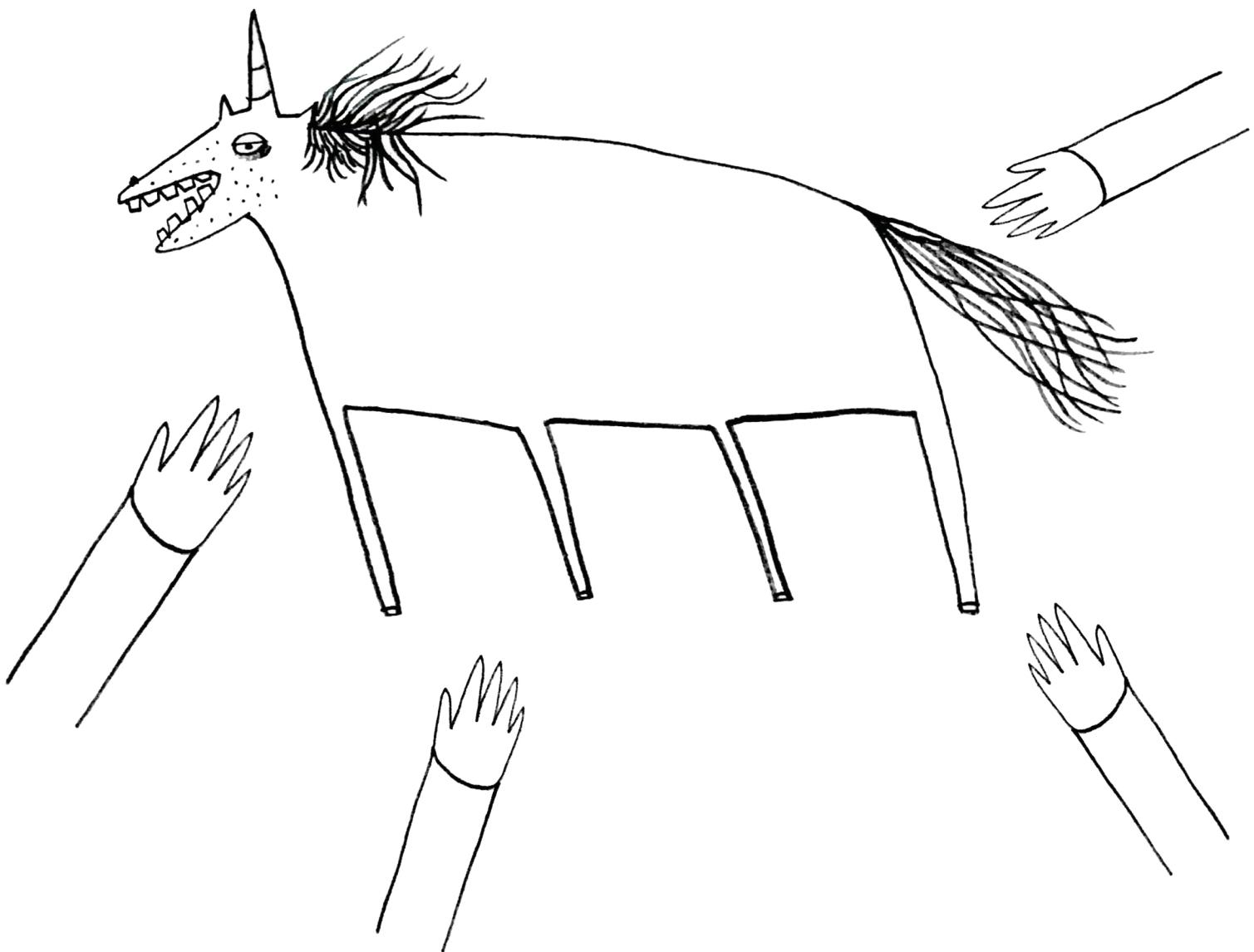


# A short guide to ontology and epistemology

(why everyone should be a critical realist)



Tom Fryer

'For the beginner, ontology, epistemology and the whole philosophy of social science can be a maze: it's hard to know which way to turn because it's impossible to see the map. Tom Fryer has been through that maze recently enough to remember exactly how that feels and he has sketched out the main contours of the map to get you started on the route.'

Accessibly. Brilliantly. Critical realist-ly. I thoroughly recommend reading it.'

*Dr Dave Elder-Vass, Loughborough University*

'This is a really helpful guide for anyone who gets mixed up with philosophical terms like ontology, epistemology, positivism, constructivism and critical realism... Before reading it, I couldn't imagine that these concepts could be explained in such an easy (and fun!) way.'

*Ying Yang, University of Manchester*

'This guide is perfect for PhD students who want to understand what they do and don't understand and how they might go about understanding more based on how they understand what they understand. Understand?'

*Bobbie Dutton, University of Manchester*

'You're writing a guide about what now?'

*My Gran, Unaffiliated*

*A short guide to ontology and epistemology: why everyone should be a critical realist*  
Tom Fryer, 2020

[t fryer.com/ontology-guide](http://t fryer.com/ontology-guide)

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Cover and design: Joanna Kozak

## **Thanks**

I'd like to thank a number of people for making this guide possible. First of all, I'm very grateful to the Bhaskar Memorial Fund for taking a risk and funding this project. For the insights, suggestions and edits I owe much to Bobbie, Parise and Dave. More generally, thanks to everyone who's listened to me banging on about critical realism and helped me think about how to (and how not to) share its insights. Also, thanks to Joanna for the amazing illustrations—I'm getting close to 83% convinced that design matters...

Howdy.

Let me start off by saying congrats on getting into a postgrad programme. It's no simple thing to do and definitely deserves a pat on the back.

I hope you're excited to get cracking on things. I remember feeling this weird combination of anxiety, but being raring to go, excited, as well as a bit overwhelmed. It's tiring feeling all that at once.

That's why I wrote this guide. I hope it makes your life a little easier and helps you think about one really important part of your research.

I'd be willing to bet a serious amount of money that at some point over the next couple of months you're going to hear someone mention 'ontology', 'epistemology', 'research paradigms' and 'philosophical assumptions'. If you're lucky you might even come across someone chatting about 'normativity'. Most unis run some kind of training programme for new postgrads, so you'll probably come across these terms, as well as the occasional reference to 'positivism', 'constructivism', 'interpretivism', 'critical realism', 'pragmatism' and 'subjectivism'.

The first point to make is that *you are not stupid*.

That's not quite right. I've not got the foggiest how smart you are and I'm not trying to be some kind of motivational speaker. Anyone who knows me can vouch for that...

Let me clarify. If you're bamboozled by all the different terms then *don't take this as evidence that you're stupid*. There's a stupid number of terms, used in a stupid number of ways, to refer to a stupid number of different things. It really isn't you.

Faced with this situation, it's super tempting to just give up. You might go as far as figuring out a couple of sentences that you can wazz in your thesis like: "I adopt a pragmatist stance because I believe your methodology should respond to the research questions being asked". If you're feeling keen, you might even read Crotty's (1998) *The Foundations of Social Research* and pick your philosophical approach from his 'oven-ready' versions.

