Notes on Knowledge and Skepticism

Schick & Vaughn (2005), Chap. 5

1. What is knowledge?

Not "justified through belief"!

Plato (*The Meno*): Knowledge is *justified true belief*.

<u>*In other words*</u>: To know p means:

(a) You believe that p is true.

(b) p is true.

(c) You are justified in believing that p is true.

<u>*Claim 1*</u>: True belief, (a) & (b), is *necessary* for knowledge.

<u>*In other words*</u>: If p is knowledge, then p is a true belief.

<u>*Aside*</u>

To say "x is necessary for y" is to say "if y, then x".

- <u>*Ex*</u>: To say "oxygen is necessary for fire" is to say "if there's a fire, then there's oxygen" (but not necessarily *vice-versa*!).

To say "x is sufficient for y" is to say "if x, then y".

- <u>*Ex*</u>: To say "a struck match is sufficient for fire" is to say "if there's a struck match, then there's fire" (but not necessarily *vice-versa*!)

To say "x is both necessary and sufficient for y" is to say "if x, then y, and if y, then x".

- <u>*Ex*</u>: To say "making a touchdown at time t in football is necessary and sufficient for adding 6 points to your score at time t in football" is to say "if you make a touchdown at time t, then 6 points are added to your score at t, and if 6 points are added to your score at t, then you've made a touchdown".

<u>*Why true belief is necessary for knowledge*</u>

Arguably, to say that you know p requires that you believe p to be true.

- <u>*Ex*</u>: If you know that $2+2=4$, then you can't believe $2+2=4$ is false.

And: To say that you know p also requires that p be true.

- <u>*Ex*</u>: $2+2=5$ doesn't count as knowledge. You can't say that you *know* $2+2=5$.

Claim 2: True belief, (a) & (b), is not *sufficient* for knowledge.
In other words: It's not necessarily the case that if *p* is a true belief, then *p* is knowledge.

Why true belief is not sufficient for knowledge

Arguably, if you believe *p*, and *p* is true, it may not be the case that you know *p*.

- *Ex*: Suppose your crystal ball tells you it's raining in San Francisco, and this leads you to believe that it's raining in San Francisco. Now suppose this belief is true: it actually *is* raining in San Francisco. Then you can't really be said to know that it's raining in San Francisco.

So: While true belief is required for knowledge, knowledge requires more than just true belief.

> *Plato*: "True opinions [i.e., beliefs] are a fine thing and do all sorts of good so long as they stay in their place, but they will not stay long. They run away from a man's mind, so they are not worth much until you tether them by working out the reason.... Once they are tied down, they become knowledge."

Hence: Knowledge is *justified* true belief.
Or: Justified true belief is both necessary and sufficient for knowledge.

So: If you *believe* that it's raining in San Francisco, and it really *is* raining in San Francisco, and you are *justified* in believing it's raining in San Francisco (reading a reliable weather report, say, as opposed to consulting a crystal ball), then you can claim that you *know* that it's raining in San Francisco.

Two Remaining Issues:
(a) Is justified true belief sufficient for knowledge?
(b) What are the criteria for justification?

2. Is Justified True Belief Sufficient for Knowledge?

Claim: There can be scenarios in which you believe p, p is true, and you are justified in believing p, but you don't really know p.

> *Aside*: These scenarios are called "Gettier counterexamples" after a 1963 essay by Edmund Gettier.

Example: You are driving by a field in the countryside in which there appears to be a sheep grazing in the distance next to a large rock. You take this as evidence that there's a sheep in the field, so you form the belief, call it p, "There is a sheep in the field".

But: What you think is a sheep is really a sheepdog (which looks very much like a sheep, especially from a distance).

And: Unknown to you, there is a sheep hiding behind the rock that you can't see.

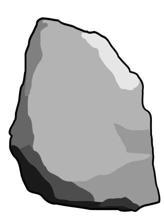
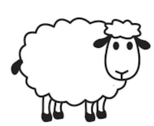
So:
- (a) You believe p ("There is a sheep in the field") is true.
- (b) p ("There is a sheep in the field") is true.
- (c) You are justified in believing p ("There is a sheep in the field") is true.

Hence: p is a justified true belief.

But: Do you *really* know p? (You're mistaken in thinking the object you see in the field is a sheep, and you have no reason to believe there's a sheep hiding behind the rock.)

Possible response: Maybe you're not *really* justified in believing there's a sheep in the field, simply on the basis that you perceive there's a sheep in the field.

