.

4.1.1 Internalism

To this group of individuals, there are several reasons why justification can be internally accessed by individuals. In the case that justification is defined as a deontological concept (that to be justified in believing a claim, one must have fulfilled his intellectual obligation to follow the evidence, rule out all other possible explanations etc.), since the inquirer *ought* to meet certain duties prescribed to him,

then he *can* fulfil those duties. However, this is contingent on such duties even existing in the first place. Moreover, this seems to be problematic when one's duties are inherently constrained by difficulty in epistemic access — a person who lacks the means to conduct research might fulfil his intellectual duties in believing that the Earth revolves around the Sun, but we would not conventionally consider him to have proper justification for his claim. The alternative conception of internalism is that justification is defined in terms of guidance (i.e. that justification serves to guide individuals in deciding what to believe). However, this seems to assume that belief is a voluntary process, something that we do not intuitively accept to be true. Finally, proponents of internalism might distil the issue to whether or not we have fundamental claims that need no further justification that we can access. Nonetheless, whether this is true is contentious.

Irrespective of how the internalist supports their claim, the fundamental aim is to show that there are some base claims that are accessible to the individual, from which one can then build up all other forms of knowledge. This will lead to foundationalist theories of justification.

4.1.2 Externalism

The case for externalism is constructed in response to various attacks on internalism. One of the strongest arguments in support of externalism is the fact that animals, children and unsophisticated persons are capable of arriving at knowledge about things, even if they are incapable of rationalising why they have good reason in support of such a claim (in the way that internalism would expect them to). In such circumstances, justification seems to become an external concept that not everyone can access independently but exists nonetheless. The response, of course, would be to claim that they have internal justification for their claims, but merely that they are incapable of expressing it; they are thus held tacitly or subconsciously. Alternatively, an argument in support of externalism would be to claim that any internal form of justification is flawed, rejecting sources of knowledge such as our senses, testimony, memory etc. as foundations of knowledge that need no further justification.

The most common form of externalist theory would be reliabilism.

4.2 Foundationalism

Perhaps the biggest and most classical theory of justification is the foundationalist school of epistemic justification. Those who believe in this theory assert that there are certain beliefs which are self-justified and need no further justification — they hence form the bedrock from which all other justifications stem. Below we will delve into two different foundationalist views, rationalism and empiricism. It is important to keep in mind that these two positions are extremes of each other, and that philosophers rarely hold purely rationalist or empiricist views. Instead, think of the two as ends of a spectrum that on which different philosophers are placed.

4.2.1 Rationalism and Platonic Forms

Rationalists believe that reason is the primary source of knowledge. For classical rationalists, knowledge is gained *a priori*; we do not need to experience the world in order to gain knowledge. In addition, given that they are primarily generated through reason, they would be analytic in nature. This means that they are true by logic or definition. An example of an analytic proposition is "A bachelor is an unmarried man."

Figure 3: Plato's Allegory of the Cave

Plato (the first rationalist) believed in the existence of mental things which he refers to as Forms. These Forms are the essences of various objects, and are aspatial and atemporal. All objects and abstractions in our reality can therefore be traced back to a form. For example, a table is merely a manifestation of the Form of a table, which encapsulates 'table-ness'. In the beginning, we are all in the realm of unknowingness (referencing Figure 3, this looks like perceiving the shadows and conjecturing an understanding of the world). Alas this is a very shallow understanding, for reason allows us to make abstractions of our world (becoming the people on the left side of the picture), and eventually understand the true essences of our world. Forms are hence the most real, and provide us with a significant amount of knowledge. In order, the levels of knowledge are:

(a) Conjectures and Imaginations
(b) Perceptions and Beliefs
(c) Understanding (Lower Forms of math, science etc.)
(d) Reason (Higher Forms of beauty, truth etc.)

Notably, Plato argues that these forms are innate. He argues that our souls have been stamped with the notion of Forms, and that as we descended down into the worldly realm, we have forgotten these Forms. According to him, all learning is therefore recollection. Plato raises the example of what we would now refer to as Socratic questioning, where he gets a boy to double the area of a square without telling him how to do it, instead guiding him via questions. Hence, the boy arrived at the conclusion without any new knowledge being provided to him, which must mean that he must have acquired the knowledge beforehand (in Platonic heaven).

Of course, the above is entirely based on the analogies of Plato. Over the years, rationalists have provided four key arguments as to why his theory of Forms would be true. The first is the Argument

from Recognition, which states that we can recognise manifestations of Forms even if we have not necessarily encountered it before. Example: We do not need to have seen a Chihuahua before to recognise that it is a dog, because we innately have an idea of the Form of dogs.

Second is the Argument from Epistemology. Plato argues that what does not stay still cannot be grasped properly — if it constantly changes, we cannot understand it. However, sensible things are always moving and changing across time and space, no matter how miniscule. As a result, Plato concludes that sensible things can never be known. Yet, knowledge is possible, which implies that there must be non-sensible things which we know, which are the Forms.

Thirdly, an Argument from Perfection is proposed. Intuitively, we can conceivably know of perfection, even as there is no object that is truly perfect in our world; there are always methods to better something in our world. Hence, to know what perfection means would presume a higher object that we can access and that is more complete than anything we have in our reality. These, rationalists argue, are the Forms.

Finally, Plato turns to a Realism about Mathematics to prove the existence of Forms. Intuitively, notions about mathematics are discovered and not made up. If they are discovered, then there has to be an object of the non-sensible kind which the mind can grasp hold of. Mathematics exists independently of Man, and exists as its corresponding Form.

While it is intuitive to believe in the above arguments, their links to the existence of a world of Platonic Forms is perhaps less intuitive. In the status quo, for instance, we regularly face confusion over what an object is, which should not happen if there is a correspondence between the Forms and their instantiations. However, the simple rejoinder to this is that such confusion only happens due to a lack of understanding and unspecific language. At the same time, it would be possible for items to be related to more than one Form (e.g. something can function as both a chair and table, and hence is a manifestation of both Forms). In addition, there is an issue with how we are able to trace back objects in the real world to the Forms; the link from “living things” to “beauty”, for instance, is unclear. Finally, there is a lack of clarity on what these Forms actually are. Example: Given that there are many kinds of triangles, what exactly is the perfect triangle/Form of triangles?

4.2.2 Empiricism: Locke and Hume

Empiricists believe that experience is the primary source of knowledge. Knowledge is therefore *a posteriori*, and do not exist prior to Man. In addition, such knowledge is synthetic in nature, where it assigns qualities to an object (predicate not in subject). An example of a synthetic proposition is “The ball is red.”

Locke (one of the three great British empiricists) provides several arguments against innate ideas, which is central to rationalism. In the first Argument against Innate Ideas, he notes that innate ideas must be ideas that one is conscious of, because it exists in the mind. Asserting that there are no ideas or principles which one is consciously aware of from birth (*tabula rasa*), it follows that innate ideas do not exist. Second, Locke argues that innate ideas have to be settled and unchanging. However, we gain knowledge in degrees, learning more about the world based on our experience (e.g. multiplication tables). Therefore, this knowledge is not settled and there cannot be innate ideas. Third, Locke turns to the concept of Identity, one of the ideas that we would most intuitively call innate. He shows that there is difficulty in resolving the nature of Identity, and in so doing proves that it is not settled. If such a basic idea is not innate, then other complex ideas which are built upon basic ideas

cannot be innate. Finally, Locke points out that innate ideas have to be universally known and naturally agreed, which is not the case with concepts such as Identity. In response to his concepts of innate ideas, rationalists have pointed out that we are still in the process of reaching a distinct, settled idea. If we are to rush through intellectual inquiry (seeking solution in Empiricism when it is wrong), then we are more than likely to run into error.

Nonetheless, if knowledge cannot be gained through innate ideas, for Locke it has to be fundamentally gained through sense data. Notably, this sense data still requires the mind actively processing and perceiving our senses to create knowledge. This accounts for Plato's Argument from Recognition — if the mind is still actively processing, we are able to perform actions such as determining the concept of a dog from the sense experiences of many kinds of dogs. This sense data is also incorrigible (cannot be corrected), which means that even if our senses are deceiving us vis-à-vis the Evil Demon Argument, it is undeniable that we are still receiving sense data which we can then interpret, forming the foundation of knowledge.

Separately, Hume (another great British empiricist) argued that Rationalism was incapable of granting much knowledge. He raises what we now refer to as Hume's Fork, where he divides knowledge into two separate categories: relations of ideas (analytic *a priori*) or matters of fact (synthetic *a posteriori*). He argues that Rationalism can only provide us with relations of ideas, which is trivial and of little practical value to us as we cannot extrapolate it into our reality. It cannot provide us with matters of fact because it can be negated at any moment without a contradiction arising. As a result, if we want to know matters of fact and gain more knowledge, we have to rely on our experience.

The above argument is premised on the fact that such truth is contingent. However, Spinoza and Leibniz (rationalists) argue that truths of our world are necessary, and that just because we do not see the reason(s) behind events does not mean that they are random. They turn to an argument of God, where he knows how everything is connected and necessary. We only perceive it as contingent because humans are not powerful enough to see everything the way it is. The simple rejoinder to this is to question the existence of God in the first place. Another set of counterarguments is premised on the flaws of our senses. For one, they argue that our senses are extremely limited, presenting a small sensory window which might not tell us the entire truth. In addition, some have pointed out how our senses are corrigible, especially with the presence of preconceived notions — scientists initially thought that the head of sperm was a little man because they believed that sperm was a miniature human being. Hence, drawing conclusions about the world from such sense data (even if they are incorrigible) seems especially problematic.

4.2.3 Kant

As mentioned above, there are visible problems with foundationalism, comprised of both Rationalism and Empiricism. For the former, it cannot account for knowledge of the external world, due to objections against cause-effect and of God. Empiricism, on the other hand, introduces uncertainty in order to provide more knowledge, but this knowledge is also vulnerable to scepticism. For Kant, he argues that "thoughts without content are empty, intuitions without concepts are blind". With this, Kant set out to save foundationalism in his seminal book *Critique of Pure Reason*.

Kant noticed that both Rationalism and Empiricism take the mind as a passive receiver of phenomena, where our mind conforms to the nature of objects. He flips this logic entirely, and argued that instead of the mind being a passive receiver of knowledge, it is an active constitutor. This means that an object conforms to our mind instead. He posits that there is a gap between our experience of the

world (the Phenomenal) and the world as it really is (the Noumenal), caused by our consciousness. In particular, there exist two kinds of filters of consciousness: the Sensibilities and Understanding. These filters of consciousness cannot ever be removed, as they are pivotal to experiencing the world. Sensibilities allows the mind to receive data from the Noumenal, and consist of Space and Time. On the other hand, Understanding help us to make sense of data from the Noumenal, and includes concepts such as Cause-Effect. Hence, we perceive objects as having a cause-effect relation and exist in time and space, even as it is not the case in the Noumenal. Clearly, there is a need for both content (Noumenal data) and concepts (filters of consciousness).

A simple thought experiment seems to verify Kant's thesis: we can imagine a world where space is empty and time flows backwards, but we cannot seem to sustain the thought of a world where there is *no* space and/or time. This therefore proves the existence of Sensibilities (Space-Time), which are integral to our experience. To prove the existence of *a priori* concepts such as Cause-Effect, consider how we are able to differentiate between subjective changes (e.g. moving around a house, where our observations change but the house physically remains the same) and objective changes (e.g. seeing a bike fall over). The fundamental distinction is the notion of irreversibility, that I can reverse my movements in the house but not the bike. However, this idea of irreversibility cannot be gained from our real-world experience — it has to exist in the mind *prior* to experience. This notion of irreversible succession can only be brought about through cause-and-effect, thus proving that it is a necessary faculty of the mind.

An interesting consequence of Kant's analysis is that knowledge gained is synthetic *a priori*. It is synthetic because the mind is actively constituting knowledge and applying filters of consciousness, yet it is *a priori* because filters of consciousness have to exist in order to experience, and is *a priori*. Example: It would be a mistake to consider math as analytic *a priori*, as the predicate is not contained within a subject — if it were, all mathematics would be immediately obvious to us. To perform an operation such as addition, therefore, the mind is not analysing them but rather putting them together (synthesis). Given that all arithmetic is derived from counting, we need an ultimate unit to help us to count every single thing. For Kant, this is the empty moment, encapsulating both Sensibilities. Arithmetic is based off our understanding of space-time, as time is the addition of successive units of the empty moment. Therefore time is required for arithmetic. In geometry, space is required in order to bridge qualitative notions ("straightness") with quantitative concepts ("shortest"). Clearly, mathematics is synthetic *a priori*, requiring Forms of Sensibilities to analyse the predicate, yet not requiring any experience.

Through this formulation of foundationalism, Kant was able to rescue knowledge from scepticism. If these filters are universal, elements such as causality are directly built into our experience and are required for experience, allowing us to gain more knowledge with certainty. Kant combines the strengths of both Rationalist and Empiricist schools of thought, which are certainty and breadth of knowledge respectively. The limitation of such a theory, however, is that we can never gain knowledge of the Noumenal world; we can never remove our own filters of consciousness.

4.3 Anti-Foundationalism

In contrast to foundationalism, anti-foundationalists hold the belief that there is no ultimate foundation for our knowledge; even if it did exist, we do not need to know it with certainty. Acknowledging that our beliefs can never be absolutely justified, they hold justification in degrees, where some beliefs are better supported than others. There are two key anti-foundationalist positions, which are Coherentism and Reliabilism.

4.3.1 Coherentism

Coherentists argue that beliefs are justified by other beliefs in a web. In this way, there is no distinction between basic and derived beliefs; all knowledge is reliant on support from each other. If knowledge can fit into the system easily, then it would be more strongly justified as a result. In order for a belief to cohere in such a circumstance, it would have to fulfil the following three criteria:

(a) Consistency (beliefs should not contradict with one another).
(b) Cohesiveness (beliefs mutually support one another).
(c) Comprehensiveness (the resulting belief system should account for a large number of things).

It is important to note that this system allows for elements to be in tension with one another, but not directly contradicting. One such example is Einsteinian and Newtonian mechanics. Overall, Coherentism allows for our beliefs to be revised as we have more information about our reality, making our knowledge more coherent. Furthermore, this account also deals with the reality that some beliefs are more easily changed than others — if it is at the centre of our web (and hence is connected to a lot of other beliefs), then we are more conservative about rescinding our belief in it. Coherentism also provides us with a lot more knowledge, albeit at the cost of some certainty.

However, there are some critiques of this approach. For one, foundationalists assert that some beliefs cannot be revised at all, such as those of *a priori* truths and sense-data. Of course, the simple rejoinder is that sense-data is usually corrigible, and that at the very worst, coherentists will concede that there are beliefs which are immune to revision, while allowing the others to be revised. Second, similar to the Coherence Theory of Truth, it is possible for two webs of beliefs which contradict each other to arise, meaning that opposing claims can be equally justified. As a result, there is (once again) an issue of which sets of knowledge to accept.

As a side note, coherentists are agnostic about whether or not justification is internalist or externalist. If they support the former, then they would concede that certain sources of knowledge are indubitable foundations, and therefore cannot support a coherence theory of justification in the strictest sense. At the same time, they do not need to commit themselves to an externalist position about justification, since this an internal process that is conducted by individuals without needing to point to other metrics of justification that lie beyond the individual.

4.3.2 Reliabilism

Reliabilism posits that a belief is justified if and only if it is the result of a reliable process. For the reliabilist, there is no need to know how the reliable method works to trust it. Example: A sailor might believe that the compass points North because it points away from demons, but that does not discredit any knowledge gained from the compass. Such an approach is intuitive, as it accounts for how we gain knowledge in the status quo.