Please don't do this.

I'm not normally prone to melodrama, but I'd get down on my knees and beg you not to do this.

Here's my elevator pitch for why.

If you don't think about ontology and epistemology then there's a risk that you'll go looking for shit that doesn't exist, or you'll ignore super obvious shit that's right in front of you. There's also the risk that you end up using shit methods, to answer shit questions, which is probably just going to give you shit answers.

Who knew elevator pitches needed more swearing? #ShitInTheElevator

Seriously though, to do good research you need to have a decent underlying philosophy.

That's why this guide aims to:

- A. Show you why it's important to think about your philosophical position.
- B. Give you a simple framework to understand all those complicated terms.
- C. Make the case for why you should be a critical realist.

To do this, I've organised the guide into four sections:

- 1. What's the point of thinking about ontology?
- 2. How you can understand all the complex terms and concepts?
- 3. What is positivism, constructivism and critical realism?
- 4. And, why should everyone be a critical realist?

Happy reading, and I hope it helps :)



#ShitInTheElevator

## Section 1: What's the point?

Okay, what's the point of thinking about ontology and epistemology?

First things first. What even are ontology and epistemology?

Ontology is about stuff. It looks at what stuff is in the world and what that stuff is like. It includes questions like: what's in the world or what's real?

We could get all technical and break ontology into its two Greek words meaning *being* and *study*. That makes ontology the study of being, which is just a fancy way of saying the 'study of stuff'.

The other key term is epistemology. Again, it's kinda useful to look at how the word is formed, this time it's two Greek words meaning *knowledge* and *study*. So, epistemology is the study of knowledge.

Instead of questions about what the world is like—that's ontology—epistemology is more interested in how we can produce knowledge about the world. Are there good and bad ways of doing this? How reliable is our knowledge?

Now, it's pretty easy to get ontology and epistemology mixed up. I just saw a tweet that said something along the lines of 'if you know what ontology and epistemology are without googling, then there's a 100% chance you're a douche'.

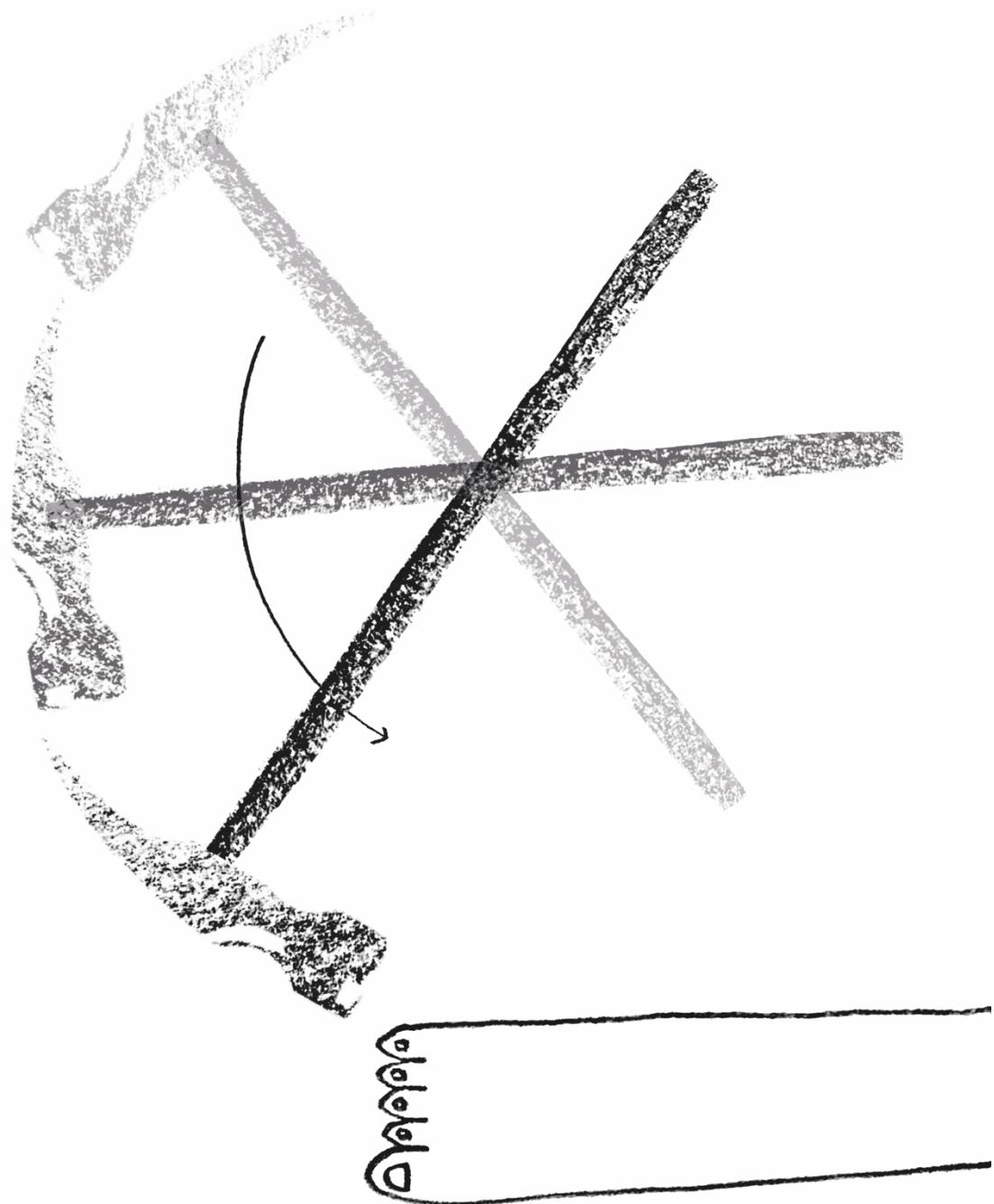
Ouch. That stings.

But it doesn't have to be this way. Here's a silly way to remember the difference:

- Ontology sounds like 'on toe logy', or the study of *what you just dropped on your toe*. Now, if you just dropped a hammer on your toe, I guarantee you're going to be thinking about reality. You're going to be thinking about real hammers and real pain, in the real world. There's no way you're going to be in the mind-frame to ask: "How do I produce knowledge about this hammer?" You'll be pretty focused on its reality. That's ontology.
- Epistemology sounds a bit like 'epic stem ology', or the study of *epic stems*. Imagine your mate, who is a plant scientist, comes up to you and says "hey buddy, look at the epic stem on this plant, how cool". I'm guessing your first reaction will be: Is that really an epic stem? How does Dave know that's an epic stem? Why does Dave have some right weird opinions? You can see these are all questions about *knowledge*, ie epistemology.

A tad daft, I know. But I hope it helps you remember.

Now we know the basics, let me have a go at convincing you that it's really important to think about which ontology and epistemology you adopt in your research.



'On toe logy'

---

*"If you don't think about ontology and epistemology there's a pretty good chance you'll end up with a naff project."*

---

Controversial, I know.