Question: Under what conditions can you be said to be justified in believing there's a sheep in the field? *What are the criteria for the justification of beliefs?*

3. What Are the Criteria for Justification?

Possible candidates:

(a) *Certainty*

A true belief p is justified just when you have reasons that establish it with certainty, beyond a shadow of a doubt.

Suppose we're *empiricists*: we think knowledge is based entirely on experience.

Then: Certainty as a criterion for knowledge is problematic:

> *Inductive skepticism* (Hume)
> How is knowledge of the future based only on past experience possible?

And even worse:

> *External world skepticism*
> How is knowledge of the source of our experience possible? How can we know anything behind the sense data of experience?

Maybe we should give up empiricism and become *rationalists*; *i.e.*, claim that some knowledge can be obtained through pure reason alone.

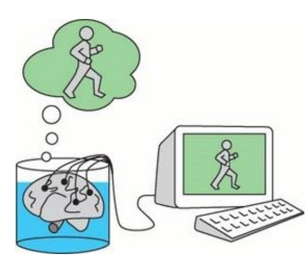
Descartes' Claim: There is only *one* thing that you can know for certain: "cogito ergo sum" ("I think therefore I am").

According to Descartes: Any other claim can be reasonably doubted ("I'm awake", "I'm reading this boring lecture", "I'm a human being living on a planet orbiting a star in an average-sized galaxy in the universe", *etc.*).

How so?: Because, ultimately, you can never be completely certain that your mind is not being manipulated to produce any experience you may be having.

Maybe you're just a disembodied brain in a vat of nutrients in an alien scientist's laboratory hooked up to a computer that stimulates the brain in various ways to cause it to have "experiences" of an external reality.

Maybe "certainty" is too strong a criterion for justification...



(b) *Reliability*

A true belief p is justified just when p has been produced by a reliable method of inquiry.

A reliable method of inquiry is a method that may initially produce incorrect results, but *eventually* stabilizes to the truth.

Note: It need not be the case that we ever know with certainty whether a method is reliable. To be reliable, all a method has to do is stabilize to the truth at some point. It doesn't have to give a sign to the user when this occurs. (For all the user knows, a reliable method could at some point in the future cease to be reliable.)

Recall: Hume's argument against induction assumes that *certainty* is the standard of success for a method of inquiry. He argues that we can never know *with certainty* whether an inductive method is successful.

Here's *one* way to make the certainty/reliability distinction slightly more concrete:

Set up:

- Let $C(e, h)$ be a "correctness" relation that says "hypothesis h is correct for data stream e". *(Think of a data stream e as an infinite sequence of pieces of evidence e_1, e_2, e_3, ..., etc.)*
- Let $\alpha(h, e|_n)$ be a method of inquiry that takes a hypothesis h and a finite data sequence $e|_n = (e_1, e_2, ..., e_n)$ as input, and outputs either a "1", meaning "h is acceptable given $e|_n$", or a "0", meaning "h is not acceptable given $e|_n$".

Using "certainty" as a standard of success

1. α verifies h with certainty on e *if and only if*

   there is an n such that ($\alpha(h, e|_n) = 1$ and $\alpha(h, e|_{n+1})$ = "finished") *if and only if* $C(e, h)$.

2. α refutes h with certainty on e *if and only if*

   there is an n such that ($\alpha(h, e|_n) = 0$) and $\alpha(h, e|_{n+1})$ = "finished" *if and only if* $\neg C(e, h)$.

The requirement that $\alpha(h,e|_{n+1})$ = "finished" *lets the user knows for certain that the method has reached its conjecture.*

Using "reliability" as a standard of success

1. α verifies h in the limit on e *if and only if*

   there is an n such that for each later $m > n$, $\alpha(h, e|_m) = 1$ *if and only if* $C(e, h)$.

2. α refutes h in the limit on e *if and only if*

   there is an n such that for each later $m > n$, $\alpha(h, e|_m) = 0$ *if and only if* $\neg C(e, h)$.

Again: The reliability standard allows a method α to succeed (converge to the right answer) *without* requiring it to signal to the user exactly when it's succeeded.

Also: You can show that there are some hypotheses that cannot be verified or refuted with certainty, but can be verified or refuted in the limit.

(c) *Best Explanation*

A true belief *p* is justified just when *p* provides the best explanation.

This is Schick and Vaugh's (2005, pg. 119) suggestion: "A proposition is beyond a reasonable doubt when it provides the best explanation of something."