However, there are obvious issues with regard to its definition. The threshold of reliability seems arbitrary and subjective, given that there are instances where a seemingly reliable method has failed us before. If we are to qualify the conditions for reliability, that would result in an impossibly long list of details. In referring to such conditions (and trying to find the acceptable threshold for justification), we invariably return to the definition of reliable, and clearly argue in a circle: “A reliable method is reliable”. In addition, it is entirely possible for a reliable process to be reliable by luck. Therefore, Reliabilism succumbs to the Problem of Induction — being reliable in the past does not guarantee that the process will be reliable in the future.

Furthermore, a well-known problem of reliabilism is the generality problem. This is a problem associated with determining, for a given belief, which belief-forming process type is relevant for justification. In other words, when we consider how we justify the claim “There is a cat on the mat”, do we consider the general process of vision, the process of vision for objects in our close vicinity and with adequate surrounding brightness (a more specific process), or the more general process of perception/sensation? This is an important question to consider, since each of these processes has a different level of reliability, which could impact the final verdict that reliabilists make in whether a claim is really the result of a reliable process.

There is no consensus or clear solution to this problem. Some argue that we should fall back on commonsensical notions of how we support a claim to understand which processes to consider, while others use psychological processes as a list of processes that we should consider, with circumstantial information being irrelevant. Finally, there are even some that attempt to show that this problem is not unique to reliabilism, but is a prevalent issue across all epistemological positions. Proponents like Comesaña argue that if other evidentialism and other epistemological theories seem to gloss over the generality problem, then it is not a legitimate critique of reliabilism.

5 THEORIES OF PERCEPTION

Evidently, our knowledge is derived from perception. Note that this is something that even Rationalists do not contest; instead what they dispute is whether perception can be used as adequate justification. Hence, it is useful to consider different theories of perception, to better understand how much we perceive is actually of the real-world and how much is of the mind.

Refer to Figure 4 for the Perception Continuum, which shows how theories of perception can be viewed on a spectrum, with realism and anti-realism as two opposing ends of the spectrum. Realists believe that objects are independent of the mind (and exist even if there is no one to perceive it), while anti-realists hold the belief that objects are mind-dependent.

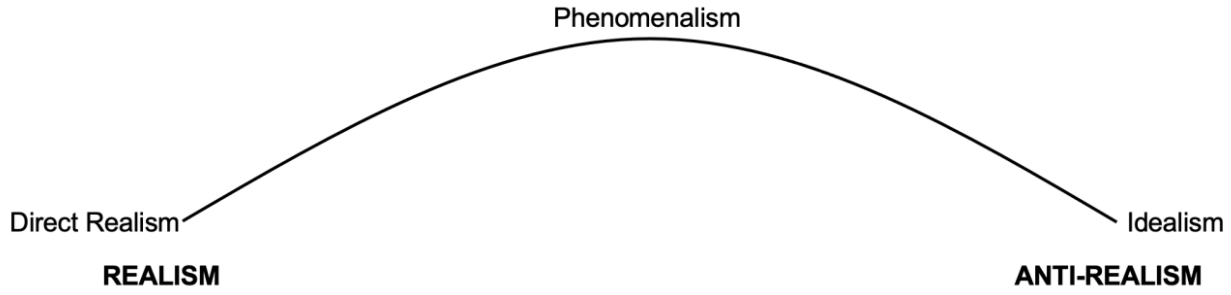


Figure 4: Perception Continuum

5.1 Direct Realism

Direct realists believe that we perceive objects directly, and the world is exactly as we perceive it. They also believe that objects retain their fundamental properties when not observed, showcasing their realist beliefs. The flow of information is therefore from objects (which possess certain qualities) to our minds perceiving those qualities, without any form of mediation.

This position, while intuitive, seems rather naïve, giving it its alternative name of naïve realism. Several issues are pointed out about this position. First, perceptual variation may lead to a change in

perception, even if the object does not change. For instance, a colour-blind person will perceive the same world differently from a normal person. By direct realism, objects would hold both colour and a lack of colour at the same time, which is impossible. Second, if direct realism is correct, there would be no hallucinations and illusions, as we are directly perceiving the world; however the reality is that they exist. Third, objects can appear different to us without a change in its fundamental qualities. For instance, a ball that is coming towards us appears to be growing bigger even as it has the same size. Fourth, we are all susceptible to the Priming Effect, where our past experiences influence our perceptions about an object in the present. Example: Placing a hand into ice-water and another into warm water, before submerging both hands into a bucket of room-temperature water will cause one hand to feel warm and the other to feel cold, which is contradictory if direct realism is true.

5.2 Phenomenalism

Phenomenalism (also known as indirect realism) agrees with direct realism that the world is mind-independent (and hence innately possess certain properties), but disagrees that our senses directly perceive those properties. For phenomenalists, sensations are a representation of and are different from the world as it is. This approach seemingly allows us to account for sense deception and hallucinations, which are criticisms of direct realism. At the same time, it is intuitive to us as it appears to fit science into our understanding of the world. This is because it tells us, for instance, that objects are made of atoms which are mostly space, and that nothing has colour. Hence, by indirect realism, the world as is explained by science would be different from the world that we perceive of colour and of solid objects.

However, this seems to lead to an issue of representation. For phenomenalists, sense deception occurs when sense data does not match up to the world as it is. Given that we can never transcend our minds and truly see the real-world, it is difficult to prove that our representation of the world is accurate. We are inevitably stuck behind the veil of perception, with no way of understanding the real-world. The rejoinder to this argument is that if the phenomenal world does not match up to the world as it is, then we would not have survived for long as we need perceptions to perform basic functions such as hunting. Our survival is therefore testament to the fact that our senses are giving us an accurate representation of the world. Yet, this argument is vulnerable to attack, as our senses could be designed in a way which allows us to survive but distort the world completely. Overall, the indirect realist fails to adequately respond to the sceptic's position of possible sense deception.

5.3 Idealism

Idealism is a branch of anti-realism, which basically states that the only reality that exists is the reality of which we are directly aware of. There is no need to prove the existence of a material world. For idealists, to exist is to be perceived. As a result, all that exist are minds and their ideas, sensations and thoughts. Notably, it is possible to be Empiricist and Idealist simultaneously. For Berkeley, he argues that all the contents of our minds come from experience. However, this experience is only able to sense properties of objects, not the substratum which holds these properties together. Precisely because we can never know the substratum, it is meaningless, unperceivable and cannot exist. What exists, therefore, with respect to an object is its collection of sense-data.

One counterargument to this radical approach is that it fails to respond to the argument that our senses could be deceiving us. However, the response is that we can identify sense deception through the regularity of our experiences — if we notice that something is off, it is probably an illusion. This response is intuitive as it accounts for how we detect illusions and hallucinations in the status quo.

Another counterargument is that idealism seems to suggest regular gaps in the existence of things when they are not observed. One moment an apple could be falling and the next it seemingly ceases to exist because we look away and are not perceiving it. Under such a circumstance, it would be absurd to believe that the world is behaving regularly. Idealists embrace the view that believing that matter behaves regularly is a logical leap just as absurd as idealism, because for indirect realists they cannot access matter directly. In addition, Berkeley attempts to use the existence of God to explain away the gaps in existence, for God perceives all things all the time, and hence allows us to experience things in a regular and predictable manner.

APPENDIX B: IS JUSTIFIED TRUE BELIEF KNOWLEDGE?

ANALYSIS 23.6 JUNE 1963

IS JUSTIFIED TRUE BELIEF KNOWLEDGE?

By EDMUND L. GETTIER

VARIOUS attempts have been made in recent years to state necessary and sufficient conditions for someone's knowing a given proposition. The attempts have often been such that they can be stated in a form similar to the following:[1]

(a) S knows that P *IFF* (i) P is true,
(ii) S believes that P, and
(iii) S is justified in believing that P.

For example, Chisholm has held that the following gives the necessary and sufficient conditions for knowledge:[2]

(b) S knows that P *IFF* (i) S accepts P,
(ii) S has adequate evidence for P, and
(iii) P is true.

Ayer has stated the necessary and sufficient conditions for knowledge as follows:[3]

(c) S knows that P *IFF* (i) P is true,
(ii) S is sure that P is true, and
(iii) S has the right to be sure that P is true.

I shall argue that (a) is false in that the conditions stated therein do not constitute a *sufficient* condition for the truth of the proposition that S knows that P. The same argument will show that (b) and (c) fail if ' has adequate evidence for ' or ' has the right to be sure that ' is substituted for ' is justified in believing that ' throughout.

I shall begin by noting two points. First, in that sense of ' justified ' in which S's being justified in believing P is a necessary condition of S's knowing that P, it is possible for a person to be justified in believing a proposition that is in fact false. Secondly, for any proposition P, if S is justified in believing P, and P entails Q, and S deduces Q from P and accepts Q as a result of this deduction, then S is justified in believing Q. Keeping these two points in mind, I shall now present two cases

[1] Plato seems to be considering some such definition at *Theaetetus* 201, and perhaps accepting one at *Meno* 98.

[2] Roderick M. Chisholm, *Perceiving: a Philosophical Study*, Cornell University Press (Ithaca, New York, 1957), p. 16.

[3] A. J. Ayer, *The Problem of Knowledge*, Macmillan (London, 1956), p. 34.

in which the conditions stated in (a) are true for some proposition, though it is at the same time false that the person in question knows that proposition.

Case I:

Suppose that Smith and Jones have applied for a certain job. And suppose that Smith has strong evidence for the following conjunctive proposition:

(d) Jones is the man who will get the job, and Jones has ten coins in his pocket.

Smith's evidence for (d) might be that the president of the company assured him that Jones would in the end be selected, and that he, Smith, had counted the coins in Jones's pocket ten minutes ago. Proposition (d) entails:

(e) The man who will get the job has ten coins in his pocket.

Let us suppose that Smith sees the entailment from (d) to (e), and accepts (e) on the grounds of (d), for which he has strong evidence. In this case, Smith is clearly justified in believing that (e) is true.

But imagine, further, that unknown to Smith, he himself, not Jones, will get the job. And, also, unknown to Smith, he himself has ten coins in his pocket. Proposition (e) is then true, though proposition (d), from which Smith inferred (e), is false. In our example, then, all of the following are true: (*i*) (e) is true, (*ii*) Smith believes that (e) is true, and (*iii*) Smith is justified in believing that (e) is true. But it is equally clear that Smith does not *know* that (e) is true; for (e) is true in virtue of the number of coins in Smith's pocket, while Smith does not know how many coins are in Smith's pocket, and bases his belief in (e) on a count of the coins in Jones's pocket, whom he falsely believes to be the man who will get the job.

Case II:

Let us suppose that Smith has strong evidence for the following proposition:

(f) Jones owns a Ford.

Smith's evidence might be that Jones has at all times in the past within Smith's memory owned a car, and always a Ford, and that Jones has just offered Smith a ride while driving a Ford. Let us imagine, now, that Smith has another friend, Brown, of whose whereabouts he is totally ignorant. Smith selects three place-names quite at random, and constructs the following three propositions:

(g) Either Jones owns a Ford, or Brown is in Boston;

(h) Either Jones owns a Ford, or Brown is in Barcelona;
(i) Either Jones owns a Ford, or Brown is in Brest-Litovsk.

Each of these propositions is entailed by (f). Imagine that Smith realizes the entailment of each of these propositions he has constructed by (f), and proceeds to accept (g), (h), and (i) on the basis of (f). Smith has correctly inferred (g), (h), and (i) from a proposition for which he has strong evidence. Smith is therefore completely justified in believing each of these three propositions. Smith, of course, has no idea where Brown is.

But imagine now that two further conditions hold. First, Jones does *not* own a Ford, but is at present driving a rented car. And secondly, by the sheerest coincidence, and entirely unknown to Smith, the place mentioned in proposition (h) happens really to be the place where Brown is. If these two conditions hold then Smith does *not* know that (h) is true, even though (*i*) (h) *is* true, (*ii*) Smith does believe that (h) is true, and (*iii*) Smith is justified in believing that (h) is true.

These two examples show that definition (a) does not state a *sufficient* condition for someone's knowing a given proposition. The same cases, with appropriate changes, will suffice to show that neither definition (b) nor definition (c) do so either.

Wayne State University

RAFFLES INSTITUTION
KNOWLEDGE AND INQUIRY 2022

CHAPTER 3: MATHEMATICS

1 INTRODUCTION TO MATHEMATICS

It is undeniable that mathematics plays an important role in our everyday lives, helping us live and survive. Mathematics was initially used and developed for the purpose of living our lives, allowing us to perform functions such as taxation and commerce. At the same time, mathematics was (and still is) used to understand patterns in nature, such as those of planets. Later on, mathematics also took on a recreational flavour, being used to solve puzzles and other curiosities.

We think of mathematics to be the most certain field of knowledge available. There are three reasons why this is the case. First, mathematics functions on principles of deduction, where statements have to be logically arrived at from other statements. From this, there is no induction required, and all arguments and conclusions drawn should be true all the time. Notably, even what mathematicians would refer to as a proof by induction is deductive in nature (e.g. $\sum n^2, n \in \mathbb{N}$). Second, mathematics arrives at new knowledge through an axiom-theorem method of construction. This means that the most basic form of mathematical knowledge are axioms, and from there we use aforementioned reasoning to arrive at lemmas and theorems. Aside from the initial set of axioms which are assumed to be universally true, no further information is input into the system to create new mathematics. Finally, it is possible to argue that in the case of mathematics, all statements are analytic in nature, with the subject in predicate. In this case, all mathematical knowledge becomes trivially consistent. As a side note, proofs by contradiction (e.g. $\sqrt{2}$ is irrational) do not undermine the consistency of mathematical statements; contradictions are merely techniques that can be used to generate knowledge in mathematics.

But why does mathematics require essentially absolute certainty in its knowledge? The reason for this lies in how its knowledge is constructed. Precisely because all claims are built on underlying axioms and theorems previously derived, one claim being wrong would imply that all other claims built on it will also fall. Therefore, it is paramount that every step is correct. Moreover, since mathematics is used in other fields of inquiry (e.g. science) as an objective and reliable method to derive knowledge, it is important that the claims that we make in the field are able to withstand scrutiny of the highest level — that is why some philosophers even go so far as to claim that mathematics is the best field of knowledge.

2 THEORIES OF MATHEMATICAL FOUNDATIONS

In the 19th century, there was a keen interest in whether our understanding of mathematics is true and sound. More specifically, the focus was on the foundations of our knowledge, which are axioms and basic mathematical theorems. In trying to show that mathematical knowledge as we know it is correct, several theories have arisen.

2.1 Logicism

The logicist school of mathematics claims that all mathematical objects are logical objects. If this was the case, then mathematical knowledge would be free of contradictions, as well as certain and *a priori*, similar to logic. In order to prove this position, they would have to show how mathematics can be reduced to logic. This means that (foundational) mathematical statements have to have complete generality and is true in virtue of its form rather than its content.

Problematically, such an endeavour is yet to be accomplished. For instance, in Frege's construction of second-order Peano arithmetic from the basic laws of logic, he relies on the principle that:

$$\{x|\Phi x\} = \{x|\Psi x\} \leftrightarrow \forall x(\Phi x \leftrightarrow \Psi x) \quad \text{(Basic Law V)}$$

This principle means that two propositions are identical if their extensions (which are the outputs that make a value true) are the same. For example, $\epsilon(x) = x^2 - x$ and $\alpha(x) = x(x-1)$ are the same because their extensions are — for all values of x, the output of $\epsilon(x)$ and $\alpha(x)$ are the same.