Okay, here's why ontology is important. All research sets out to find things. Some sets out to find universal laws of nature. Others embark on a journey to collect stories. And a few smarty pants set out to find causal mechanisms that act as tendencies (I'll explain this later).

Now, having a bad theory of ontology means that you risk setting off into the world to find stuff that doesn't exist. Your research would be doomed to fail from the start. A decent theory of ontology stops us from looking for the wrong things.

Think about these stories from Aldi (my local supermarket):

*I'm having a mid-life crisis and want to buy a Ferrari. I decide to go to Aldi to buy one. As much as I might want to buy a Ferrari, and as much as I might delude myself that Aldi actually sells them, this has absolutely no impact on the reality of the world. Aldi just doesn't sell Ferraris. It's silly to look for Ferraris in Aldi.*

Research that uses a bad ontological assumption is as daft as this hypothetical future mid-life crisis me looking for a Ferrari in Aldi. I might set out to find something in the world, but if I'm wrong about the nature of the world, then I'm never going to find it. It's a wild goose chase.

Actually, it's more like a wild unicorn chase, as geese do exist.

There's another way that a bad theory of ontology can set you off on the wrong path. However, instead of looking for something that doesn't exist, this time our bad theory makes us ignore big chunks of the world. Again, let's go to Aldi:

*I love carrots. Carrot soup, carrot mash, roasted up with a bit of olive oil and rosemary. Yummy, yummy, yummy, in my tummy, tummy, tummy. I buy all my carrots from Aldi. In fact it's the only thing that I buy from Aldi. That's perfectly fine, if a bit weird. But I'd be wrong to tell my friend that Aldi only sells carrots. I'd be missing out on the big picture and all the other things that Aldi sells. They don't sell everything, but it's definitely more than just carrots.*

This deluded carrot-loving fiend is a bit like research that only sets out to find stories. There's nothing wrong with carrots. There's nothing wrong with collecting stories. It can actually be a super important kind of research, listening to people that academic research has tended to ignore in the past. This type of research only becomes a problem when we assume there's nothing else in the world other than stories. Just like Aldi sells more than just carrots, the world consists of more than just stories.

So, research needs a decent ontology, so that 1) you don't go looking for something that doesn't exist or 2) so you don't ignore the full reality of the world. If you set off with a bad theory of ontology you really are risking that you'll end up with a naff project.

## Convinced? Maybe a little?

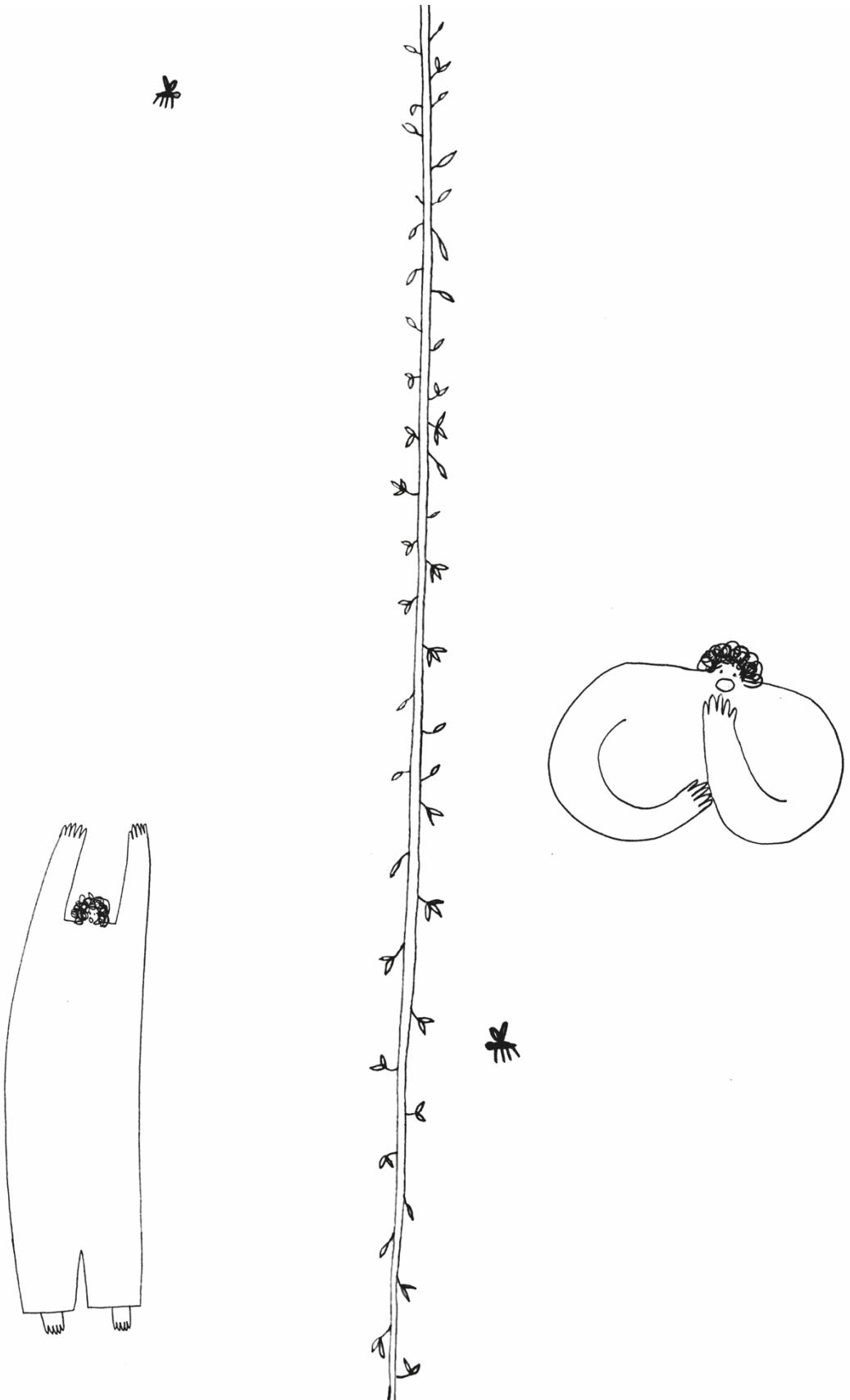
Hopefully you agree that it's at least a bit important to think about ontology. I might have been a little too bold and controversial with my original statement—I read somewhere that you tend to remember things more when you have an emotional reaction, so I'm going to claim this as some pre-planned teaching strategy... If you're still reading this then I guess it worked.

In the next section, I'll explain how to understand all the complicated terms and concepts you might hear by giving you a simple framework to navigate through this maze.

There's also a glossary at the end with some useful definitions, just in case I slip into using too much jargon. I'll try not to though.

### Key points

- Ontology or 'on toe logy' is the study of being and reality, like the reality of dropping a hammer on your toe.
- Epistemology or 'epic stem logy' is the study of knowledge, or how Dave knows if that stem really is epic or not.
- You should think about your ontology and epistemology before your research otherwise you risk searching for stuff that doesn't exist or missing out on important parts of the world.



