NEW WORK FOR CERTAINTY

Bob Beddor
National University of Singapore

11 · 8 · 19

Outline

Subjective vs. Epistemic Certainty

(1) I'm certain that the butler did it. Subjective

(2) It's certain that the butler did it. Epistemic

—Moore [1959]; Stanley [2008]; DeRose [2009]; cf. Unger [1975]

Subjective vs. Epistemic Certainty

Normative Link

A proposition p is epistemically certain for A iff A ought to be subjectively certain that p.

(3) # { It's certain / I'm certain } that the butler did it, but { I'm not certain / it's not certain } he did it.

Outline

Assimilating Certainty to Knowledge?

An initially tempting proposal:

Epistemic certainty = knowledge
Subjective certainty = the level of confidence required for knowledge

Against Assimilating Certainty to Knowledge

First Data Point

"Knows for certain" isn't redundant

(4) What can we know for certain/with certainty?

(5) What can we know?

Not merely a quirk of English…

(6) So per certo che Ronaldo non giochera' la prossima partita
I know for sure that Ronaldo not will play the next game
'I know for sure that Ronaldo will not play the next game'

(7) Bine, dar stii tu sigur ca vine maine?
OK, but know you sure that she's coming tomorrow?
'OK, but do you know for sure she's coming tomorrow?'

(8) Tetapi anda tidak tahu dengan pasti.
But you do not know with certainty.
'But you do not know for certain.'

(9) na.nun pi-ga o.go-it'a-nun.kos-ul hwakʃɾ-i an-da.
I rain falling certain know.
'I know for certain that it's raining'

Against Assimilating Certainty to Knowledge

Second Data Point

Natural language ascriptions of knowledge without certainty

(10) When [a false ID] is handed to a cop, he knows with near certainty the guy before him is not the guy identified on the flimsy piece of paper.[1]

(11) [W]e know without certainty, but with a high degree of probability, that returns over the next 10 years or so will be very poor.[2]

(12) We now know with near-certainty that Russia did this with the goal of electing Trump.[3]

[1] Geeting, *Truckers and Troopers*, p.96

[2] `http://www.smithers.co.uk/news_article.php?id=16&o=50`.

[3] Chait, 'Trump, McConnell, Putin, and the Triumph of the Will to Power", *New York Mag*

Against Assimilating Certainty to Knowledge

Third Data Point

Cases of knowledge without certainty

e.g., Radford's unconfident examinee

(13) The examinee knows that Elizabeth I died in 1603. **True**

(14) The examinee knows with certainty that Elizabeth I died in 1603. **False**

—Armstrong [1969]; Stanley [2008]; McGlynn [2014]

The Upshot

Certainty is more demanding than knowledge

- Epistemic certainty involves a stronger epistemic position than that typically required for knowledge.
- Subjective certainty involves a higher degree of confidence than that typically required for knowledge or belief.

A Model

Hintikka Semantics for Knowledge

- A knows p iff p obtains in all of A's $\mathcal{K}$-alternatives—that is, all the worlds consistent with what A knows.

Hintikka Semantics for Belief

- A believes p iff p obtains in all of A's $\mathcal{B}$-alternatives—that is, all the worlds consistent with what A believes.

Extending the Model

Hintikka Semantics for Epistemic Certainty

- p is epistemically certain for A iff p obtains in all of A's $\mathcal{E}$-alternatives—that is, all the worlds consistent with what is epistemically certain for A.

Hintikka Semantics for Subjective Certainty

- A is subjectively certain of p iff p obtains in all of A's $\mathcal{S}$-alternatives—that is, all the worlds consistent with A's subjective certainties.

Extending the Model

To capture the asymmetric entailment between epistemic certainty and knowledge, we require that the $\mathcal{E}$-alternatives are a superset of the $\mathcal{K}$-alternatives.