However, this principle is not only not a logical principle, but it also leads to contradiction. This is because Basic Law V presupposes the existence of the class of all Φs, regardless of the defining formula — in order for an identity to hold, the terms must denote an actual set. Therefore, as Bertrand Russell points out, this leads to contradiction if Φ is defined as the class of items fulfilling ¬Φ (i.e. the set of all sets who are not members of themselves). When this is the case, then one will reach the conclusion that $\Phi \in \Phi \Leftrightarrow \Phi \notin \Phi$, which cannot be true. Therefore, Frege's system is inconsistent, and cannot be used to generate a consistent and error-free mathematics.

Alternatively, Zermelo and Fraenkel try to conceive of their own ZF set theory of 9 axioms, and reduce these axioms to logical propositions. However, logicists failed to map all the axioms to logic — the axiom of infinity and axiom of choice eludes logic. Hence, the failure of logicists to prove that mathematics is a form of logic means that the foundation of mathematics is ultimately uncertain, making it vulnerable to sceptical attack. Furthermore, even as the principles of mathematics are logical in nature, this does not prevent mathematics from being vulnerable to contradictions as a result of logical incompatibility between two or more propositions. For instance, Cantor's set theory was shown to have such flaws which undermine the credibility of mathematics. For instance, Cantor's theorem states that:

$$|P(A)| > |A|$$

However, if we let *A* be the set of all sets, then *P(A)* is a subset of *A*, resulting in *A* having a greater cardinality than its power set. This principle fundamentally contradicts Cantor's theorem, showing that the allowing for a set of all sets leads to contradiction, and any theory which allows for such a proposition is inconsistent.

2.2 Intuitionism

Intuitionists perceive mathematics in a drastically different way from logicists. They hold that mathematics is purely an activity of mental construction rather than the discovery of principles in an objective reality. Hence, the many contradictions that arise in mathematics exist not as a result of mathematicians making mistakes as to their arguments, but because the very construction is flawed. Hence, there is a need to rebuild mathematics from the bottom-up, in a manner which makes it free from contradiction.

Such a conquest was undertaken by philosophers such as Brouwer. As their name suggests, in their reconstruction there is a heavy emphasis on intuition — the validity of a construction can only be verified through intuition. From an intuitive understanding of the number 1, we can use the same mental process to construct an intuitive understanding of the number 2, 3 and so on. This process is necessarily inductive in nature, since there is no logical basis for the generation of successive constructs from the number 1. Using such constructs, we can then derive intuitionistic math, consisting of intuitionistic definitions, theorems and proofs that we construct. Any theorem in classical mathematics not consisting of constructs (such as those of infinite sets like $\mathbb{N}$) are rejected and deemed a meaningless combination of words. The above system is guaranteed to provide us with mathematics free of contradiction because constructs (created by the intuition) definitely exist and cannot be contradictory as a result.

It is interesting to note that intuitionists were successful in creating an intuitionistic mathematics. While many of the results in classical mathematics could be replicated under this intuitionistic regime, some theorems had to be rejected as they do not consist of constructs — ironically, Brouwer had to reject his own Fixed Point Theorem because it could not be proven through intuition and mental construction. It is this (among other reasons) which led to its poor reception by the mathematical community. Another reason for it not gaining popularity is its comparative lack of elegance as compared to proofs in classical mathematics. Applying Occam's Razor, mathematicians are reluctant to accept intuitionism over their current proofs. Finally, given that intuitionism is so heavily reliant on subjective intuition, it is prone to disagreement as to which theorems can be devised from constructs, which undermines the intuitionist mission.

2.3 Formalism

Formalism (pioneered by Hilbert) has the aim of codifying mathematics into formal language and symbols. In reducing it to first-order language, where the syntax is standardised, it can then be studied, even if concepts of mathematics are fundamentally abstract. Therefore, formalism attempted to prove that theorems in classical mathematics are free from contradiction and as a result are consistent through using this first-order language.

Not only was this extremely difficult — the Hilbert program could not even prove the consistency of Peano Arithmetic axioms in Peano Arithmetic — Gödel eventually proved that such an attempt was futile. His first incompleteness theorem showed that for any formal system *F*, there exists a Gödel sentence *S* that "*S* cannot be proved within *F*". If the Gödel sentence is proven to be true, then the formal system has a contradiction and is hence inconsistent; if the Gödel sentence cannot be proven to be true, then the formal system is incomplete. Even if we define a larger system *F'* which consists of *F* and *S* as an axiom, this system is also vulnerable to its own Gödel sentence. Therefore, in any system there will be statements which can neither be proved or disproved in its own language. Gödel also proved in his second incompleteness theorem that the consistency of any arithmetic system cannot be proved in the language of said system. This was a huge blow to the formalist movement, for a consistent proof of mathematics which Hilbert was seeking is impossible. This also affected logicism similarly, since logicism aimed to define the natural numbers in the language of logic. Hence, the bedrock of mathematical knowledge still remains highly unstable.

2.4 Platonism

The final important group of theorists with respect to the foundation of mathematics are the platonists. Taking inspiration from the Platonic Forms, they argue that abstract mathematical entities (such as those of numbers and sets) exist independently of us, and form the basis of mathematical knowledge. The strongest argument for the existence of such abstract mathematical objects is the Fregean Argument, which is as follows:

(i) A sentence cannot be true unless its sub-expressions succeed in doing what they purport to do.

(ii) Many true mathematical theorems purport to refer to and quantify over abstract mathematical objects.

(iii) Many true mathematical theorems succeed in referring to and quantifying over abstract mathematical objects. [From *(i)* and *(ii)*]

(iv) Abstract mathematical objects can only be successfully referred to and quantified over if they exist.

(v) Therefore abstract mathematical objects exist.

However, there exist several objections to mathematical platonism. First, there is an argument from epistemological access, which states that mathematicians can never access the platonic realm precisely because it is nonspatiotemporal, implying that we can never prove the reliability of our belief in mathematics. This analysis still leaves the foundations of mathematics under question. Alternatively, structuralists would argue that mathematical concepts only have properties within a certain structure, and are defined within this structure. For instance, the natural numbers are defined not individually, but by its arrangement in a sequence and its position in the set. Therefore, the structuralist argument posits that mathematical objects are not abstract and independent, defeating the platonist position.

2.5 Implications for Mathematics

The fact that there is no way to prove the certainty of mathematical foundations came led to a crisis of mathematics. However, this is not as bad as it really seems. For one, formalism was somewhat successful in proving the consistency of essentially all mathematics, even though it cannot prove the consistency of *all* of mathematics — this was done through analysis of Zermelo-Fraenkel set theory with the axiom of choice in first-order logic.

Even if this endeavour was unsuccessful, mathematics does not face such a serious problem since most fields of mathematics do not work from axiomatic systems, and presuppose that the axioms are consistent. Note that this is a fair assumption to make, because (i) it could be the case that axioms are consistent even if we cannot prove that they are (ii) the reality that we have not discovered that our axioms are inconsistent even after millennia of research implies that it probably is very consistent. Any mathematical knowledge that we arrive at is merely prefaced with an understanding that it is under the assumption that the axioms are true. This assumption cannot always be made (in fields such as logic, category theory etc. which deal with the very axioms themselves), but can be made for most of mathematics.

There is a final implication on mathematical progress. While it might seem to be the case that Gödel's Incompleteness Theorems would mean that we should not continue doing research (since we can never truly arrive at a complete and consistent mathematics), this is false. In reality, all he says is that it can never be consistent and complete simultaneously, but not how many unprovable statements exist and what these statements are. Therefore, we can and should continue to conduct mathematical research, since we do not know if problems like the Collatz Conjecture can be solved or not. Even if we do not solve it, we can derive new techniques that can go toward solving other problems in mathematics.

3 RELEVANT QUESTIONS IN MATHEMATICS

Apart from questions regarding the foundations of mathematics, there are also other relevant philosophical questions in mathematics that have been hotly contested. They range from questions about the nature of mathematical knowledge, to how we arrive at mathematical knowledge.

3.1 Dependence on Experience

3.1.1 Mathematics as *A Priori*

The *a priori*, rationalist position about mathematics is held by the platonists, logicists and intuitionists. This is the intuitive viewpoint of mathematics; that as long as we think long and hard, we can arrive

at mathematical conclusions irrespective of our experiences or such mathematical properties having been demonstrated before.

3.1.2 Mathematics as *A Posteriori*

Philosophers such as J.S. Mill, Quine and Putnam hold the view that mathematics is empirical in nature. As a result, it is learned through experiencing mathematical concepts in our world, and is not innately within us. The strongest argument for such an unintuitive position is the indispensability argument, which begins by stating that mathematics is indispensable to all empirical sciences. If we want to believe in the reality described by the empirical sciences, then we have to believe in the reality of mathematical entities which make the empirical sciences possible. Note that we can only verify the existence of mathematics through science and our observation of real-world phenomena via our experience. Therefore, mathematics is presented as *a posteriori* as well as contingent, where all humans begin *tabula rasa* and gain mathematical knowledge after experience.

However, critics argue that an empirical view of mathematics strips it of its special and distinct nature, which cannot be attributed similarly to the sciences. Given that we accept mathematics as unchanging and definite, it cannot be the case that such properties are proven through less-certain science. Furthermore, philosophers aim to take down the indispensability argument by challenging its premises. Some try to show how mathematics is not necessary for the construction of the sciences — Field tries to construct the sciences in a nominalistic language devoid of reference to numbers or sets, instead using physical objects as anchors. On the other hand, Chihara tries to use modal construction and open sentences to construct true mathematical statements, even if mathematics does not exist ("It is possible for 3 to satisfy the condition of being a prime number" is true even if numbers are non-existent). In addition, Field tries to show that even if mathematics is false, it can still be used to describe phenomena as it expedites the meaning-making process; an explanation independent of mathematics exists regardless.

3.2 Origins of Mathematics

3.2.1 Mathematics as Discovered

Perhaps the strongest arguments in favour of mathematics being something that is inherently real is the observation of mathematics' practicality in our world. First, Wigner suggests that mathematics is unreasonably effective in explaining how the world works. For instance, the number of petals, sepals and seeds in a plant are typically taken from the Fibonacci sequence. The ability to describe and find mathematical concepts in nature therefore implies that it likely exists, and is inherent in the real-world. Second, mathematics is (at first glance) free of contradictions, which is not possible if it were constructed by error-prone mathematicians. Third, mathematics can be used to describe and predict real-world phenomena accurately, even as mathematics was initially conceived for no particular reason (some examples of this are complex numbers finding practical uses in describing waves and quantum particles). Therefore, mathematics has to be already present in our world, and working perfectly; it cannot be invented. Fourth, the indispensability argument can be used here to show that mathematical objects have to exist. Finally, one can claim that different civilisations had similar conceptions of numbers — Pythagorean triples were independently discovered by Greek, Egyptian, Chinese and Indian civilisations. In this case, it seems unlikely for mathematics to be invented (since if that were the case, then different groups of people would arrive at different mathematical statements that they find to be true).

However, the biggest problem for this position is explaining how we are able to discover mathematical concepts. This is especially the case since concepts like perfect circles and i do not exist naturally in

reality, making it difficult for us to become aware of them. It is possible to argue in support of this position nonetheless, by claiming that the real world are instantiations of Forms of mathematics, and from these elements we can discover the higher concepts (i.e. the Forms).

3.2.2 Mathematics as Invented

In contrast, whose who argue that mathematics is invented posit that the world is not inherently mathematical in nature. This is because concepts such as π and i cannot possibly exist in reality, and thus have to be constructs that man came up with. Moreover, the very mathematical conventions that we utilise seem arbitrary — even if platonic forms exist, it is difficult to identify what they actually are. This is best encapsulated in Benacerraf's identification problem. Essentially, Benacerraf identifies numerous equivalent set-theoretic models of the natural numbers. For example, consider the von Neumann and Zermelo ordinals:

von Neumann ordinals	Zermelo ordinals
$0 = \emptyset$	$0 = \emptyset$
$1 = \{0\} = \{\emptyset\}$	$1 = \{0\} = \{\emptyset\}$
$2 = \{0, 1\} = \{\emptyset, \{\emptyset\}\}$	$2 = \{1\} = \{\{\emptyset\}\}$
$3 = \{0, 1, 2\} = \{\emptyset, \{\emptyset\}, \{\emptyset, \{\emptyset\}\}\}$	$3 = \{2\} = \{\{\{\emptyset\}\}\}$
…	…

Table 1: Two different ways of modelling the natural numbers

Given that there are an infinite number of ways to generate the natural numbers, and they are all equivalent, which of these we choose ultimately seems arbitrary. If there is one that is supposed to be the 'true form' of the natural numbers, we clearly do not know which one it is. Mathematics is therefore not discovered, but invented as a tool to understand the world (e.g. in science).

The challenge posed against this position is to explain how mathematics is a consistent, functional system across cultures. The solution to this is to return to an understanding of mathematics as a deductive system which does not allow for cultural subjectivity. Even if there could be some subjectivity (e.g. in number systems), mathematics requires a common understanding from all individuals as to what the rules and axioms are (e.g. using base-10). Proceeding from these axioms thus makes no room for disagreement at all.

Another problem that proponents of this position have to deal with is how then mathematics is useful in the real world if mathematics does not exist in reality. This problem is very easily solved; if mathematics is invented in order to understand the world, then it trivially is the case that it would be extremely useful in our world. Techniques such as Fourier transforms were invented to be able to understand the concept of heat transfer, for example, and constants like e were created for various uses ranging from exponential growth to calculus.

3.3 Computers and Mathematics

The use of computers in the field of mathematics is somewhat of a contentious issue. In the past, it used to be controversial when computers were used to generate mathematical proofs. One such example of this is the four-colour theorem, which was the first to use a computer to check all 1834 subgraphs for whether they can be coloured using no more than 4 colours. The controversy during the time was due to the belief that mathematical proofs should be completely understood and verified by humans. However, this need not be the case if computers are merely executing commands from

humans, and are applying the same methods as humans would otherwise do, only doing it much faster and more reliably. Notably, the kinds of proofs that can use this form of computer verification is especially limited — computers have generated trillions of non-trivial zeros of the Riemann Zeta function and all of them have real part $\frac{1}{2}$, but that is insufficient to conclude that the Riemann Hypothesis is true.

More recently, there have been attempts to try and use computers to verify human proofs, or even generate new proofs of unsolved theorems. However, this is contentious since they do not require any human input, and (especially in the case of opaque neural networks and artificial intelligence) we have no clue how to verify and understand these proofs. Whether or not we accept these proofs depends on our trust in computers and/or our ability to verify the proofs made by computers.

3.4 Intuition and Number Sense

An aspect to consider in mathematics is the use of non-logical faculties in generating mathematical knowledge, such as our intuitions. Our intuitions can play a part in forming the foundations of mathematics (as highlighted by Intuitionistic mathematics), but it cannot be all there is to it. This is because there is no way to guarantee that our intuitions are reliable — our minds can be wrong, especially when we are expected to make quick calculations in a short period of time (and easily demonstrated in how we fall victim to Base Rate and Conjunctive Fallacies). However, they can be reliable in generating an understanding of fundamental mathematical concepts such as the natural numbers, since we do know what they are even without knowing of their set-theoretic definitions, and they are essentially universal understandings.

Moreover, intuitions play a role in the generation of mathematical knowledge. Given how mathematics proceeds in logical steps, intuitions can give us the direction in which we proceed with inquiry. Without it, we have to pursue an infinite number of possible options (and failing) in order to actually arrive at a legitimate proof for a theorem. Perhaps it is this quality of intuition that separates the layperson from great mathematicians; both can rationally think about a problem, but the greatest mathematicians have exposed themselves to a wide variety of techniques and thus have a good sensing of what forms of arguments work in proving a certain claim (e.g. whether one should try and construct a counterexample, or whether one should prove a claim by contradiction).