Epic stem, Dave

## Section 2: Stuff is way too complicated

You might be minding your own business, eating a sandwich, dozing off in a lecture, in an intense meeting with your supervisor or maybe even down the pub if you've got cool mates, but at some point you'll get asked:

*'What philosophical paradigm are you going to use?'*

*'What's your ontological and epistemological position?'*

Panic stations.

What the hell are you going to say?

You've probably heard a ridiculous number of terms used to describe different philosophical positions. Some of these probably ring a bell: subjectivism, constructivism, interpretivism, phenomenology, hermeneutics, positivism, objectivism, post-positivism, post-modernism, critical realism, critical theory, post-colonialism, pragmatism, structuralism... The list could go on and on. But which one are you going to pick?

Let me let you into a secret. The person asking you these questions probably also hasn't got the foggiest what a philosophical paradigm is. Like you, they keep getting all the terms mixed up. Like you, they think that ontology and epistemology sound like a hospital department specialised on bones and stem cells. Like you, they've probably been put off from looking into philosophy because too much of it seems dense for the sake of being dense, complex for the sake of being complex, discombobulated for the sake of being discombobulated.

The second thing to note is that most of these complicated terms are bollocks.

I don't mean that they're useless. They often refer to a research tradition, so in that sense they're useful. But the terms really are pretty useless for understanding and categorising different philosophical positions.

It's a classic case of too many cooks have spoiled the broth. There's so many people doing all kinds of research and everyone wants to give their own thing a new name. This means we've ended up with tonnes of different terms, used in different ways by different people, so it becomes almost impossible to work out what anything means. Argh! Stuff is way too complicated!

I propose we start again.

We need to chuck the baby out with the bathwater. Actually, we need to rip out the bath and install a shower—who has time for a bath nowadays?

We need to go back to the basics of what makes a philosophical position and build up our concepts from there. Let's do this.

Okay, for any philosophical position, we only need to think about two things:

- Ontology
- Epistemology

Luckily we already know what these are. Ontology is about stuff (dropping a hammer on your toe) and epistemology is about knowledge (how do you know that's an epic stem, Dave?).

When it comes to ontology, there's two basic positions: realism and irrealism.

It's pretty much what it says on the tin, realists think that there is a real universe out there. There's a real cat on my lap. My decision not to wear a dress is influenced by real gender structures. The other position is irrealism, which denies that there is a real universe out there. Now, most irrealists aren't irrealists about everything. They might think that there is a real cat on my knee, but that there's no reality in the social world. More on this later.

In epistemology there's also two positions. I'm going to use the terms *objectivist* and *subjectivist*, although there are definitely some positions that fall in the middle. An objectivist position assumes that there are no large barriers to producing knowledge about the world—we can just sit down, observe the world and produce truthful knowledge. A subjectivist position is more sceptical. They might argue that our knowledge could be wrong, ie our knowledge is fallible. They also might question if we really can just sit down and observe the world in some neutral and objective way. Instead, subjectivists argue that all our observations are *theory-dependent*.

Let me explain what the *theory dependency* of observation means through an example. It's always easier to use a real-world example to chat about this kind of stuff.

*Okay imagine that you're a researcher looking at how refugees are treated in the UK. An objectivist assumes we can just go out into the world, observe how refugees are treated, then write up our findings. That's all there is to it. However, a subjectivist would say that's way too simple. Who we consider to be a 'refugee' is theory-dependent, not neutral and objective. Some theories might make a big distinction between 'economic migrants' and 'refugees'—the former are apparently migrating for economic benefits, whereas the refugees were forced to flee for political reasons. Whereas other theories might question this simple binary and argue a refugee is anyone who has fled their home country, for whatever reason. The latter approach therefore defines 'refugee' much more broadly.*

*This definition could have super important consequences for the research. Imagine if the UK treats those fleeing for political reasons reasonably well, but is pretty inhumane to those fleeing due to economic factors. If we only look at the former, this would miss the inhumane treatment of the latter. In this way, there's no neutral position from which to produce knowledge.*

Phew. I think we all need a break after that.

Did you know that the fastest penguin can swim at speeds of up to 22 miles per hour? That is one speedy penguin.

Okay, break over. Let's get back to it.

When we put all this together, any philosophical position needs to pick an ontology and an epistemology. You need to pick *realism* or *irrealism*, *objectivism* or *subjectivism*. Then, bingo, you have a philosophical position. It might not be a good philosophical position, but it is a philosophical position.

We can use this framework to understand all of the other philosophical positions. All we need to work out is:

- Is it *realist* or *irrealist*?
- Is it *objectivist* or *subjectivist*?

Obviously, this means there's four possible combinations:

1. Realist|Objectivist
2. Realist|Subjectivist
3. Irrealist|Objectivist
4. Irrealist|Subjectivist

I'm going to call these:

1. Positivism (Realist|Objectivist)
2. Critical Realism (Realist|Subjectivist)
3. Very Very Confused (Irrealist|Objectivist)
4. Constructivism (Irrealist|Subjectivist)

We can basically ignore Number 3. It makes no sense to be irrealist, and think we can produce objective knowledge. How could we produce objective knowledge about something that doesn't exist? Let's get rid of that combination.