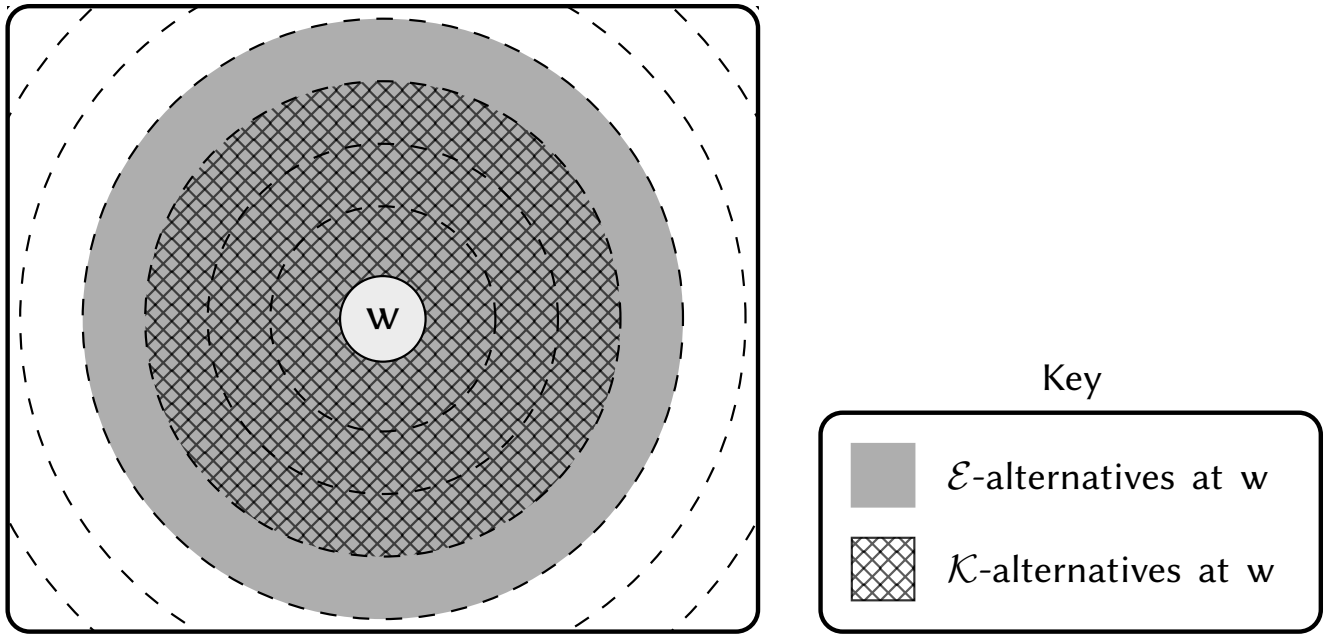

Figure: Knowledge & Epistemic Certainty

Outline

Unger's Argument

Skepticism about certainty = idea that certainty is seldom—if ever—attained.

The most well-developed argument for skepticism about certainty comes from Unger [1975].

Unger's argument starts with the premise that "certain" is a maximum-standard absolute gradable adjective ('max-adjective').

Gradable adjectives

Gradable adjectives denote functions from entities to degrees on an associated scale.
(Kennedy & McNally 2005; Kennedy 2007)

- "expensive" denotes a function from entities to degrees of costliness
- "tall" denotes a function from entities to degrees of height

Maximum-Standard Gradable Adjectives

Max-adjectives require that their arguments possess the maximal degree of the denoted property.

Maximum-Standard Gradable Adjectives

Main Diagnostic

x is A, but it could be A-er is infelicitous when *A* is a max-adjective.

(15) ? The line is straight, but it could be straighter. max

(16) ? The table is flat, but it could be flatter. max

(17) This line is long, but it could be longer. relative

(18) The building is tall, but it could be taller. relative

Applied to "certain"

Main Diagnostic

x is A, but it could be A-er is felicitous when *A* is a max-adjective.

(19) ? It's certain to rain, but it could be more certain.

(20) ? Sue is certain it will rain, but she could be more certain.

Unger's Argument

If "Certain" is a max-adjective, then p only qualifies as certain if p has the maximal degree of certainty.

But this seems a very high bar—and it seems that very little of our everyday knowledge measures up.

Take, for example, my knowledge that *Marseilles is in France*. This seems to be less certain than the tautology, *Either Marseilles is in France or it isn't*.

Reason to Doubt the Skeptical Conclusion

We don't reserve "certain" for only a tiny sliver of our knowledge:

(21) I'm/it's certain that Marseilles is in France.

(22) I'm/it's certain that I have hands.

etc.

Reason to Doubt the Skeptical Conclusion

Widespread speaker error: If Unger is right, we are almost always speaking falsely when we say something is “flat” or “straight”, etc.

A Natural Solution

Contextualist Maneuver

Hold that the extensions of max-adjectives vary with context (Lewis 1979)

- In any context, "*p* is epistemically/subjectively certain" is true iff *p* has the maximal degree of epistemic/subjective certainty for the relevant agent.
- In a context with lax standards, far more propositions count as maximally certain than in a context with strict standards.

Contexualist Hintikka Semantics

Contextualist Hintikka Semantics

- "p is epistemically certain for A" is true in c iff p obtains in all of A's c-relevant $\mathcal{E}$-alternatives.
- "A is subjectively certain of p" is true in c iff p obtains in all of A's c-relevant $\mathcal{S}$-alternatives.