RAFFLES INSTITUTION
KNOWLEDGE AND INQUIRY 2022

CHAPTER 4: SCIENCE

1 INTRODUCTION TO SCIENCE

Science is the study of the natural and physical world. The objective of science is to deduce certain rules and generalisations about our world, which we can then use to improve our lives — one such example is electricity. In the status quo, scientific knowledge is accorded a high degree of rationality and certainty, as it is perceived to be achieved through rigorous and reliable methods.

Scientific knowledge requires an extremely high degree of certainty. This is because we use science in our everyday lives for practical outcomes, ranging from the invention of new technologies to sending people to the moon. In order to accomplish this, we need to be very sure that our knowledge is correct; if it were wrong, there is no way that we could achieve any of these with confidence. However, absolute certainty cannot be reached in science because of the problem of induction (which will be expounded on later). Since science studies real-world phenomena, we will have to rely on instantiations of phenomena to make generalisations and arrive at theories and laws.

2 THE DEMARCATION PROBLEM

In science, the demarcation problem is a question of how to differentiate between science and non-science. In so doing, we can then tell which beliefs we have epistemic warrant for. Of course, this would require us to deeply consider what it means for something to be 'scientific'.

2.1 Verificationism

Verificationism is the doctrine that statements which can be empirically verified are meaningful, and considered to be science. Hence, any metaphysical statements or statements of morality and aesthetics cannot be the object of scientific study insofar as they cannot be experimentally assessed. Notably, it is acknowledged that there is a need for logic in linking various empirical observations together to form a cohesive theory — verificationism is a branch of logical empiricism.

In the modern-day, such verification is done through the use of the Scientific Method. This method comprises of four distinct stages: Observation, Hypothesis, Experimentation and Verification. A scientist first observes a phenomenon, and based on observation inductively formulates a hypothesis to explain it. The hypothesis is then tested based on carrying out experiments, measuring and confirming deductions drawn from the hypothesis. Based on the experiment, the hypothesis is then refined (or eliminated) until it is accepted as scientific knowledge.

In the abstract sense of verificationism, it seems self-defeating at first inspection. After all, its theory states that meaningful statements are either analytic or verifiable. However, ironically the statement defining verificationism itself is neither analytic nor verifiable, making verificationism itself a meaningless statement if applied to itself. Carnap tries to resolve this by arguing for a principle of tolerance, where all philosophical positions (which aim to restructure the language of science) are equally tenable. Hence, whether proposals are accepted is a matter of practicality, of which verificationism possesses a great amount, because it can be easily tested in the court of public experience. Therefore, the language to describe verificationist theory (which describes the language of science) is not subject to itself.

When it comes to the scientific method, there are numerous critiques which prove that it is difficult to properly verify claims objectively. For one, the observation and experimentation segments are subject to observational and experimental error respectively. This means either that the scientist has failed to

account for other factors in the experiment or observation, and as a result draws incorrect conclusions. If an experiment does not solely account for a single independent and dependent variable, then external factors will ruin experimental results. Experiments are also subject to confirmation bias, where information is interpreted in a way which favours already established results or hypotheses. This is why scientists initially observed that the head of a sperm resembled a tiny man — they had preconceived notions of preformationism which were confirmed by their subsequent observations.

Furthermore, verificationist theory is plagued by underdetermination of scientific theories. Such underdetermination occurs in two separate forms: holist and contrastive underdetermination. Holist underdetermination is best encapsulated in the Duhem-Quine problem, which states that theories cannot be tested in isolation from other underlying hypotheses and assumptions. We can only derive expected empirical observations through assumptions and beliefs about our reality and science. Therefore, evidence alone cannot prove the falsehood of a new theory — part or all of our existing beliefs and assumptions could be wrong instead. In contrastive underdetermination, empirical evidence is insufficient to differentiate between competing theories, making science uncertain as we cannot know which of the theories are correct. Such underdetermination comes in two forms, which are weak and strong underdetermination. In the former, differing theories are indistinguishable until new information arises. For instance, this would have been the clash between Copernican and Ptolemaic (heliocentric and geocentric) systems of our world. In the latter case, no possible evidence can be provided which helps us decide between two rival theories. Clearly, this underdetermination would make the certainty of the scientific method untenable.

Finally, it is possible to argue that there is a problem of induction at play here when you generalise scientific laws and principles from specific instances of experiments. This is already covered in the chapter on Humean scepticism, but can be briefly summarised as follows:

(a) Observations in the past might not hold in the future.
(b) Epistemic luck is not removed, hence events without direct cause can occur in conjunction.
(c) In arguing for induction it is asserted that the world is uniform and consistent, which itself is an inductive conclusion.

2.2 Falsificationism

In light of all the issues surrounding verificationism, Popper suggested the alternative formulation of science as the collection of falsifiable statements which have yet to be falsified. Under falsificationism, theories are corroborated (never proven to be true) or falsified based on evidence. This is able to bypass the problem of induction previously mentioned, because science does not rely on inductive logic. Instead, counterexamples disprove theories by way of Modus Tollens argument, which is deductive. Any theories which do not fall as a result of evidence are strengthened, but not definitively proved to be true. This appears to account for how theories change over time — new information disproves theories which have less explanatory power. The implication of this is that science is a game of trial-and-error, where elegant solutions to encapsulate all of scientific observations are sought through problem-solving.

However, it is important to point out that falsificationism does not seem to avoid the issues brought about by the Duhem-Quine problem. We are therefore still unsure if new theories that we develop and test are wrong, or if our current knowledge and assumptions are at fault. Expanding upon this idea, this is perhaps indicative of a larger issue of theory-ladenness. This occurs on two separate levels. On one hand, the observational terms used are determined by theoretical presuppositions, while in the other observation is influenced by the theories of the scientist. Therefore, any

observations made cannot be neutral; our concept of the colour red contains our individual biases of colour perception (be it in our semiotic description of redness or of personal experience), which then infringe on our observation of something as being red. On the other hand, observations and experiments cannot be separated from its theoretical underpinnings, making it difficult to ascertain truth.

A further criticism of falsifiability is that it would seem counterintuitive for science to exist without induction. After all, science seems to arrive at universal laws which are commonly accepted, even as there are other potentially competing theories. The issue at present is selecting between the various available theories to conclude at a single accepted theory. Popper claims that this is arrived at through the process of corroboration and falsification, as detailed above. Nonetheless, this process to arrive at universal laws unfortunately cannot be made rigorous, since theories can never be verified to be true.

2.3 Kuhnian Scientific Revolutions

Kuhn seems to agree with the fact that science is theory-laden, and that we can never perceive things in an objective manner. Therefore, Kuhn argues that science is comprised of 'normal' and 'revolutionary' periods. In 'normal' periods of science, scientists solve science like a puzzle, using the theoretical and physical tools at their disposal to understand the world. However, scientific revolutions arise when the innovation of scientists comes into conflict with their conservativeness to remain with current theories. This means that there are a large number of unresolved anomalies within the current theory, causing a scientific crisis. In response to such crises, Kuhn posits that a paradigm shift occurs, where a new disciplinary matrix of understanding the world arises. Differing from Popper, this paradigm shift does not occur on any methodology or process; rather it is random and is essentially a leap of faith. From one paradigm to another, therefore, science need not maintain all of its theories from the previous paradigm.

Crucially, Kuhn notes that all paradigms are incommensurate to each other. This means that there is no set of criteria to which we can objectively compare paradigms to each other. After all, we all exist within a paradigm of its own values and frameworks. Making a value judgement between two contrasting paradigms is therefore affected by our own paradigm. More specifically, it is affected by the following:

(a) Our current methods for comparison and evaluation.
(b) Our own observations, which are influenced by theory.
(c) Our current semantic structures, which change in meaning over time.

Under this regime, it is clear that scientific progress is argued to be not as straightforward as alternative theories of science. Instead of progressing linearly, the various paradigm shifts make it such that scientific change is non-rational and directionless. Within paradigms, however, there is a clear progress since the same theory is being used to devise scientific knowledge. A further analysis of paradigm shifts will reveal that paradigm shifts are not as radical as Kuhn implies — most of the time, previous theories and explanations are subsumed under the new paradigm. For example, the transition from the Continental Drift theory to a Tectonic Plates theory in geology maintained the explanation of the Earth's continents by the former theory, merely adding new mechanisms to explain other phenomena. At the same time, some theories from previous paradigms are still applicable within a new paradigm. Newton's laws of motion are still taught and used in spite of its failure to account for relativistic motion (as Einsteinian mechanics does); Bohr's model of the atom is still taught even

though we now are in a quantum paradigm of particle physics. Therefore, there is scientific progress as our theories constantly aim to account for more scientific phenomena.

The latter example actually seems to suggest that truth in science is not black-or-white, instead operating on degrees. This in turn will lead to a pragmatist conception of truth in science — as long as a theory is sufficiently applicable in explaining and predicting phenomena, it will be granted truth. This seems to be the case, given how at best we can only approximate and guess what the laws of nature are from observing reality.

3 EXISTENCE OF SCIENTIFIC ENTITIES

Regarding the question of whether scientific entities exist, this is a reframing of the classic "Discovered vs Invented" debate. In the philosophy of science two positions are argued, namely the realist and instrumentalist positions.

3.1 Scientific Realism

Scientific realism is the position that the entities that science considers are real and that science can say true things about them. This means that both objects that we can observe without aid and unobservable objects exist. More specifically, scientific realism necessarily entails the following three commitments:

(a) *Metaphysical commitment:* The world as investigated by the sciences is mind-independent.
(b) *Semantic commitment:* Theoretical statements can be taken at face-value, and have truth values.
(c) *Epistemological commitment:* Theoretical claims constitute knowledge of the world.

There are several arguments raised in favour of such a position. First is the No Miracles Argument, which begins by claiming that the best theories of science are extremely successful. Therefore, this success arises either because such best theories are true (and correctly describe a mind-independent world of science) or their success is a miracle. Given the two options, we are inclined to accept the former explanation, proving that science exists.

Notably, there are several criticisms of the above argument. Intuitively, it is possible to raise counterexamples of theories which are successful but are now considered to be wrong. For example, the caloric theory of heat was successful in explaining heat transfer, but we do not claim that the self-repelling caloric exists. The key unaided observation remains, and is not under question; but it is the unobservable concepts which are not verified to exist. Furthermore, the No Miracles Argument seems to fall victim to the base rate fallacy. This means that we do not know the rate of successful scientific theories being true as compared to the rate of false positives (where false theories are largely successful). The lower the rate of successful scientific theories being true, the greater the chances of a successful theory being a false positive. Given that we cannot know the base rate, therefore, it is argued that using success as a metric for truth is unjustified, as we cannot compute the chances of a theory being true.

In a similar vein, there is an argument about corroboration. This means that various (independent) scientific endeavours have provided proof of the existence of the same unobservable entities, therefore they exist. For instance, light microscopy and transmission electron microscopy both show

that platelets exist, even as the theory each equipment relies on is different. Therefore, it is corroborated that unobservable scientific objects exist.

Finally, there is an argument from pragmatism. This argument posits that for science to progress, theories have to have genuine conflict. However, this conflict can only arise if unobservable things exist. If not, all theories would be equal, with no way to break the tie between them, making progress impossible and futile. This goes against the very purpose of science. However, such an argument is easily refuted by stating that science could be made up of paradigms, which break the deadlock between theories.

3.2 Scientific Instrumentalism

In contrast to scientific realism, scientific instrumentalism is the view that all unobservable entities are fictions which are used to predict the behaviour of observable entities — statements about the unobservable therefore have no literal meaning. Nevertheless, they still play a key role in discovering observable phenomena. Just like how past theories scaffold for new forms of observational and experimental knowledge, but eventually are discarded in place of more rigid theories, current theories also can be rejected once they serve their purpose.

The most important argument in support of scientific instrumentalism is that of underdetermination. That is to say, given that for any set of observations it is possible to come up with more than one theory to explain it, it is unfair to claim that one theory in particular is true. They point to examples in history where theories are rejected as false, and the unobservable entities claimed within to be non-existent.

The response by the realists would be to argue that while underdetermination is true, some explanations are better than others. They use an Inference to Best Explanation, using metrics of simplicity, cohesiveness or predictive power. Such a technique is actually common in scientific inquiry — when faced with an unexpected orbit of Uranus, the better explanation was not to entertain the thought that Kepler's laws of motion were false, but to posit the existence of another planet (this turned out to be Neptune). Simpler explanations that rely on lesser entities or logical links are taken to be more likely to be true, and science as a whole strives for elegant solutions to explain how the world functions.

However, there seems to be some flaws with an Inference to Best Explanation. For one, the metrics used to compare explanations are vague and largely subjective, changing depending on individual contexts. Even if this were standardised, the best explanation might not be the true explanation if we have not considered the true explanation to begin with, leaving us with the best amongst bad options.

Another key criticism of the above argument is that instrumentalists' argument itself is susceptible to underdetermination, making it difficult to ascertain if the argument from underdetermination is the true theory in the first place. If we cannot prove that the above argument has to be the true argument for understanding science, then we cannot possibly apply this framework to the rest of science.

4 SCIENCE AND THE SCIENTIFIC COMMUNITY

Of course, science is not an individual endeavour. Science usually requires an entire community of scientists and experts. There are several reasons for this. For one, the purpose of the scientific community is to replicate and verify results that other researchers have observed. Since science

purports to be an objective assessment of the world, any theory or law discovered should be easily replicated by other researchers — if not, this could be due to researcher error or bias. For example, mass replication of the LK-99 superconductor by various research teams across the globe serve to verify scientific findings and ensure that they can pass the threshold of scientific knowledge.

More broadly, scientific inquiry needs individuals from differing cultures and backgrounds in order to prevent the imposition of biases in research. This is notable in fields such as medicine, where in the 20th century researchers only focused on the physiology and common illnesses faced by Caucasian males, thinking that any generalisations made would universally apply to everyone else. Without much information on the biological differences between males and females, and a general lack of knowledge on diseases experienced by Asian communities (e.g. tropical diseases like Malaria), this led to a bias in medical knowledge. Having many perspectives can serve to ensure that science is free of bias, and truly generate objective knowledge.

Scientific communities can also be helpful in conducting various experiments to generate new knowledge in science. For example, the first ever image of the black hole was captured with the efforts of more than 200 scientists working together from all around the world. Without everyone's cooperation and joint efforts, this would not be possible.

Finally, the scientific community serves as a holder for collective scientific knowledge. After all, no one scientist knows all scientific claims; instead each scientist has a limited (and deep) knowledge in a specific area within science. This is reflective of how science is a social endeavour, with the benefits of science reaped by all of humanity. As long as a few individuals within the community hold certain knowledge, we as a community can then combine this knowledge to progress mankind (e.g. sending man to the moon with specialists in rocket propulsion, materials science, microgravity physiology etc.). The power of science lies not on an individual level, but in the ability to combine efforts and accomplish these feats.

RAFFLES INSTITUTION
KNOWLEDGE AND INQUIRY 2022

CHAPTER 5: SOCIAL SCIENCE

1 INTRODUCTION TO SOCIAL SCIENCE

Social science is devoted to the study of societies and the relationships between individuals of various societies. It contains a broad range of disciplines, ranging from more scientific disciplines such as Psychology or Economics, to more socially oriented fields of study such as Anthropology. Therefore, there will be a wide range of techniques used to gain knowledge in the field (as explored in the later sections).

In the social sciences, the degree of certainty required is not as high as that of the natural sciences. This is because there is an understanding that the subject of study (humans and their societies) are complex creatures with a significant degree of free will. Any claim that is made in the social sciences cannot be said to universally apply to all subjects (as would be the case in physics, for instance, which operates on deterministic laws). At best, we can only prescribe probabilities for someone behaving in a certain way. At the same time, there is no need for such a high degree of certainty — if the goal of the social sciences is to understand others or to guide decision-making, then there is no need for predictions to be so accurate. For example, if the prediction of an economic crisis spurs the government to implement certain policies, eventually resulting in no crisis occurring, this is still a meaningful use of economics knowledge even as it did not lead to accurate predictions.