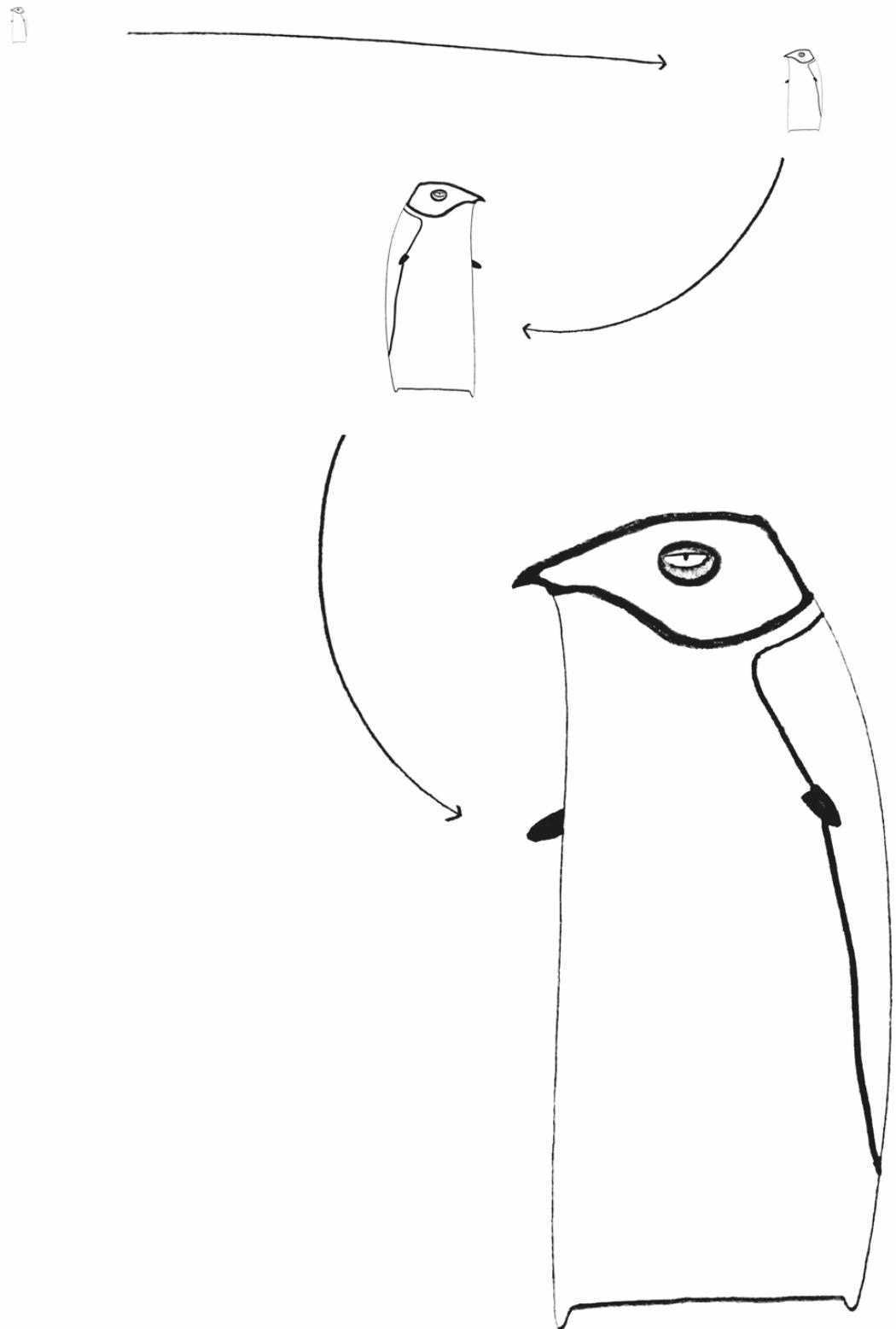
This means all those complicated terms that you've heard can basically be boiled down to: *positivism*, *constructivism*, and *critical realism*.

That's it. Just those three terms.

In the next section, I'm going to explain each of these positions, before arguing in Section 4 that everyone should be a critical realist.

#### Key points

- A philosophical position is made of ontology (realism or irrealism) and epistemology (objectivism or subjectivism).
- This results in three different philosophical positions:
  - Positivism – realism and objectivism
  - Critical realism – realism and subjectivism
  - Constructivism – irrealism and subjectivism.



A speedy penguin

## Section 3: What is positivism, constructivism and critical realism?

We've seen how you only really need three basic philosophical positions to broadly understand the field of ontology and epistemology. In this section, I'll tell you what each of these are, and how they tend to influence social science research.

### Positivism

The first philosophical position is positivism, which takes a realist/objectivist stance. It assumes:

- The world consists of real stuff, specifically *universal laws*.
- We produce knowledge in objective ways.

Okay, let's start with the ontological assumption that the world has real universal laws. What does this mean?

A universal law is basically a statement about how two events are related to each other.

I'm sure you've seen loads of examples of this in social science. Here's some made-up ones:

- Gender predicts 12.489% of the variation in mathematics scores at age 16 in England ( $p<0.05$ ).
- Family socio-economic status is a significant predictor of the likelihood of committing a crime, with an effect size of 23.8977469% ( $p<0.01$ ).
- The habit of drinking directly from the kettle predicts 0.1% of the variation in burns victims ( $p<0.1$ ).

The problem with positivism's ontology is that universal laws between events don't exist, and this is such a shallow approach to causation.

Let me try and explain this through the example of gender and maths scores. Maths scores might be influenced by a tonne of different things, from the quality of your teaching to your confidence, from the educational background of your parents to whether you consistently go to school hungry. Even if gender is one of the things that influences your score, it could interact with all these other factors in complex ways. Gender might interact with confidence, if girls are discouraged from grappling with problems 'Don't worry about it Love, maths just isn't your thing'. Gender might also interact with parental educational background, if students from less privileged backgrounds are more likely to have mothers who weren't encouraged to study maths, cementing the idea that it's not for girls. Gender could have similar interactions with teaching quality (the teacher focuses mainly on boys), hunger (being hungry might be a tipping point for some girls who were already discouraged) and any other factor. All this varies from person to person, from context to context, and makes it impossible to quantify a universal law about gender and maths scores. This just isn't what the world is like. It's the wrong ontology. It's like searching for unicorns.

Also, trying to find a universal law linking gender and maths scores is a really shallow perspective on causation. If you find an association between gender and maths scores this tells you absolutely nothing about why, or in what ways, gender influences test results. We've no idea if this is all due to gendered expectations of teachers, a lack of role models or even some biological factor. Finding an association tells us diddly-squat about why these events are linked. In fact, this association between events doesn't even show us that gender

is causal—all it shows is a correlation. And as the saying goes, correlation doesn't imply causation.

So, research that seeks out these universal laws or correlations of events isn't good enough. Instead, research should tell us about causes and how they lead to the events that we observe.

The second problem with positivism comes from its objectivist epistemology. It assumes that we can simply observe the world and produce knowledge about universal laws. This fails to recognise how our observations are theory-dependent. Think back to the refugee and economic migrant example. By ignoring the ways that research is theory-dependent—eg drawing on a theory to conceptualise what it means to be a 'refugee'—positivistic methods misrepresent knowledge production. We don't simply observe the world from some objective stance and produce knowledge. One consequence of this mistake is that positivism doesn't recognise the need for reflection in the research process. We need to think about the theories we are using, where they came from, who they benefit, and who they exclude. This is our responsibility as social science researchers.

### Constructivism

The second philosophical position is constructivism, which takes an irrealist|subjectivist stance. It is:

- Largely irrealist, ignoring (less extreme constructivism) or denying (extreme constructivism) the reality of big chunks of the world.
- Subjectivist, seeing knowledge production as *fallible* and *theory-dependent*. Extreme constructivism might go even further and argue that knowledge is *theory-determined*.