But: What counts as an explanation? (Deductive-Nomological? Unifying? Causal?) And what counts as the *best* explanation?

(d) *Coherence*

A true belief *p* is justified just when *p* belongs to a system of beliefs that is mutually supportive.

> *Foundationalism*: Some basic beliefs are self-justifying. All others are justified only if they are supported by the basic beliefs.

> *Coherentism*: No beliefs are self-justifying. Any belief is justified to the extent that it belongs to a system of beliefs that is mutually supportive (*i.e.*, coherent).

Concern: Coherentism doesn't seem to be able to distinguish between beliefs that we might warrant and those that we might consider misguided.

> *Schick & Vaugh's example of the Branch Davidian cult. "A fairy tale may be coherent, but that doesn't justify our believing it."*

On the other hand: The foundationalist intuition that there are basic facts (that underwrite the basic beliefs) doesn't seem warranted from the point of view of the history of science: What were considered basic facts according to Aristotle's theory of motion are not considered basic facts according to Newton's theory of motion (and similarly for Newton's theory and Einstein's theory).

Also: A coherent system of beliefs can be "self-correcting". Slight corrections to any belief in the network may lead to greater coherence and greater reliability.

Many types of mathematical approximation techniques have this feature...

Example of self-correcting approximation technique: Newton's Method

Task: Given a function $f: \mathbb{R} \rightarrow \mathbb{R}$ and its derivative f', find a root of f.

A value x_r such that $f(x_r) = 0$.

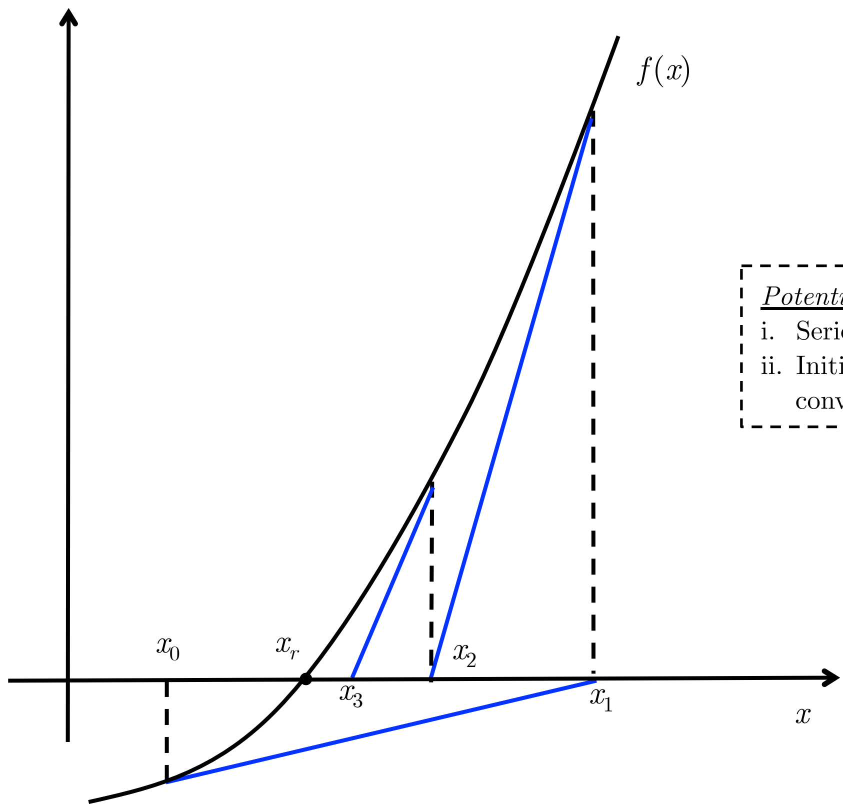
Procedure:

1. Make an initial guess x_0.

2. Construct a series $\{x_0, x_1, x_2, ... \}$ where $x_{n+1} = x_n - f(x_n)/f'(x_n)$.

3. Truncate series when $|x_{n+1} - x_n|$ falls within a given tolerance.

4. *Claim*: For a given n, x_{n+1} sufficiently approximates the root x_r.



Potential problems:

i. Series $\{x_0, x_1, x_2, ... \}$ doesn't converge.

ii. Initial guess is outside interval of convergence.

- When it works, the method doesn't produce the exact value of x_r; just better and better approximations x_0, x_1, x_2, x_3, ..., *etc.*, of it.
- A self-correcting coherent scheme that reliably approximates the "truth" (*i.e.*, the value x_r).
- Maybe this is all we can hope for...