2 APPROACHES IN SOCIAL SCIENCE

In the field of social sciences, the subjectivity of the claims under investigation means that there is no consensus on how to best conduct social scientific research. Several differing approaches have arisen, each with their own merits and issues.

2.1 Positivist Social Science

Positivism is the belief that our social world operates according to natural laws which exist. Therefore, the purpose of the social sciences is to discover these laws through applying objective scientific methods to study societies and humans. This is commonly seen in fields such as Economics and Psychology, where experimentation and hypothesis-testing are common.

2.1.1 Comte's Positivism

To Comte, society evolves over three stages, first beginning in a theological stage, before moving to a metaphysical stage, and finally ending at a positive peak. As society progresses along the stages, the reliance on unobservable entities decreases, with no higher power or metaphysical concept governing the masses. In order to move between stages, there is a need for one to appreciate the past and build upon it to predict the future, creating a better society. Clearly, he argues that scientific knowledge is superior to all other knowledge due to its high explanatory and causal power. More specifically, Comte argues not only that social science is the highest form of science (as it deals with the most complex organism that is society, and can only be reached as the last of the sciences), but that it should be studied using reasoning and observation, to better understand the progress of humanity throughout time.

Notably, Comte argues that the study of society should not be isolated from theory. In order to discover the natural laws of society which determine social stability and change, one has to observe facts through using statistical tools and scientific methods. Further, it needs other theories to corroborate and establish true laws. Such theory makes it possible to analyse and connect phenomena in a meaningful manner.

2.1.2 Durkheim's Sociology

Durkheim is perhaps the person who began the academic discipline of sociology. While he disagreed with Comte's theory of societal progress, he did refine Comte's method of sociology further. He suggested two rules of the sociological method:

(a) Sociology must have a specific object of study. In this case, it refers to *sui generis* social facts.
(b) Sociology must use a recognised objective scientific method to bring it as close to other sciences as possible.

In this sense, Durkheim relies on scientific evidence to reveal how society truly works. Through the scientific method of studying social phenomena, we can quantify various aspects through statistical testing and experimentation. This data then allows us to identify correlations between variables and establish cause-effect relationships. Similar to the scientific method, these experiments should be able to be replicated and verified by other researchers. In so doing, we are able to determine whether a society is healthy or is pathological in nature, and seek social reform to mitigate the issues.

2.1.3 Criticisms of Positivism

Nevertheless, there exist certain criticisms of positivism. For one, it is unclear if social facts truly exist. After all, the basis of universal laws for humanity is that humans are predictable. This might not be true given that humans are thinking, observing and evolving creatures who sometimes act in unpredictable ways. The variety of humans are also too diverse for a universal law about them to be possibly determined. There also exist limitations in the ways that social phenomena are captured in this endeavour, as abstract concepts (such as happiness) are subjective and dependent on the individual, making it difficult to quantify.

When trying to conduct experiments within the context of social scientific research, it is also difficult. For one, some forms of experimentation are simply unethical or controversial — we would not allow babies to be tortured at a young age to determine whether it has an effect on their psychological development. Moreover, some forms of experimentation are also impossible to carry out. For example, one cannot possibly subject everyone in the world to an experiment to determine whether the Law of Demand holds. It is also impossible to directly conduct experiments when dealing with young children, who cannot respond to language in the same way as adults. Any hypothesis tested by the researcher is also prone to factors such as confirmation bias which may be inadvertently present during experimentation. Experiments can also be flawed due to the Hawthorne effect, where individuals change their behaviours when they are aware that they are under observation. Finally, there is the possibility of framing effects in certain instruments such as surveys, which lead to slants in results (e.g. in the language used to ask questions in surveys).

Even if we assume that the experiments are feasible and objective, there are a wide array of tools that researchers can use to analyse data. Researchers even have the liberty of choosing what data points to include or exclude, and whether or not to regard some data as anomalous. This is where the subjectivity of the researcher becomes intertwined with social scientific research — when 29 research teams were given the same data and were told to conclude whether dark-skinned players were more likely to receive red cards, the results ranged from a negligible difference to being almost 3 times as likely.

Nonetheless, it seems that positivist endeavours can produce knowledge claims in the social sciences. Even if we do not know that all individuals follow the Law of Diminishing Marginal Utility, it still seems

to be a law that is obeyed on aggregate (i.e. by all members of society). As a natural part of epistemic progress, however, it is under question whether some of the results we discover are actually universal laws, or merely flawed generalisations or experiments.

2.2 Interpretivist Social Science

In contrast to positivist social science, interpretivist social science proposes that the social sciences cannot be studied using the same methods as the natural sciences. Instead, there is a need to focus on the value and meaning that individuals assign to social interactions. In so doing, they choose to avoid the objective scientific method, preferring qualitative data instead.

2.2.1 Verstehen

Verstehen (German for 'understanding') is the concept of understanding the meaning of action from the individual's point of view. After all, human nature is complex and subjective. This means that objective reality is but an ideal for science. Hence, rather than believing that an objective lens exists from which to view social scientific phenomena, it is preferable to subjectively understand it in context to the individual. Therefore, social laws do not constitute knowledge of our social reality; it is merely an aid for the mind to achieve such knowledge.

The German philosophers believed that the methodology of social scientific research is to undergo comparative historical analysis in order to understand why a certain outcome was the result of various historical processes. More specifically, this is done through Weber's conception of 'ideal types'. Broadly speaking, ideal types are generalised categories to which we can compare social phenomena against, in order to better understand it. These ideal types do not have to exist, and merely describe the typical course of action for an individual, accentuating common elements of a phenomenon. This allows us to measure similarities and notice differences in concrete occurrences, and ascribe precise meaning to our world. Interpretation to Weber therefore is the classification of behaviour as belonging to some ideal type. Crucially, Weber is aware of the subjectivity that exists, and does not claim for any ideal type to be objectively true — multiple ideal types can exist, and their purpose is only to provide adequate comparison with phenomena.

2.2.2 Symbolic Anthropology

Symbolic anthropology is similar to Verstehen in that it focuses on the study of subjective individual meaning-making processes. However, instead of understanding it directly from the perspective of humans, symbolic anthropologists employ a semiotic approach; they turn to cultural symbols, generalising from them the values and characteristics of a particular community. This way, we are able to converse with others in their culture and gain a better appreciation for their world.

For Geertz, symbolic anthropology has to be carried out through 'thick description', which accounts not only for the physical behaviours and practices, but also the context as interpreted by the individual actors, allowing an outsider to understand from an insider perspective. Of course, this necessitates a significant amount of interaction with the community under study — Geertz himself was known for living the lives of the communities of interest for prolonged periods of time to get himself used to the context and cultures of the community. Margaret Mead also spent time in Samoan society in order to understand their culture and how they perceive growth and adolescence.

2.2.3 Criticisms of Interpretivism

Perhaps the biggest issue of interpretivism is that qualitative data is not perfect, as it is unknown how subjects change in response to being scrutinised or observed by a researcher. Of course, a similar

problem occurs in positivist social science, but it is far more mitigated through the use of aggregated data and objective means of measurement. There is also subjectivity as to what an observer notes to be of importance, which drastically affects the quality of data and the conclusions drawn from such data. Finally, it is difficult to ascertain whether what a researcher says about a society is true, precisely because interpretivists work within the frame of cultural relativism and subjectivity. The implication of this is that knowledge gained via interpretive social sciences can hardly be considered as certain, and even if it was certain, the knowledge is only provisional since meanings and values constantly change within a society.

2.3 Critical Theory

Critical social science is a process of inquiry which goes beyond surface illusions to uncover real structures in the material world. With such knowledge, people have the ability to change society for the better. Such social scientists believe that positivist social sciences are far too narrow and non-humanist in their treatment of social issues (much like interpretivism), but also maintain that the interpretivist social sciences are far too localised and subjective, rendering it passive and meaningless. Given this, the value of critical theory lies in its ability to spur social progress.

Critical social scientists hold a critical realist ontology. According to Bhaskar, this means that reality is composed of several layers: the Empirical, the Actual and the Real. In the Empirical, we observe phenomena using our senses. This is a subset of the Actual, which encompasses all events that occur, independent of our experiencing them. In turn, this is a subset of the Real, which contains structures that act to create phenomena that we experience. Given the varying levels of phenomena, it would not make sense to conflate all of them together — but this is exactly what is being done in most social sciences basing conclusions on experience.

2.3.1 Truth in Critical Theory

Given that the end goal of this endeavour is practical change, its truth is only assessed insofar as critical social scientific theories are applied to the real-world. If the critical praxis is able to bring about the desired forms of change, then it is a good form of knowledge. Utility therefore being the only point of consideration, there can be multiple approaches to account for the same issue. This means that theory (and the values that one imparts into research) serves as an inherent starting point for critical research to occur. Some positions are right, and others are wrong, but right and wrong are individually determined by the researcher undergoing study.

However, the above understanding can come across as problematic. This is because erroneous knowledge can lead to desired practical outcomes by chance or otherwise. For instance, Freud's psychoanalysis was somewhat effective in helping people with mental instability, but most psychologists and psychiatrists reject his theories (the reason for this is because it is completely unscientific and unverifiable). Furthermore, the standard for justification is highly uncertain — what is the threshold for enough practical change, and how do we measure it? Finally, there is great difficulty in comparing between incommensurate theories which account for the same phenomena, as both might point to the same practical action being taken for social change.

RAFFLES INSTITUTION
KNOWLEDGE AND INQUIRY 2023

CHAPTER 6: HISTORY

1 INTRODUCTION TO HISTORY

History, put very simply, is the study of the past. In studying the forces, choices and circumstances of the past that have led us to the present moment, we can then have a better understanding of our present environment and how we should act within it. It might not always be possible to precisely determine what happened in the past, but history strives to do the best that it can, given the constraints it faces.

2 THE HISTORICAL APPROACH

At first glance, history might appear to be as factual and grounded in truth. This is because historical knowledge has to reference real artefacts or evidence, which is empirical justification for our understanding of history. However, there are several limitations of the historical method.

2.1 Historical Evidence

Historical evidence can exist in several forms, ranging from artefacts from a specific time-period to documents detailing events that occurred and was recorded down. From the vast amount of historical evidence available, historians draw logical conclusions to get an understanding of past historical events. Despite this, all historical evidence, being made in the past, is limited in providing us a clear understanding of the past. This is because information is inherently lost over time — intricate details of art can fade away; records can be entirely lost. Therefore, the paucity of our records forces historians to make inductive leaps or Inferences to Best Explanation, which might not necessarily be true. One very prevalent example of this is the recently released Albatross Files, which seems to go against the narrative of Singapore being kicked out from Malaysia, instead leaving as the result of a planned negotiation. Because there is such a large amount of evidence that we have yet to discover (and we do not truly know when we have discovered all available evidence), how are we to trust the inferences that we make about the past based on limited evidence that we currently have?

The link becomes even more tenuous, when people of the past are able to select artefacts or knowledge to be preserved. For example, most of Egyptian and Greek history documented the lives of the powerful and upper-class (Pharaohs and Kings), but little evidence can be found with respect to how the slaves or peasants in these empires lived. Precisely because individuals of the past do not know what people in the future would consider to be historical facts, they make their own judgements, which excludes information. Information such as photos can also be manipulated in order to suit certain agendas of individuals. Using such evidence to draw conclusions therefore runs the risk of omitting certain groups of people from historical inquiry (perhaps constituting some form of epistemic injustice), as well as downplaying their significance within ancient societies in the same way that those in power did.

2.2 Historical Subjectivity

History is more than just the gathering of facts to describe the past; the main job of a historian is to explain and interpret the past in a way that goes beyond the facts. Hence, facts are weaved into causal narratives that explains how and why events occurred. Such a process lends history its predictive and explanatory power. This comes into conflict with the reality that the past is complex and ambiguous — there is rarely a sole motivation for an individual to perform a certain action, and the causal links between events and unclear and often tenuous. As a result, there is likely to be several biases at play on part of the historian that influences his research.

2.2.1 Hindsight Bias

Hindsight bias occurs when historians have the benefit of knowing exactly what happens after a particular event in the past. Such an understanding distorts their understanding of the event, since they see it in a way which is different from a historical actor living through the event. This bias therefore makes it likely for historians to misattribute causes or motivations of an individual. One such example is that with the benefit of hindsight, we can easily see how communism in the 20th century was bound to fail, when in reality it was a popular option of governance.

The solution, as argued by Collingwood, is to step into the shoes of the historical actor and re-enact their thoughts. In so doing, we are able to understand their motives and reasons. However, this seems to be problematic insofar as empathetic understanding is limited; intuitively, the average person can never understand what it is like to think like Hitler or Stalin. There are also significant differences in cultures and contexts between the past and present, making it difficult to accurately represent a character in the past. Additionally, although historical sources are from the past, it is read in the present. This means that we imbue our own contemporary methodologies, values and concepts into the past, making true interpretations of the past difficult to reach. Presentism in history therefore makes history subjective. As our own value systems change, the ways that we see people of the past inevitably change.

2.2.2 Problems with Selection

For any form of historical knowledge to be gleamed from evidence, a research topic or perspective has to be chosen by the historian. Depending on the lens that a historian uses to view the past (be it through an economic or a cultural perspective), the historian would come up with hypotheses about the past, and try to use evidence to support or falsify the claim. Historians, in selecting which evidence is appropriate to use, also make judgements which are inherently subjective. Ostensibly, historians are perhaps not able to make value-free interpretations about the past. For example, historians in the past were preoccupied with Western narratives of colonialism and conquest, and only focused on history as seen from the perspective of the West. Yet, current historians are more concerned about uncovering hidden narratives that exist alongside such dominant narratives, thus leading to various forms of revisionist history with respect to colonialism. As times change, the ways that individuals engage in the creation of historical knowledge also change.

2.2.3 Other Influences

There are also other factors which influence the ways that individuals see the past. For example, one's own upbringing can influence the ways we see history. Consider how Japan never really claimed responsibility for WWII, and as a result its people view it as something that was bad, but inevitably out of their control. This is unlike Germany, which actively acknowledges responsibility for the atrocities committed, and leading to a more conventional understanding of WWII amongst its population. Paradoxically, it is precisely the need to influence individuals in a certain way which prompts governments to select a particular interpretation of history over others. This is because he who controls the past controls the present; individuals use history as a means for understanding their society. This is why Singapore's past is framed by the government as the rapid development of a sleepy fishing village into a bustling metropolis over a single generation, instead of other narratives.

Finally, there exist inherent subjectivities in language. When describing history, the connotations of language are rarely neutral, and can have an implication on the ways in which we view history. For example, describing the Rohingya crisis as a massacre makes the situation seem dire, while framing

it merely as a conflict downplays the severity significantly. Historians implicitly frame others to see the past in a certain way based on how they write.

2.3 Truth in History

Given the above criticisms, what then is truth in the field of history? Perhaps trivially, truth cannot be identified through correspondence — until we invent the technology to undergo time-travel, we are incapable of accessing events of the past. Truth therefore has to be determined via coherence, where the more a claim coheres with other historical claims and historical evidence, the truer it becomes. This accounts for the way that we view truth in history as non-absolute; there are claims that we perceive to be undoubtedly true, while others seem a bit more tenuous.