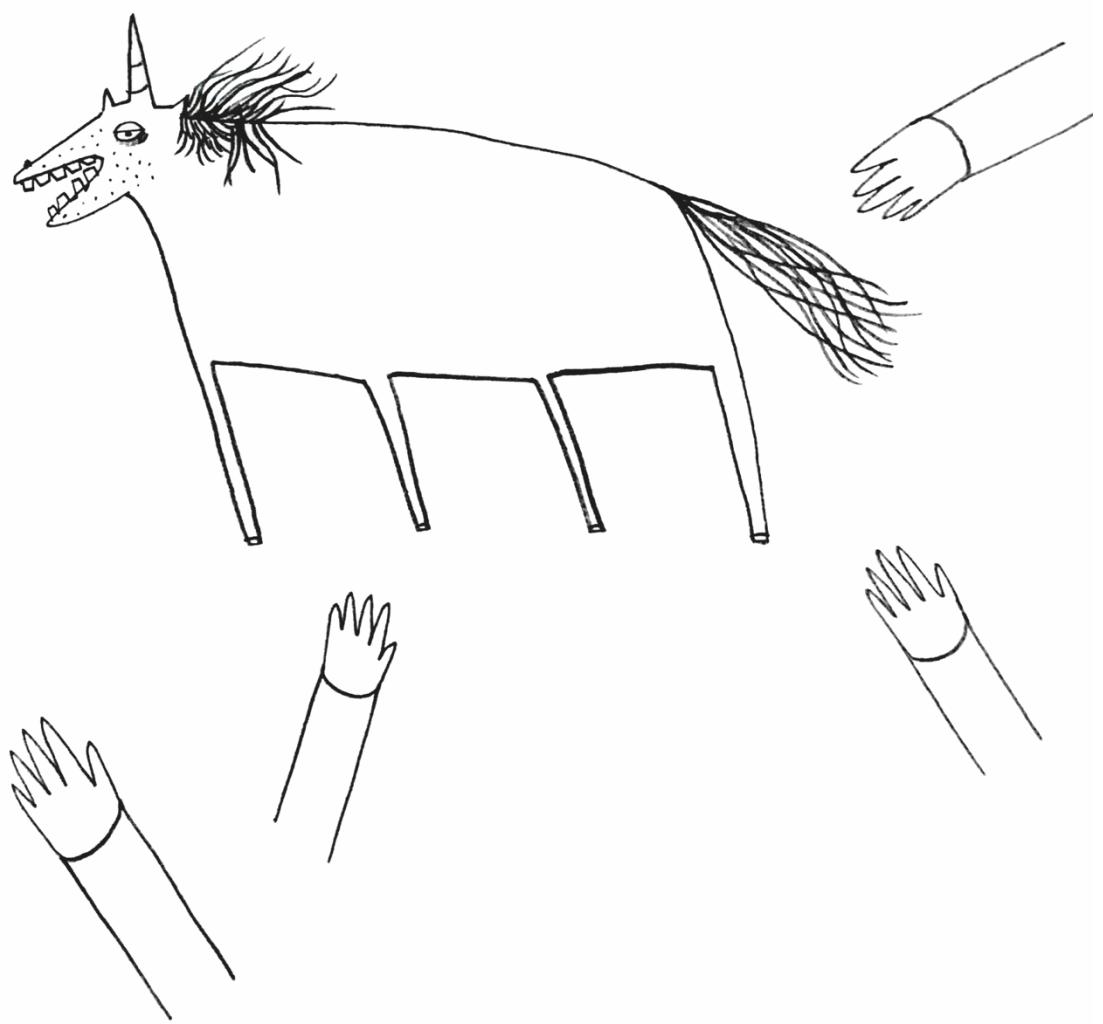
In one sense, constructivism takes a big step forward from positivism. It fully acknowledges that it makes no sense to go looking for universal laws.

However, the problem with constructivism is that it goes too far in its critique. It becomes too pessimistic about our ability to produce knowledge about the world.

In the social sciences, constructivism tends to influence studies by encouraging them to focus on *discourse*, *meaning* or the *experiences* of people. This is not a false ontology in the same sense as positivism—constructivism doesn't go searching for things that don't exist. The problem is that constructivism takes too narrow of a perspective on the world.

It's less a wild unicorn chase, and more a belief that you're only taking the dog-lead for a walk, rather than the dog. It's like implying that Aldi only sells carrots.

I'm sure you've come across studies that focus on the *experiences* of people. Often these studies talk about 'giving voice' to an under-represented group. You see this in anthropology quite a lot, but it is common in other disciplines as well.



*Searching for universal laws*

Now, the idea that we should listen to the voices of marginalised groups is a very important one, it's a big step forward from more positivistic studies that would think people's opinions are useless. Think about a study of poverty, it's essential to understand the worldview of people in your research project, rather than designing an intervention without understanding and engaging with this social context.

However, the endpoint of research isn't the collection of stories and worldviews. While it is important to ask people's opinions about things, research shouldn't end there. A study of poverty isn't complete when we understand the experience of someone in poverty. We need to find the causes of why people are in this position and how these barriers could be transformed, building on the lived experiences of people.

Philosophical constructivism can hinder the latter steps in the research process—ie the movement from stories to causes. I say 'philosophical constructivism' because I reckon if you asked most social science researchers who identify as 'constructivists' about their work, they'd say that they do believe in causes and they hope their research will help to overcome some of the barriers people face. In this way, they're not a full philosophical constructivist.<sup>1</sup> To me, although few social science researchers are actually philosophical constructivists, this position can influence social science research by encouraging us to stop too early in the research process. We've got to go beyond discourse and experiences to also look at causes.

Imagine a study that analyses the ways refugees are represented in discourse—whether linking refugees to diseases or the ways in which a binary is created between refugees and economic migrants—this is good and important research. The problem is when the analysis stops here. We still need to ask questions like:

- What impact does this discourse have in the world?
- In what ways do refugees suffer because of this discourse?
- To what extent do important people (politicians, visa officials, border police) adopt and internalise this discourse and how does this influence their actions?

The fact that there is a discourse does absolutely nothing to show the impact of discourse in the world. It is up to researchers study the impact and consequences of this discourse.

Philosophical constructivism denies that this is possible or even desirable, which wrongly discourages researchers from taking this next vital step.

You might be wondering its possible to justify the idea that constructivism takes too narrow an ontology by only focussing on discourse and language. To do this, I need to show you the way that social structures and causes are real, and can be studied by social science.

*When I go to watch Bolton Wanderers versus Manchester United, as a Bolton fan I tend to avoid wearing a red t-shirt as this colour is associated with Manchester United. When I'm deciding what to wear on a particular Saturday morning, I cannot escape the association of red and Manchester United. This social structure pre-exists my activity at a given point in time and has a causal impact on my behaviour, ie I tend not to wear red.*

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<sup>1</sup> Roy Bhaskar, the founder of critical realism, says that constructivists tend to commit 'an epistemic fallacy', where ontological claims about being are reduced to epistemological claims about knowledge (Bhaskar 1975). A constructivist may explicitly or implicitly deny that the world is real (an ontological claim), because they are sceptical of our ability to produce knowledge about the world (an epistemological claim). But this mistakes the reality of the world, with our knowledge of it.

I know social structures are real because of the causal impact they have on my behaviour. Just like I can know a magnetic field is real by the causal impact it has on iron filings, the same applies to social structures. The association of red and Manchester United isn't something that only exists in my head—some football stadiums won't even let you in the ground if you wear the colour associated with the other team. There really is a social structure that exists—social science is the study of their (trans)formation and impact.

I also mentioned that some extreme forms of constructivism take a problematic epistemological stance. They argue that knowledge production is *theory-determined*, not merely *theory-dependent*. This denies that the world can influence our theories, and ends up with complete relativism—there's no way of saying one theory is better than another.

Imagine you go to the pub and the bloke at the bar start telling you about how babies are brought by a flying stork after being made in a secret lake. That is one theory you could hold about human reproduction. But, just because this fella believes this theory, this doesn't make the world that way—his theory does not *determine* whether babies really are formed in a secret lake. Our observations might be dependent on our theories, but our theories definitely don't completely determine what reality is like.

### Critical Realism

So, if positivism goes chasing unicorns, and constructivism is adamant it only takes the dog-lead for a walk, what does critical realism bring to the table?

Critical realism builds on both of its rivals. It acknowledges that the world is real, and that knowledge production is fallible and theory-dependent but not theory-determined. It's also happy to say that meaning and discourse are important, but they're not the only things that exist.

I'm actually going to tell you more about this in the next section, and I'll try to make the case for why you should be a critical realist.

But, let me end with a quick rant about 'pragmatism'.

There's a school of social theory in the US called 'pragmatism'. This isn't what I'm talking about. I'm talking about 'pragmatism' as the belief that philosophical questions of ontology and epistemology don't matter for researchers.

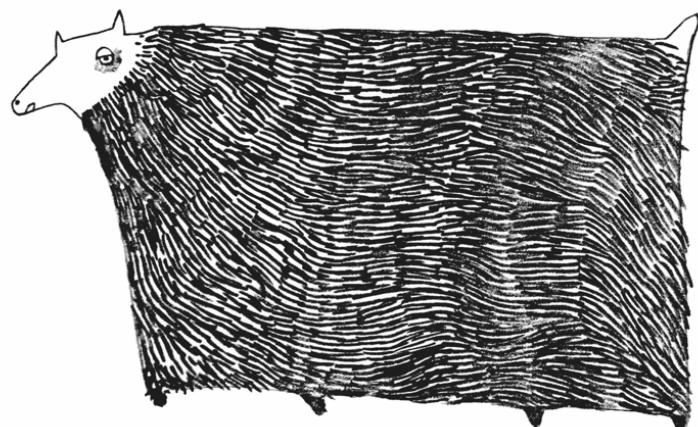
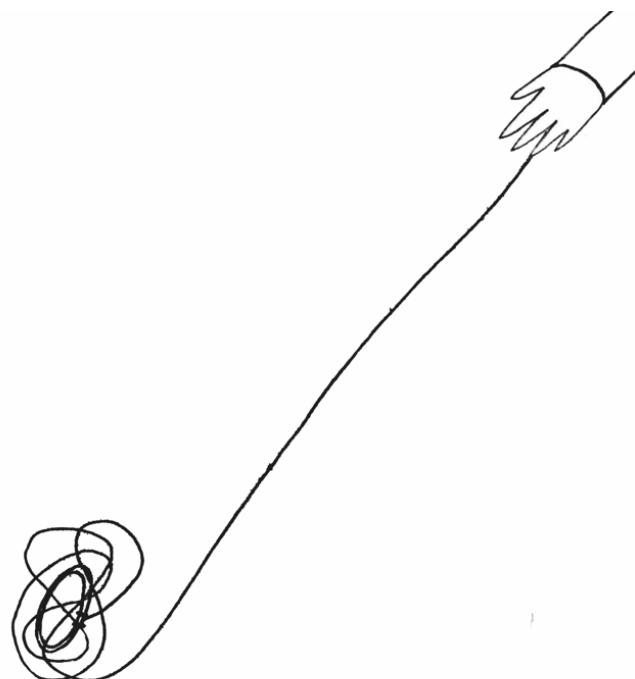
You'll often hear pragmatists say things like "It's okay to adopt whichever philosophical position you want. All you need to do is to make sure it's consistent". If I was a betting man, I'd guess that most methods training in universities tend to adopt this pragmatist position. In some ways this makes sense, if you have a class full of researchers from very different disciplines. In other ways, this is utter rubbish.

I hope you can see why. Without a decent theory of ontology and epistemology you could go looking for stuff that doesn't exist, or you could end up accidentally ignoring a big chunk of the world. Being consistent doesn't make these problems go away.

What we need is the best philosophical position, not just one that we apply consistently. I think this is critical realism.

Key points

- Positivism goes looking for universal laws that don't exist. It gives a very shallow perspective on causation.
- Constructivism encourages researchers to only consider meaning and discourse. We must go further to look at causes, social structures and the impact of discourse.
- Pragmatism (not the US school) is utter rubbish.



*Taking a dog-lead for a walk*

## Section 4: Why everyone should be a critical realist

Okay, so what is this critical realist philosophical position that I've been banging on about? And why is it the best theory of ontology and epistemology?

Let's start with the second question.

Critical realism is the best theory of ontology and epistemology because it reaches its conclusions through a really powerful method called retroductive reasoning.

Don't worry, retroductive reasoning isn't as complicated as it sounds. It's basically a kind of logic that looks for the best explanation. Say you just put some chocolate on the table next to your baby, and then a minute later the chocolate has gone and Little Billy has chocolate smeared round his face. What's the best explanation for this? We'd be justified in concluding that 'Little Billy ate the chocolate'.

Roy Bhaskar, the founder of critical realism, used exactly the same kind of reasoning to work out what the ontology of the world must be like. If you want a couple of references, his first two books are *Realist Theory of Science* (1975) and *Possibility of Naturalism* (1979).

He asked: *what must the ontology of the world be like in order for scientific experiment to be possible?*

Okay, so Bhaskar starts with the assumption that scientific experiment can produce knowledge. He's thinking particularly of experiments in the natural sciences at this point. Now this really isn't too controversial. If you don't tend to eat arsenic for tea and generally try to avoid sticking your fingers in plug sockets then you're probably okay with the idea that scientific experiment can produce knowledge.

Just like we asked, 'What is the best explanation for how the chocolate disappeared?' we're now asking, 'What is the best explanation for how scientific experiment can produce knowledge?'. Or, 'If scientific experiment is possible, what must the ontology of the world be like?'.

If anyone wants to see this written in some formal logic, here you go:

Major Premise	<b>Only if Q, then P.</b>	<b>Only if</b> the world has ontological properties X, Y and Z, <b>then</b> scientific experiment is possible
Minor Premise	P	Scientific experiment is possible.
Conclusion	<b>Therefore, Q</b>	<b>Therefore</b> , the world has properties X, Y and Z.

I'll explain what the ontological conclusions X, Y and Z are in a minute.

The reason why critical realism is the best theory of ontology and epistemology is because of the strength of this retroductive argument. There are only a few ways it could be faulty. We've already seen that it's a bit daft to argue that the minor premise is wrong, we all live our lives in ways that acknowledge that scientific experiment is possible and does produce knowledge.

The other main way that critical realist conclusions could be wrong is if there's some dodgy reasoning in the major premise. It's definitely possible that there's some problems here, but this wouldn't make critical realism useless. To correct a mistake in the major premise would only make critical realism a better account of the world! Critical realism's a bit like the hulk getting angrier, the more you correct or add to the major premise the stronger it gets...

That definitely doesn't work perfectly as an analogy, but you get the idea.