However, determining truth through coherence might lead to the formation of diametrically opposing but internally consistent webs of knowledge (e.g. Holocaust deniers versus most other people). Since both cannot be true at the same time, distinguishing between the two requires us to compare the web of beliefs on some level. Regardless of whether we are using Comprehensiveness or some form of Occam's Razor to determine which web is more true (and other metrics might also be valid), it seems that Holocaust deniers do not have a significant case — their web can account for less evidence in the real world, and even when they do account for it do it inelegantly.

Nonetheless, I posit that it is possible for multiple truths in history to arise concurrently in certain cases. This does not refer to an idea where the Holocaust happened and did not at the same time, for instance. What I am referring to pertains specifically to judgements of causes, intentions and effects in history. I find that this is a legitimate claim to make given the complexity of our past and of human behaviour — that there can be more than one cause to any event, and people can act based on a combination of intentions. Even then, if the purpose of studying the past is for us to learn from it and improve ourselves as individuals and societies, then maybe we do not need to preoccupy ourselves with finding a singular, definite way to interpret history — we view the past with the lens of the present, and this is alright in guiding our future actions. Therefore, as long as an interpretation of motivations, causes and intentions can be supported by a significant amount of evidence, and it does not directly contradict other claims in the field (with evidence being the unmoving pillars), then it could be accepted as a possible interpretation.

3 THEORIES OF HISTORICAL KNOWLEDGE

Ultimately, the value of history is determined by one's view of whether history is able to give us an understanding of the past. There are several distinct viewpoints on this issue, leading to several theories of historical knowledge. This ranges from idealistic reconstructionism the bleaker perspectives of deconstructionism, with constructionism as the middle ground between these two theories.

3.1 Reconstructionism

Reconstructionism was the traditional approach to history produced in the wake of the Enlightenment. They maintain the viewpoint that the past can be objectively studied and understood as it is through history. This was the traditional approach to history produced in the wake of the Enlightenment. Such an approach is similar to naïve realism. Individuals who believe in reconstructionism believe that history therefore can be discovered. In order for history to be discovered, they also have to stand for the existence of a mind-independent past. Hence, any historical truth that we derive is an accurate

representation of the past. Historians' accounts might be tentative or contain mistakes, but the end goal still would be to find the historical truth that corresponds to the past.

Given such a belief, the role of the historian is therefore to be objective and contextualise evidence to the event of study. This is a belief held by historians such as Ranke and Elton, with the latter claiming that historical reconstruction should be grounded in an independent security, isolated from subjective factors such as one's background. This has to be done through including as little interpretation as possible, which Ranke argues can be done through relying on primary sources. Using such primary sources, historical explanation will emerge naturally and simply through contextualisation — even if history is still constructed in the form of a narrative, such narratives merely form the vehicle for the telling of history, and is secondary to the actual story being told. Implicitly, they believe that there is only one possible rearrangement of history (what *actually* happened), and that there are no other ways to organise pieces of evidence.

3.2 Deconstructionism

On the other hand, deconstructionists argue that we can never know the ultimate historical truth, even if it existed. This is because history is interpreted and reinterpreted every time someone tries to comprehend it, based on the reader's own values and knowledge. Even evidence is not an objective basis for historical research, but a chain of interpretation that led to the evidence (and never ends, since the historian continues to interpret this evidence). Therefore, the past is lost to time, and we can never recover the true past; the closest we can reach is finding simulacra of it. Additionally, historians can never step outside of history since we are situated as a person living within time and space. This means that the history that any historian creates is the product of various ideological forces and narrative conventions that historians abide by. As a result, history can never be objective, and we have to settle for a pluriverse of narrative representations of the past existing, with none being more correct than the other.

In dealing with history, therefore, there is a need to use analytical tools associated with literature to understand sources and historians' interpretation of those sources. This entails studying the style, genre and narrative structure of sources to uncover their meanings, rather than to try and piece sources together to form an argument. In so doing, we are able to uncover some meaning, albeit not about the past reality itself.

3.3 Constructionism

Constructionists form the middle ground between reconstructionists and deconstructionists. They reject the naïve view that a pure, detached history is attainable, while also rejecting the view that history is only a literary artefact. Hence, the conceptualisation of evidence into historical knowledge is dependent on the historian applying social, political and economic concepts judiciously. It is the combination of evidence in reality and a historian's subjective interpretation which lends history its significance.

Notably, constructionists believe that we can still understand the past as it probably was. This is because in spite of the various flaws of the inferential ability of history, historical methodology is still reliable in providing us with information of the past. Insofar as our knowledge is likely to be predicated on historical evidence, whether or not evidence coheres to these theories forms the basis as to which interpretations of history are acceptable. There could also be further criterion to determine what sorts of claims are considered legitimate (e.g. having to arrive through logical inferences), preventing

nonsensical claims from being considered historical knowledge. Given that the purpose of history is to explain concepts and narratives, there is no need for absolute certainty — such a position understands how situational and subjective history really is.

RAFFLES INSTITUTION
KNOWLEDGE AND INQUIRY 2023

CHAPTER 7: ETHICS

1 INTRODUCTION TO ETHICS

Ethics is the study of morality. The purpose of ethical study is to determine a set of rules that society deems as appropriate or intrinsically right to follow, if it even exists. In fact, there is a significant degree of discourse surrounding ethical theories, and it is uncertain which of the many theories out there are right.

There are several ways in which ethics can be studied. First, one can analyse morality in a descriptive manner, observing humans and drawing conclusions about their behaviour (as social scientists, for instance, might do). Second, we can analyse morality normatively, using argumentation to argue for and against some actions being moral and vice versa. Finally, ethics can be studied from a more metaethical lens, to determine the nature of moral knowledge and on the nature of morality. We are most interested in this last perspective of morality.

2 MORAL SEMANTICS

Before even beginning to discuss what the nature of moral knowledge is, we first need to determine if moral statements are even truth-apt. In other words, we need to verify whether moral statements (such as “murder is immoral”) are capable of being true or false. There are two distinct camps of individuals, the cognitivists who believe that moral statements are truth-apt, and the non-cognitivists who believe the inverse.

2.1 Cognitivism

Cognitivism refers to the intuitively held view that moral statements are truth-apt. This is because of the nature of moral discourse, where we use moral statements in a manner which seems to presuppose there being a truth value. More specifically, there are three conditions of moral language which seem necessary to fulfil:

(a) The meaning of a complex sentence embedding a moral claim should be a function of the meaning of its parts so as to explain how easily we understand complex sentences.
(b) The logical relations between moral claims and other judgements which embed these moral claims have to be maintained.
(c) The meaning of a moral judgement should be uniform across contexts (e.g. “Lying is immoral” in the sentence “I wonder whether lying is immoral.”).

This manifests itself aptly in the Frege-Geach problem. Consider the following argument that we might see in moral discourse:

(i) *Stealing is wrong.*
(ii) *If it is wrong to steal, then it is wrong to coerce someone else to steal.*
(iii) *It is wrong to coerce someone else to steal.*

If moral statements are truth-apt, then we easily fulfil all three desiderata. This is because the argument then takes on a modus ponens form (thus satisfying *(b)*) and the meaning of “stealing is wrong” would be consistent across *(i)* and *(ii)*. However, if moral statements are not truth-apt, and represent emotions or imperatives, then it becomes difficult to claim that the statements logically lead to the conclusion, since it is merely a disapproval of an action that should not be able to affect other attitudes. It is such an intuitive understanding of moral discourse that makes it seem that moral statements have to be truth-apt. Non-cognitivists have tried to remedy the situation, but it is difficult and complex.

2.2 Non-Cognitivism

Nonetheless, we will continue to analyse and understand the non-cognitivist perspectives. There are several reasons why different groups of non-cognitivism arose in the 20th century. For one, G.E. Moore's Open Question Argument seemed to question the existence of a universal definition for what words such as "moral" and "good" meant. More specifically, his argument takes on the following form for any property *X*:

(i) *If X is analytically equivalent to "good", then "Is it true that X is good?" is meaningless.*
(ii) *"Is it true that X is good?" is not meaningless.*
(iii) *X is not analytically equivalent to "good".*

The implication of this argument is that moral properties such as goodness are irreducible sui generis properties that have no non-moral or descriptive equivalent. However, non-cognitivists argue that this problem occurs because when we linguistically make moral statements (as in the above argument), we are not referencing moral properties (either because they do not exist, or we have no way of reaching them). As a result, it them becomes trivial that they cannot be described by non-moral or descriptive terms.

There are several forms of non-cognitivism, which will be briefly described below.

2.2.1 Emotivism and Expressivism

Emotivism is the belief that moral claims represent a speaker's affective state and might have the additional purpose to invoke similar responses in others. For instance, words such as "good" and "moral" suggest a positive emotion with respect to a certain action; "immoral" reflects a negative emotional response. Just as how a cheer or a groan cannot be true or false, emotivism claims that such moral language cannot also be truth-apt.

Similarly, expressivism is the view that moral claims are ways through which we express attitudes that are for or against a subject. Emotivism is a subset of expressivism; when we reveal our emotional states, we are expressing our attitudes toward a moral act.

2.2.2 Norm-Expressivism

Pioneered by Gibbard, norm-expressivism is the theory that moral statements refer to an acceptance or rejection of cultural mores and norms within society. This is opposed to the individual personal feelings as described by emotivism and expressivism. When we consider an action to be rational, we accept the system of norms which allow the action. Gibbard then uses such judgements of rationality to account for judgements of morality — when we claim that an action is wrong, this is because it fails to meet a standard that should it be ignored, will cause us to blame said person for not meeting this standard. The basis of Gibbard's theory on blameworthiness (which is premised on guilt and resentment, not on morals) leads to a non-cognitive account of moral judgements.

2.2.3 Universal Prescriptivism

Prescriptivists believe that moral judgements are a type of prescriptive judgement, akin to imperatives or commands. Hence, the perlocutionary force that arises from the negative attitude towards killing, for instance, is one which commands an individual to not kill (i.e. "Don't kill"). This is clearly lacking in truth-aptness, since imperatives lack the ability to be true or false.

Nonetheless, Hare tries to distinguish the moral claims from regular imperatives, through suggesting that moral claims have a commitment to universality and universalisability. This would explain the way in which moral discourse occurs, since we expect the moral statements we make to be applied equally to everyone; when one claims that stealing is wrong, one is committed to making the same claim regardless of the person to whom it is directed to. However, this attempt at explaining the universal nature of moral claims is undermined by the fact that one can simply refuse the prescription bound by them. Hence, in order for moral claims to be truly universal, they have to constitute more than simply a prescription to an individual (e.g. some invoking of a perfectly rational person).

2.2.4 Quasi-Realism

To Blackburn, there has to be a realist component to our notions of ethics since there seems to be a universal component of morality. He claims that two situations cannot demand different ethical responses for reasons other than differences in the situations themselves, therefore implying that there is a metric to which we engage in moral discussion. Nonetheless, Blackburn argues that ethics cannot be entirely realist, since there are essential moral disagreements and the development and alteration of moral theories over time. Hence, quasi-realism claims that moral claims behave as though they are factual claims even if moral facts and truths do not exist.

This is less of a philosophical position than a program to reconcile a non-cognitivist metaphysics with finding meaning through moral discourse. This position seems to account for the purpose and intention of moral dialogue, without having to acknowledge the truth-aptness of moral claims in reality.

3 MORAL ONTOLOGY

For cognitivists, once we have proven the truth-aptness of moral claims, we can then proceed to a discussion of the nature of morality. There are several different positions that one can take. If one is a non-cognitivist, however, one is usually limited to being an anti-realist and a nihilist about morality (the exception to this being Universal Prescriptivism).

3.1 Moral Realism and Anti-Realism

Moral realists maintain that some forms of moral claims are truth-apt, since ethical sentences do reference an objective moral reality. The origins of such a position arise from Plato, but take on two primary forms in the philosophy of today: naturalism and non-naturalism. To naturalists, “good” and “moral” can be reduced into non-moral properties that exist in human nature. For instance, Bentham’s conception of pleasure as the foundation of morality or Kantian deontology seem to attribute morality to other values. On the other hand, there are non-naturalists, who believe that “good” is already an irreducible simple idea. This is another answer to Moore’s Open Question Argument. More specifically, Moore argues that we can have an intuitive, *a priori* understanding of the properties of moral truths, even as they are indescribable.

On the other hand, moral anti-realists deny the metaphysical existence of a universal morality. This can be argued from the perspective of moral disagreements. After all, the way that we seem to argue for and against certain moral positions seems to suggest one of two things: either moral claims are not actually reporting facts, or when facts are reported, they cannot be found. Under the first strand of argumentation, we inevitably fall back into moral non-cognitivism. There is an embrace of an ethical subjectivism, where moral statements are made true or false by the attitudes or convictions of people. Most of them would end up being relativist (discussed later), but the Ideal Observer Theory and the

Divine Command Theory are uniquely universal. This is because they both acknowledge that morality is subjectively in the hands of a single observer, but this observer or commander is the only person with the ability to dictate what constitutes morality.

The second line of argumentation leads to Moral Error Theory.

3.2 Nature of Moral Judgements

It is also important to consider the varying nature of moral judgements that are made. In other words, when we claim that an action is immoral, we can question who exactly this judgement applies to. There are three different perspectives on this issue: Moral universalism, moral relativism and moral nihilism.

3.2.1 Moral Universalism

To moral universalists, there exists a system of ethics that applies universally for all people, regardless of any characteristics or differences. Crucially, such universalism does not have to be absolutist, and can have actions occurring on a spectrum of right and wrong as is in utilitarianism, for example. There are two further subdivisions of universalism, which are value monism and value pluralism. Value monism holds that all moral goods are commensurate on a single value scale; moral pluralism acknowledges the existence of multiple incommensurate scales of measuring an action. How individuals prioritise between such scales is therefore determined by the individual on a subjective level.

3.2.2 Moral Relativism

To moral relativists, judgements of morality originate from standards set by society or an individual. There exists no objective moral standard through which we assess the truth of a given moral proposition. Hence, no individual can be said to be objectively right or wrong, but merely moral or immoral depending on the society he is in. This position can be taken as an appealing one, with one turning to the existence of fundamental moral disagreements in the field.

It might seem that moral relativists would therefore have to defend a position of acceptance of the perspectives of others, which moral universalists would claim is implausible and counterintuitive. For example, it would mean that we have to accept the terrorist's moral claim that it is moral for him to attack others in public. For one, I argue that we do not have to do so within the boundaries of our society — only in a world where there is no social environment would we then have to be universally accepting. Second, acceptance need not come in the form of quick agreement, and can be compatible with trying to convince others of your position on certain moral issues (you agree that the position that they hold is valid, but want to also justify your own position). But one can still aim for objective knowledge in the relativist frame through intersubjectivity of moral claims from different perspectives and sources, which creates moral knowledge nonetheless (perhaps of a different calibre than other moral claims).

3.3.3 Moral Nihilism

To moral nihilists, nothing is ever morally right or wrong. Most non-cognitive theories would fall under this category. The exception to this is Moral Error Theory, since it is a cognitivist position but denies the existence of a universal or subjective morality. To Mackie, the moral properties that moral language presupposes do not exist, hence making all moral statements false. For instance, moral language seems to frame itself as being prescriptive and supersedes all human desire, but Mackie

maintains that such a property is not possible, as our desires are seemingly the most powerful force of humanity.

4 MORAL EPISTEMOLOGY

Finally, we turn to considering how we derive moral knowledge. There are three main mediums through which we determine moral knowledge, which are experience, reason and intuition.

4.1 Empiricism

To moral empiricists, ethical knowledge is gained through observation and experience. Hence, morality is located in society or exists naturally, for us to discover. Some positions that fall under this are ethical naturalism and ethical subjectivism. The exceptions to this, however, are the Ideal Observer Theory and some forms of Individualist Subjectivism, since those require individual introspection in order to derive moral knowledge. However, the biggest issue with this position is the is-ought problem; what we observe in the real-world might not necessarily be what society ought to be.

4.2 Ethical Rationalism

Similar to epistemic rationalism, moral rationalism maintains that moral truths are known *a priori* and can be discovered with reason alone. Hence, moral truths either take a form similar to Platonic forms that we can access, or are merely universal laws that rules over everyone equally. Most moral realist and ontologically universalist positions subscribe to moral rationalism. The issue with ethical rationalism is trying to explain how moral claims are different from any other claim we make of the world. This is because moral claims seem to be prescriptive in nature, and we are bound by these claims. But if we only arrive at these claims through our thoughts, then they would be the same as any other claim that we can conceive of.

4.3 Ethical Intuitionism

To ethical intuitionists, all foundational moral claims are self-evident, and hence can be known without need for an argument. This does not mean that it has to be obvious, but typically entails that it is difficult to support such intuitive claims since they would be tautological or self-explanatory. One example of an intuitive moral claim is that under most circumstances, we should preserve human life. Sidgwick lists four criteria to determine whether a claim is self-evident:

(a) Claims have to be clear and distinct.
(b) Claims have to be ascertained by careful reflection.
(c) Claims have to be consistent with other self-evident truths.
(d) Claims have to attract general consensus.

Crucially, there is a distinction to be made between knowing a self-evident proposition and knowing that a proposition is self-evident. That is to say, we do not have to know whether a proposition is self-evident in order to consider it true by definition. However, this might appear problematic insofar as it is our understanding of a self-evident claim which justifies our belief in it — in order for our belief in a claim to be justified, we typically have to believe in the evidence that a claim is true or more reliabilist concerns. This is where our intuition plays a role, since they are the intellectual seeming that helps to justify the claims that we make at this level.

The issue with intuitionism then, is that there is no way to guarantee that our intuitions are correct. This is not only because our intuitions could be wrong (as they have been in other areas), but our intuitions on many things are far from universal. Issues such as abortion, for example, lead to people having strong intuitions both for and against it.

4.4 Religious Sources of Moral Knowledge

A final source of knowledge worth considering are religious sources of moral knowledge (e.g. the Bible, or one's religious beliefs in any faith). Typically, religions would prescribe that morality is a set of rules by God or some higher power, that we ought to follow. These religions can therefore serve as the basis for one's moral knowledge.

However, not only do religions give us knowledge at times that we seem to treat as immoral (e.g. stoning as a valid form of punishment is thought to be immoral now, but it was frequently practised in many religions in the past), but it also falls to Euthyphro's Dilemma, which is phrased as a question: *Is the pious loved by the gods because it is pious, or is it pious because it is loved by the gods?* If it is the former, then God seems to be irrelevant to our understanding of morality; instead it is some other power or being higher than God who determines what is morality. If it is the latter, then morality seems to become somewhat arbitrary, where the gods could change morality at any time. In this case, there seems to be no strong reason for us to follow the value system set out by religion.

APPENDIX C: SUMMARY OF METAETHICAL POSITIONS

	Cognitivist	Non-Cognitivist
Universalist	Divine Command Theory Ethical Naturalism Ethical Non-Naturalism Ideal Observer Theory	Universal Prescriptivist
Relativist	Individual Subjectivism Moral Relativism	
Nihilist	Moral Error Theory	Emotivism/Expressivism Norm-Expressivism Quasi-Realism

Legend

Empiricism	Ethical Rationalism	Ethical Intuitionism	Ethical Scepticism

RAFFLES INSTITUTION
KNOWLEDGE AND INQUIRY 2023

CHAPTER 8: AESTHETICS

1 INTRODUCTION TO AESTHETICS

Aesthetics is a concept introduced by Baumgarten in the mid-18th century to provide a foundation for explaining and justifying human judgements about what things are beautiful. This field is this related closely to ideas in fields such as epistemology and metaphysics. A note to make is that an aesthetic object might not be an artistic object, and vice versa. For example, sunsets might be aesthetic, but they would not be conventionally considered to be artistic (unless one assumes the existence of a Creator).

2 THEORIES OF ART

One of the big questions that aesthetics aims to answer is that of delineating art from non-art. Before proceeding with that, however, it is important to question if it is even possible to attain theories of art. There are several strong arguments as to the limitations of a definition to art.

First, Weitz's Open Concept Argument highlights that art is fundamentally indefinable using individually necessary and jointly sufficient conditions. The argument is as follows:

(i) *A concept is open if a case can be imagined or created such that we either need to extend our current concept to cover it, or we need to introduce new concepts to explain the new case.*
(ii) *All open concepts are indefinable.*
(iii) *There are cases calling for a decision to expand or close the definition of art.*
(iv) *Therefore, art is indefinable.*

Another Wittengensteinian argument that can be that definitions of art typically centre around definitions such as "expressiveness" and "form", which are deeply grounded in philosophical fields of philosophy. By an Appeal to Ordinary Language, such definitions are thus deemed meaningless, and any definition of art by extension is also considered to not contain actual meaning, merely being manipulations of language.

Nonetheless, philosophers have tried to find a definition for art.

2.1 Mimesis

Perhaps the most rudimentary form of art theory, the mimetic theory of art is that something is a work of art only if it is an imitation of real life. This theory can be traced to Plato, who argues that art is a shade of reality, and reality is in turn a shade of the Platonic Forms. There is some basis for this definition of art: some forms of art do try and replicate real landscapes and people, while ancient forms of dance mimicked the movement of animals in nature. Other notable examples include, but are not limited to, Beethoven's *Pastorale* and Shakespeare's *Julius Caesar*.

Obviously, the biggest flaw with such a definition is that not all artworks imitate real life. For example, cubist artworks such as Pablo Picasso's *Guitar* (1913) does not seem to be a reflection of reality at all, but we call it art nonetheless. Similarly, a significant proportion of music does not appear to be a direct replication of the world, but it is still widely treated as art.

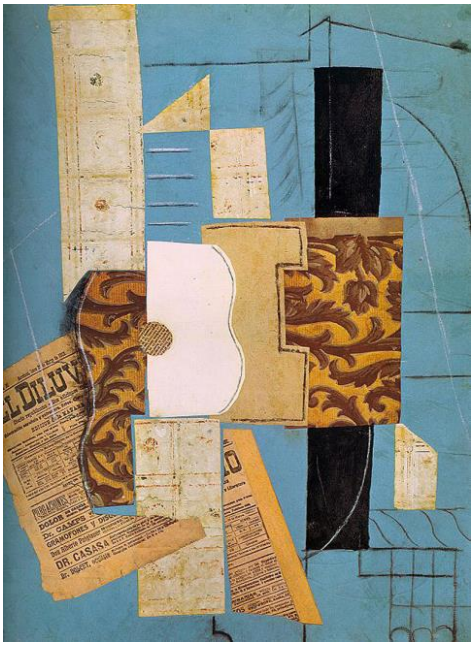


Figure 1: Pablo Picasso's *Guitar* (1913)

2.2 Representation and Neo-Representation

Hence, an improvement to the above mimetic theory has been proposed, which are what we consider to be representation theories of art. This constitutes a broader definition of what constitutes art. For the representation theory of art, art is something that represents something else in reality, and is recognised by audiences as such. Such a definition allows for more things to be considered art, since artists now have greater freedom in how they wish to portray a certain thing in reality. For example, Piet Mondrian's *Broadway Boogie Woogie* (1942-1943) uses colours and tape to stand in for the complex cityscape of New York city, thus representing it.

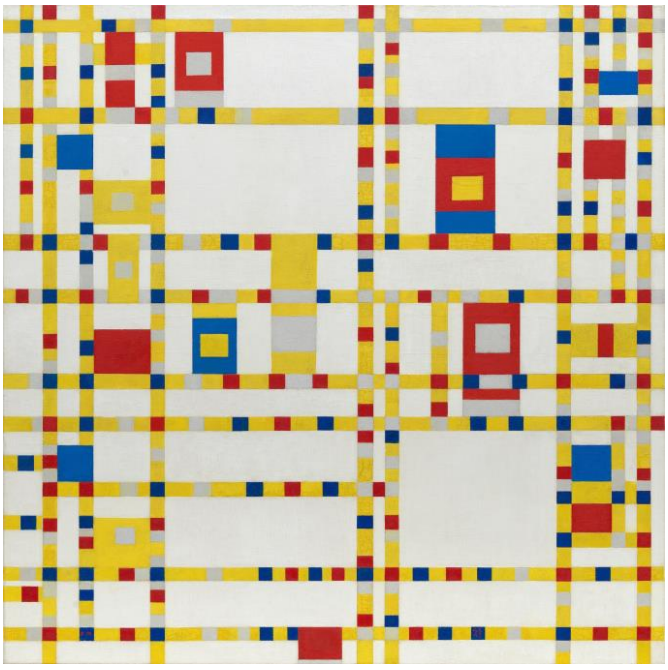


Figure 2: Piet Mondrian's *Broadway Boogie Woogie* (1942-1943)

Neo-representation takes this one step further — as long as a work is making some comment about a subject (and thus has semantic content), it is considered art. Hence, this detaches completely from describing the real-world, and now can refer to abstract concepts such as our emotions. All that matters therefore is the intention of the artist (and that it must possess some degree of "aboutness"), and our ability to interpret such an intention from the artist. This is evinced through Marcel Duchamp's various readymades that he places on display for others to see, since the only property they possess is that it is regarding something, and was done with intention.

Nonetheless, the above theories of art do not seem to account for a full spectrum of art. In particular, it seems to ignore art that was not made with any specific commentary purpose in mind, such as music that is solely meant to please the ear, or random splashes of paint as in Jackson Pollock's artworks. At times, it is also difficult to distinguish whether or not an artwork truly has a commentative purpose.

2.3 Expression

Instead of focusing on the outward factors of a painting (i.e. whether or not it reflects the world in some manner), a more introspective perspective of art has arisen. To expression theorists, something is art if and only if it is an intended transmission to an audience of the self-same, individualised emotion that the artist experienced and clarified by means of lines, shapes, colours, sounds, actions and/or words. Such a definition seems to account for the ways that artists proceed with the creation of art; first beginning with a vague feeling, before clarifying it and making it more precise through his medium. Notably, the feeling that the artist experiences does not have to be the exact same as the audience, but it must be of the same emotion-type.

Nonetheless, given that this is a treatment of art as a closed concept, there are numerous attacks to such a theory of art. For one, a work created without an intended audience in mind can still be considered art (c.f. Kafka and Emily Dickinson, who did not want their works to be published). The simple rejoinder to this is to suggest a weakened criterion for intention, which is that any person working in a publicly accessible medium is intended, in principle, to transmit something to an audience. Even if something is produced in a publicly inaccessible medium, there is minimally an intended audience, which is the artist himself. Next, not all art seems to transmit emotion, and can be simply to explore ideas or induce pleasure due to beauty. For example, M.C. Escher's *Drawing Hands* (1948) is a cognitive stimulant on the distinction between two-dimension and three-dimension, and presents a paradox, but conveys no emotions directly. Similarly, the atonal music of Arnold Schönberg does not convey meaning, but is an experiment on an abandonment of tonal centre. Architectural drawings do not convey emotion, but are considered to be works of art at times.

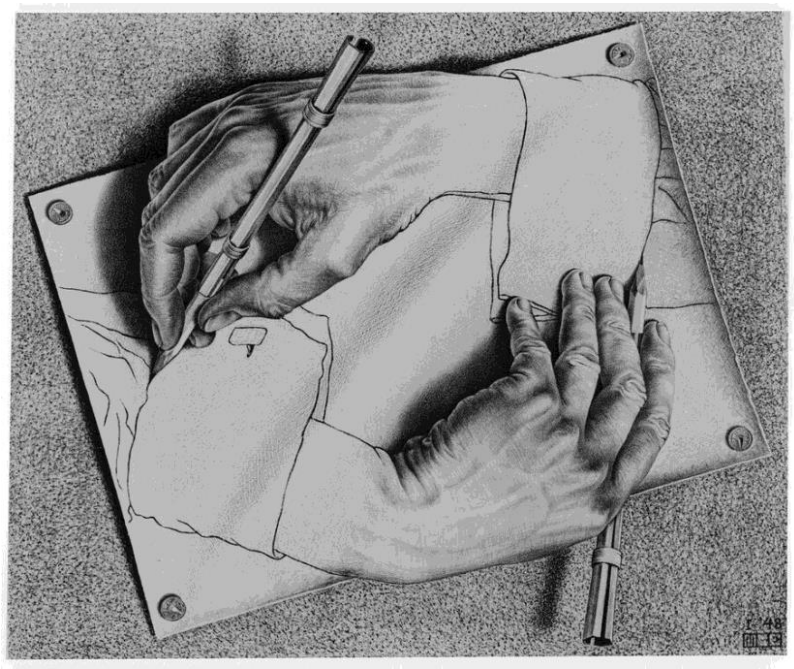


Figure 3: M.C. Escher's *Drawing Hands* (1948)

Some critics have also contested the nature of individualised emotion in art. This is because the definition seems to argue that the emotion that an artwork portrays has to be unique, or minimally non-generic. Yet, there are numerous examples of art that would fail this criterion, such as the various paintings of Christ, which mostly convey similar feelings of reverence. This might be due to the ways that individuals appreciate art through social contexts, but I digress. Ultimately, since most emotional states have something generic about them, it might be difficult to establish whether an emotion is truly unique and individualised. Moreover, such emotion does not have to be experienced by the artist — if an artist is able to induce horror and fear in the audience, it does not seem to matter whether or not he has experienced this same emotion. Finally, there is a problem on clarification in art, since some artforms inherently prefer a raw, unrevised form of emotion instead of presented polished feelings (e.g. Jazz). Furthermore, if art was produced in a moment of brilliance, then it would be nonetheless unclarified, even though it does actively convey emotions.

2.4 Formalism

To formalists, something is an artwork if and only if it is designed primarily to possess significant form. Form refers to qualities of the piece of art itself (e.g. lines, textures, colours). Hence, when art contains good form, it will elicit a positive emotional response from viewers. This definition is perhaps the broadest, since the concept of form is not particularly rigid, and can change over time and account for different styles and types of art. Formalism seems to be a step further than expression and representation theories of art, since this manages to account for how we appreciate modern art. We tend to study and perceive the features of an artwork, and how it is able to induce emotions in us.

The strongest argument for such a position is the common denominator argument. This is because given our current intuitive understanding of art (and non-art), there has to be a common denominator that must be possessed by all forms of art. Since art is clearly not representation and not all art involves expression, the presence of a significant form is the last possible common denominator available. Hence, the presence of form is able to unify various works of art under the concept of form. Another argument in support is that of functionality. Since something must possess a primary function

that is unique to art in order for it to become a work of art, and representation and expression are both non-unique primary functions of art — functional objects and facial expressions are not considered to be works of art, for example — form has to be the unique primary function of art.

Nonetheless, there are several criticisms of this theory as well. For one, not all artworks are designed to exhibit significant form, and only have significant form as a matter of coincidence. Returning to the various paintings and murals of Christ, the primary purpose of such artworks is primarily to inspire individuals to respect and revere, not to show form. The problem therefore lies in the intentionality of art. But removing this intentionality condition only makes the definition of art too inclusive, since there are many things that have significant form but do not have a creator, or are made with intentionality (e.g. mathematical theorems, nature).

There are also works of art that do not seem to possess form. John Cage's *4'33"* solely consists of ambient sounds for the entire duration of the piece, which lacks any sort of definite form. Similarly, Salvatore Garau's *Io sono* ("I Am", 2021) is an "intangible sculpture" with no conception of form whatsoever.