Neither positivism or constructivism have an underlying method like this retroductive reasoning. This is part of the reason why positivism ends up trying to find universal laws, which don't exist. Similarly, constructivism has some real insights on the ways in which knowledge production is subjective, but runs into problems when this critique is taken too far—whether in denying the reality of big chunks of the world, or arguing that knowledge is theory-determined. All this means these philosophical positions aren't able to give as good an account of ontology and epistemology as critical realism.

I wanted to share this 'method' of critical realism to give some sense of where its conclusions come from. However, it's beyond the scope of this guide to show you how critical realism uses this method to reach its conclusions. I thought it would be more useful to focus on two of the main conclusions of critical realism, which I think are particularly important for social science researchers:

1. Research should look for causal tendencies.
2. Social science research must consider both agency and structure.

Again, there's loads more to critical realism than these two conclusions, but this guide isn't aiming to give a complete introduction. There's already great examples like: Collier (1994) *Critical Realism: An Introduction to Roy Bhaskar's Philosophy* or Gorski (2013) *What is Critical Realism? And Why Should You Care?* Do check them out.

### Research should look for causal tendencies

We've already seen that positivism looks for universal laws, which don't exist. And, constructivism looks for stories and tends to deny that anything else exists.

Critical realism takes a different approach. It goes looking for causal mechanisms that act as tendencies.

That might sound like a jumble of words, so let me try to explain. To do this, I need to introduce some critical realist theory that argues the world has three domains:

- Domain of the Empirical – containing *experiences*, ie the events we experience.
- Domain of the Actual – containing *events*. Not all events are experienced, eg a tree falls even if no-one is around to see it.
- Domain of the Real – containing *causal mechanisms*. Mechanisms are the structures that cause events, eg the gravity that caused the apple to fall on Newton's head.



*Little Billy and his chocolate*

This idea that the world has three domains gives us a different way of understanding the mistakes of positivism and constructivism. Positivism looks for causes in the domain of the actual, instead of the domain of the real. Constructivism recognises causes aren't in the domain of the actual, but denies that the domain of the real exists. Critical realism is the only position to recognise that research should look for causes in the domain of the real.

Let's jump back to the example of gender and maths test scores to see this in more detail. Okay so, the score that students get in a mathematics exam is an event. Critical realism asks 'how can we best explain this event?' or 'what are the causal mechanisms that caused this event?'. This pushes us to ask whether gender structures cause or influence maths scores. And, if gender structures do tend to influence scores, how do they do this? Do they work through influencing someone's confidence so they give up on problems quickly, through a lack of attention from teachers due to gendered expectations, through influencing learner identities of students, or all of the above. Hopefully you can see this isn't going to be easy. But research isn't easy stuff! In contrast, positivism makes a failed attempt to find a universal law between events, asking 'what's the universal law connecting gender and maths scores?'. Similarly, constructivism ignores causes and is content to describe people's experiences of maths and go no further in the research process.

This example also shows that causal mechanisms act as *tendencies*. Because there's no universal impact of gender on maths score, all we could conclude is that there's a tendency. For example, if a study concluded that girls *tend* to perform less well in maths, this doesn't allow us to perfectly predict maths scores in the future. There's only a tendency.

Critical realism shows that our research must, at least in part, look at causal mechanisms and how they act as tendencies to influence the world we observe.

### Social science research should consider both agency and structure

Critical realism also uses retroductive arguments to show that both agency and social structures are real. They are both ontological features of the world and they exist together in a relation. This is the second big conclusion of critical realism I'll talk about.

If you want to adopt a social theory that doesn't allow for agency—eg some interpretations of Bourdieu's theory of habitus can exclude all agency—then critical realism shows this is a mistake. If you're researching anything in the social world, we have to think about agency.

At the same time, critical realism shows that social structures are real. They're real in the sense that social structures influence individual agents, whether their behaviour, identities, knowledge or actions. The world doesn't just consist of individuals who wander around acting freely. Instead, the world has individuals, and the world has social structures that emerge from these individuals as they act together. Again, critical realism shows it's not cool to only consider individuals in our social theories—say some versions of rational choice theory in economics that only look at individuals maximising an outcome. This is a flawed model of the world, as it ignores the impact of social structures on individuals—we aren't free individuals making completely individual decisions.

Critical realism does more than just show us that our social theory must account for both agency and social structures. We must look at the two of them together.

Social structures influence the actions of individuals. Individuals can then reproduce or transform these social structures through their actions. These social structures then influence the future actions of individuals... and so on and so on and so on.

Think back to the example of t-shirts and football games, social structures and individuals have to be considered together, as they influence each other:

*When I go to watch Bolton Wanderers versus Manchester United, as a Bolton fan I tend to avoid wearing a red t-shirt as this colour is associated with Manchester United. My decision not to wear a red shirt is influenced by this pre-existing norm. Through my agency I have some choice over whether I attempt to transform (wear a red shirt as a Bolton fan) or reproduce (stick to blue or white t-shirts) this structure through my action. In turn, my action could influence or strengthen the norm that red is association with Manchester United.*

In this way, social structures and individual agency exist together. We must consider them together in our research. If we don't do this we're making an ontological mistake.

Well folks, we've reached the end of the road.

I hope this guide has helped introduce you to this area and gives you a way to navigate your way through questions from people about your ontology and epistemology. Also, for any keen beans I hope this is the start of you getting to know critical realism.

Let me leave you with this. When you turn to your research, just ask yourself:

1. Which philosophy underlies my research?
2. Does my research look for causal mechanisms that act as tendencies?
3. Have I considered both structure and agency?

If you ask these three questions, you're well on the way to a great project. Best of luck with it!

#### Key points

- Critical realism is the best theory of ontology and epistemology, using a powerful kind of retroductive argument to reach its conclusions.
- Conclusion 1: we should seek causal mechanisms that act as tendencies, rather than universal laws or only stories.
- Conclusion 2: agency and social structures are ontological features of the world, and they exist relationally. We must use social theories that accept this ontology.



The Hulk

## Glossary

Term	Definition
Ontology	The study of stuff, or the study of being.
Epistemology	The study of knowledge.
Philosophical position	Every philosophical position has an ontology (realist or irrealist) and an epistemology (objectivist or subjectivist)
Realism	An ontological position that says there is a world that is (at least in some way) independent of the researcher.
Irrealism	An ontological position that says there is not a world that is (in any sense) independent of the researcher.
Objectivism	An epistemological position that says we can simply observe the world and produce knowledge.
Subjectivism	An epistemological position that says we cannot simply observe the world and produce knowledge. Instead, knowledge production is theory-dependent or theory-determined.
Theory-dependent knowledge production	A view that knowledge production is influenced by the theories that a researcher adopts.
Theory-determined knowledge production	A view that knowledge production is completely determined by the theories that a researcher adopts. This results in the view that all knowledge is equally valid.
Positivism	A philosophical position that is realist objectivist.
Constructivism	A philosophical position that is irrealist subjectivist.
Critical realism	A philosophical position that is realist subjectivist.
Causal mechanism	The cause of an event. These exist in the <i>domain of the real</i> .
Tendency	Causal mechanisms act as tendencies not universal laws, eg <i>gender tends to influence maths scores</i> .