2.5 Institutional

The institutional theory of art is a theory that situates artworks within a social context of society. This pulls away from theories that focus on innate qualities of an artwork, to considering who deems that something is art. This is also somewhat built on neo-Wittgensteinian theories of family resemblances in art, which states that something can be art if it resembles a paradigm artwork. The distinction here is that this theory accounts for the origins of such paradigm artworks, being situated in social contexts. By the institutional theory of art therefore, something is a work of art if it is an artifact upon which a member of the artworld (or any art institution) confers the status of being a candidate for appreciation. Hence, Duchamp's readymades can be considered art, because it is situated within a social context, and the art community has deemed it as worthy of appreciation.

Crucially, to become a member of the artworld, one only needs to acquire understanding, knowledge and experience about art; it is not elitist or anti-democratic. The artworld is not a social institution (like the Church) which has explicit rules, members and hierarchy. It is thus unable to genuinely confer the status of a candidate of appreciation to an institution, with its members awarding such recognitions. However, this definition seems to be rather vague, and ends up accepting a lot of things to be art. Additionally, in order to identify members of the artworld, we have to use some form of artwork as a metric to measure one's learnedness. Yet, to claim that there is a genuine artwork presumes that members of the artworld have already cast judgement, implying that the artworld does exist. Hence, we reach a circular argument with respect to defining art and who can make judgements about whether something is art or not. Even if there is a way to identify who is part of the artworld, this does not exclude the possibility that these individuals make incorrect decisions as to whether something is art or not.

Additionally, some philosophers argue that art can be produced outside a network of social practices. If a Neolithic man stacks stones in a particular order, it seems difficult to claim that it definitely cannot be considered art. Nonetheless, defenders of this theory would claim that these only constitute a small proportion of art, if it is even art in the first place.

2.6 Historical

The above criticism of the institutional theory of art serves as the starting point for the historical theory of art. To such theorists, something is an artwork only if it is intended to support some particular art regard. Art regards can take on any of the above forms mentioned in 2.1 to 2.4, ranging from expressions of feeling to significant form and representations of reality. This theory thus escapes the issue of art being created within a social context, since it only requires individuals to identify it in relation to other works that historically precede it. This approach is this diachronic, as opposed to the synchronicity of an institutional theory of art.

This theory, however, does not escape the criticisms raised against an institutional theory of art. Any art that is not accounted for in our limited conception of art history (such as non-Western art in Western paradigms of art) cannot be appreciated under this theory, since there is no history to which we can situate these works. Additionally, this does not adequately definitively prove base cases for art, since for these base cases, there would be no historical precedence to go off of. Finally, there is a version of Euthyphro's dilemma at play:

(i) *Definitions either include substantive characterisations as to what constitutes an expert or does not.*
(ii) *If there is no characterisation as to what constitutes an expert, then we would not know what makes something an artwork (since we have nothing to base our judgements on).*
(iii) *If there is a substantive characterisation as to what constitutes an expert, then the definition of art is not historical, instead basing it off the criterion of an expert.*
(iv) *One cannot claim that art is historically defined.*

3 THEORIES OF BEAUTY

A related question to consider is that of defining beauty. In order for us to make reasoned aesthetic judgements, this is a question that we will need to answer fundamentally.

For one, beauty can be a state of being that society labours towards. What pushes our own quality of life up from those of basic physiological needs are ultimately driven by beauty; our love for beauty causes us to adopt clean cityscapes and organisation, which benefit us. In our chase for beauty, we end up paying attention to the small details in our lives, and improve it for the better.

Second, beauty can merely be an ideology of the ruling class. This is an aestheticisation of politics, since the dominant in society will want to perpetuate their own culture and identity, and this is best done through referring to it as beauty that everyone else has to chase towards.

Third, beauty can be that which we yearn for, which is a position that is forwarded by proponents such as Kant and Nietzsche. Since the judgement of taste is not based on concepts nor a report of the features and feelings they provoke, instead coming to us through intuition, it takes the form of a guess that might be wrong. When we judge something to be beautiful, therefore, we are expressing that we desire to possess and know that particular thing better; we remain fixed to the allure of the object.

Fourth, beauty can arise from the search for objects of talismanic properties. This is historically backed by evidence revealing that the arts developed incidentally to the search for talismanic properties. What is means is that while initially, groups such as the Egyptians used gold for its talismanic properties, it eventually became more decorative in function over time. But this is a

somewhat unintuitive view of beauty since the functional aspects of an object and its beauty seem to be independent of each other. In fact, Kant would suggest that beauty is inherently free of social functions, a conception based on the notion that art is subordinate to the aesthetic beauty of the natural world (consider the beauty of a sunset versus the beauty of a painting of said sunset).

Fifth, some academics argue that beauty is sinister, since it impedes on other practices that we might find more important. Hence, discussions about beauty are only used as a medium to hone our discourse and other critical faculties — the power of the aesthetic comes from its intimate link with knowledge.

Sixth, beauty can be viewed as independent of nature and perceived intellectually. This is supported by Plato, who claimed that beauty and good are forms that are available to the soul, but not the senses. Therefore, the highest form of beauty is the Form of beauty and goodness, with all manifestations being inferior to it. This accounts for a conventional understanding of beauty; we know whether something is beautiful, but find it difficult to make any further statements about its beauty (e.g. explaining why it is beautiful).

Ostensibly, there are numerous different theories as to what beauty is. It is important to consider all these perspectives, since these theories influence the position that we can take with regard to how we can justify aesthetic claims, and how we find truth in aesthetic judgements.

4 AESTHETIC JUDGEMENTS

Finally, we can now turn to the philosophy of aesthetic judgements (whether we consider something to be beautiful or not). With respect to making aesthetic judgements, there are two major views, held by Kant and Hume.

4.1 Hume's Aesthetics

To Hume, our aesthetic judgements are primarily informed by our feelings, not rational *a priori* thought. This is because recognitions of virtue and beauty require particular sentiments in human observers; without these sentiments, we would not be motivated to chase after the beautiful. In his empiricist self, Hume thus supports the notion of taste as being driven by experience which can connect our understanding of taste with practical consequences.

Additionally, Hume also privileges the role of imagination in his aesthetics. This is because our imaginations have the capacity to extend our thoughts beyond our actual experiences, and learned associations allow us to create chains of associated ideas, and to create ideas of things that never actually happened. Therefore, any response to a work of art is not solely that of the senses, but also includes the complex association of ideas and impressions. Nonetheless, there are situations where imagination is not required, but these are only limited to cases where the form of an object is sufficient to generate approbation (such as in cases of natural beauty).

Given the above, Hume considers aesthetic judgements to arise from following a standard of taste that is set out by the joint verdict of True Judges. He disagrees with the relativist position, claiming that there are definitely some opinions of taste that are better than others. Yet, he does not seem to be entirely abandoning his subjectivist stance, since he does not seem to claim that sentiments are

true or false in any absolute sense, instead requiring explanations as to why some critics are better or worse.

For Hume, his True Judges are rare and have to fulfil the following criteria:

(a) *Strong Sense*: Not allowing minute details of a piece of art to escape one's observation.
(b) *United to Delicate Sentiment*: Being sensitive to the finer emotions and can consider a piece of art in its unity.
(c) *Improvement by Practice*: Undergoing constant practice of both the arts and making aesthetic judgements.
(d) *Perfected by Comparisons*: Being able to make comparisons between works of art.
(e) *Free of Prejudice*: Only taking the work of art as it would be viewed by an ordinary audience.

Given the rarity of such True Judges, the standards of taste are thus not defined by contemporary critics, but all qualified judges over time and from multiple cultures. For the most part, Hume acknowledges that there will be some form of reasonable difference in the opinions of True Judges. First, different critics may have different dispositions of character, that lead to them making different judgements about art, and other cultural differences caused by their environment. A third source of disagreement that Hume implies is his recognition that different objects can reflect different sources of beauty — comparing Austen to van Gogh will not lead to a conclusive, uniform consensus.

However, Hume never seems to tell us what standards of taste constitute, merely that they can be found. This can seem empty, especially when his own argument appears to exhibit some form of circularity: aesthetically superior artworks are endorsed by judges of superior taste, but judges of superior taste are identified by their endorsement of the best art. Furthermore, the above stipulations of a True Judge seem to limit it to only people with wealth, education and leisure, which precludes a diversity of True Judges from arising.

4.2 Kant's Aesthetics

Kant's aesthetics can be characterised by four moments, that aim to separate judgements of beauty from other judgements, such as those of agreeability ("I like the colour red") and judgements of the good ("Killing is immoral").

In his first moment, Kant clarifies that judgements of beauty are based on feelings of pleasure. However, this pleasure is disinterested, which means that it is independent of an individual's desire for an object, and does not induce such desires. Instead, the feelings of pleasure are likely to come from form, but there is no universal concept of form (hence his "reflective judgement", where the judgement must rely on itself). The fact that judgements of beauty are not based on objective concepts ultimately distinguishes it from most cognitive judgements (such as those of morality). Yet, since we are to find pleasure in something beautiful, and not find beauty in something pleasurable, this is distinct from judgements of the agreeable.

In his second moment, Kant claims that judgements of beauty have a sort of subjective universality. When we make an aesthetic judgement, we are ultimately using our own individual faculties. Given further that we are not basing our conceptions of beauty on concepts, claims that we make about beauty are unprovable and subjective. Yet, there is a universalist element to our claims; when we make a claim, we assume that everybody else agrees with us. This is a further distinguishing factor from judgements of agreeability, since statements such as "I like the colour red" do not have to assume that it applies to everyone.

In his third moment, Kant argues that beautiful objects appear to be purposive without purpose. This means that we feel as though beautiful objects have a purpose (to make us feel a certain way, or to be compatible with our mental faculties). But in reality, they do not have a purpose, since beautiful objects are independent of any cognitive concepts and of our real-world. Therefore, the interaction between our imagination and the object in question determines whether or not it is beautiful. If it inspires the harmonious free play of our cognitive powers (hence appearing as though it has purpose), then we will see it as true beauty.

In his fourth moment, Kant posits that aesthetic judgements must be necessary. When we make a claim that something is beautiful, the imperative force of the statement implies that everyone ought to think the same way about it. He believes that everyone has a shared faculty for perceiving beauty, and as a result there is a common sense that makes these judgements necessary.

Kant's approach to aesthetics seems to be a middle ground between rational judgements and those of agreeability. On one hand, the fact that aesthetic judgements are based on feeling, and do not subsume objects under specific concepts (since universal concepts for beauty do not exist) suggest that judgements of beauty should not belong to rational endeavours (since whether or not something is beautiful cannot be proven), and is aligned with judgements of agreeability. However, judgements of beauty claim to be universal and necessary, which make a normative claim to everyone's agreement, and thus should be a part of cognitive judgements. This conception of a judgement of beauty being based on feeling, yet attempting to be universal thus reconciles the empiricist and rationalist traditions of 18th-century aesthetics.

In Kant's aesthetics, therefore, he assumes the dual nature of our experiences. We all have an *a priori* 'common sense' that functions as an aesthetic intuition to guide us in making aesthetic judgements, yet aesthetic judgements are only possible if there is a free play of our cognitive faculties of imagination and understanding. The latter refers to a lack of boundary with respect to where our minds can wander to — in most ordinary rational contexts, our judgements are restricted to the concept of the object. For example, when judging if something is a chair, our cognitive faculties are limited to the concept of a chair, but such bounds do not exist in the case of thinking about whether or not something is beautiful, since the concept of beauty does not exist.

However, Kant does not seem to adequately account for aesthetic disputes, or minimally the ever-changing notions about aesthetics. Since Kant prescribes that aesthetic judgements are universal and prescriptive, the reality that people disagree on the aesthetic value of objects regularly seems to undermine this claim. More broadly, Kant seems to assume that the perception and judgement of all members of society are the same, but this is not necessarily true. Critics will also question why the universality of claims is a necessary concept in order for us to have aesthetic judgements; as Hume has claimed, total consensus does not make sense and is impossible in the case of aesthetic judgements.

4.3 Other Theories of Aesthetic Judgements

Of course, there are other ideas held by philosophers apart from Kant or Hume of how we are able to obtain knowledge of what is beautiful. For example, one could be relativist about beauty, which is that it lies in relation to the culture and social context that one is situated within. However, this seems to ignore the reality that we seem to seek a universal understanding of aesthetic judgements, in spite of

the inherent emotion and subjectivity involved in aesthetic judgements (this is in fact what Kant tried to resolve in his Moments).

Alternatively, there are Platonist positions about aesthetic judgements, but these fall victim to the same issues discussed in previous chapters about access and what the characteristics of these Forms that transcend our reality.

5 ART AND KNOWLEDGE

5.1 Knowledge of Art

It is trivially possible to gain knowledge of the characteristics of artworks. For instance, it should be clear that a statement such as "Monet's *Woman With A Parasol* (1875) is painted using oil paints" can be considered a claim of knowledge. This is because such claims can be directly verified through inspecting the artwork or other uncontroversial means of analysis.

However, it is much harder to make claims about certain features in a work of art creates certain emotions or responses in an individual. Since how individuals respond to a work of art is subjective, it might be difficult to definitively associate a particular feature in a work with a particular response. There is also the issue that at times, it is difficult to find the features which are the sources of these feelings, even if they are present — if it is an emotional response, then our rational faculties might not be able to identify it. Nonetheless, some fields of art have tried to perform such a (formalist) analysis, with one example being Practical Criticism in the field of literature.

5.2 Propositional Knowledge from Art

Next, we can consider the kinds of knowledge that we can gain *from* art. The propositional knowledge that we can gain from a work of art extends to some claims about the world (e.g. from *Saint Joan* we can know that Joan of Arc was burnt at the stake) or some moral claims (e.g. from *Titus Andronicus* we can know that murder is immoral, even if it is for revenge).

However, such propositional knowledge seems to fail on two fronts. On one hand, if works of art are not necessarily an accurate representation of reality (since art need not be representing reality, it can be altered), then there is no way to guarantee that a claim gained from a work of art is true, or that we are justified in believing that it is true. In all likelihood, we rely on other external sources for the warrant of claims that we gain from art, not the artwork itself; a work of art cannot provide the justification for knowledge by itself. On the other hand, a work of art does not seem to give us unique knowledge. This means that any claim that we can gain through art can be gained through other means. For example, the above claim about Joan of Arc can be gained via looking through historical records. Thus, there is no inherent benefit of gaining knowledge through art, and in fact these alternative sources are usually more credible and trustworthy, leading to better knowledge.

In spite of the above Warrant and Uniqueness challenges, art might still serve as the origin for certain types of knowledge, even if it is not the main justificatory source. From reading novels, we place ourselves into situations which we might not have conceived of, and therefore gain new insights into morality; from looking at a painting we might be intrigued about a certain historical figure depicted and delve into further research. To say that art is completely useless in giving us knowledge, therefore, seems to be misguided.

5.3 Non-Propositional Knowledge from Art

Finally, art is able to provide us with non-propositional knowledge. This can come in several forms. First, one can gain tacit knowledge about how to improve one's artistic skills. From listening to Yunchan Lim's Rachmaninoff Piano Concerto No. 3, for instance, a musician can improve his own rendition of the piece and improve on other technical aspects. Second, one can gain experiential knowledge through artforms such as movies and novels. This is because such works of art allow the audience to be placed into the position of the narrator/persona, thereby gaining an understanding of what it is like to experience something (e.g. what it is like to be a woman in the Regency era from reading *Pride and Prejudice*). Other forms of knowledge such as introspective knowledge (knowledge about oneself and one's dispositions) or religious knowledge (knowledge about the existence of the divine) can also be gained from experiencing certain forms of art. All these forms of knowledge are not propositional insofar as a JTB account of knowledge does not apply to them, but they are still what we would intuitively consider to be knowledge.