Advantages

- Captures the data that motivated classifying "certain" as a max-adjective.
- Avoids the counterintuitive consequences of denying that we can be certain of anything.
- Retains the advantages of Hintikka Semantics for Certainty (e.g., captures the asymmetric entailment between epistemic certainty and knowledge)

Taking Stock

I've argued that we should resist two tendencies:

1. A tendency to assimilate certainty to knowledge
2. A tendency to insist that certainty is scarce

In doing so, we've paved the way to putting certainty to explanatory work in epistemology.

Outline

Knowledge First Account of Evidence

Williamson [2000] famously identifies evidence with knowledge

E = K

For any agent A, A's total evidence = $\{p : \text{A knows } p\}$.

Knowledge First Account of Evidence

Williamson combines E=K with the idea that the evidential probability of a proposition for an agent is its probability conditional on the agent's total evidence, yielding:

Knowledge Account of Evidential Probability

$\Pr_A(q) = \Pr_A(q \mid \{p : \text{A knows } p\}), \quad \text{where } \Pr_A(q \mid \{p : \text{A knows } p\}) \neq 0.$

Worries About E=K

Given that knowledge $\not\Rightarrow$ certainty, the following should be coherent on E=K:

(23) # The evidence entails *p*. But it isn't certain that *p*.

But such conjunctions seem incoherent.

Worries About the Knowledge Account of Evidential Probability

One theoretical role for evidential probabilities is to provide normative constraints on credences:

Credal Constraint

Your credence in p should equal p's evidential probability for you.

The Knowledge First Account of Evidential Probability + Credal Constraint $\Rightarrow$

Maximally Confident Knowledge

Everyone should have credence 1 in everything they know.

Worries About the Knowledge Account of Evidential Probability

Maximally Confident Knowledge

Everyone should have credence 1 in everything they know.

But this seems counterintuitive in precisely those cases where knowledge and certainty come apart

- e.g., the unconfident examinee shouldn't have credence 1 that Elizabeth died in 1603

—Cf. Kaplan [2009]; Greco [2013]

An alternative approach is to analyze evidence and evidential probability in terms of epistemic certainty.

Certainty and Evidence

E = C

Evidence is epistemic certainty. More precisely:

- In any context, "A's evidence" is co-extensive with "A's epistemic certainties".

Explains the incoherence of:

(24) # The evidence entails *p*. But it isn't certain that *p*.

Cf. Greco [2017] on the advantages of contextualism about evidence.

Certainty and Evidential Probability

We've already analyzed "certain" as denoting a context-sensitive function from agents and propositions to degrees of certainty (either epistemic or subjective).

But can we say anything more substantive about how to understand this function?

Certainty and Evidential Probability

Hypothesis: "certain" denotes a probability function

- Epistemic uses of "certain" denote a contextually supplied epistemic probability function, which assigns probability 1 to all the c-relevant $\mathcal{E}$-alternatives.
- Subjective uses of "certain" denote a contextually supplied subjective probability function, which assigns probability 1 to all the c-relevant $\mathcal{S}$-alternatives.

Certainty Account of Evidential Probability

The evidential probability of p (relative to a context c) is p's degree of epistemic certainty (relative to c).

Certainty and Evidential Probability

Certainty Account of Evidential Probability + the Credal Constraint $\Rightarrow$

Fine-Grained Normative Link

Relative to any context, your degree of subjective certainty in p should equal the degree to which p is epistemically certain for you.

Avoids the counterintuitive result that the unconfident examinee should be maximally confident that Elizabeth I died in 1603.

Independent Evidence for the Certainty Account

(25) # It's 99% certain/likely the Mets will win. But it's only 98% likely/certain that they'll win.

Cf. Lassiter [2017]

Outline

Classical Analysis of Epistemic Modals

Knowledge Analysis of Epistemic Modals

- $\ulcorner \Diamond p \urcorner$ is true at a point of evaluation i iff p is compatible with what's known by the relevant folks.
- $\ulcorner \Box p \urcorner$ is true at i iff p is entailed by what's known by the relevant folks.

—Hacking [1967]; Kratzer [1981]; DeRose [1991]; Egan et al [2005]; Stanley [2005]; Stephenson [2007]; Dorr & Hawthorne [2013]

Certainty Analysis of Epistemic Modals

Certainty Analysis of Epistemic Modals

- $\ulcorner \Diamond p \urcorner$ is true at $\langle c, w \rangle$ iff p is compatible with what's epistemically certain at w relative to the standards in c.
- $\ulcorner \Box p \urcorner$is true at $\langle c, w \rangle$ iff p is entailed by what's epistemically certain at w relative to the standards in c.

—Cf. Littlejohn [2011]

In Favor of the Certainty Analysis

Evidence of a close connection between certainty and epistemic modals:

(26) # The butler must have done it. But it's not certain that the butler did it.

(27) # There's no possibility that the cook was involved. But it isn't certain that the cook wasn't involved.

This connection is explained by the Certainty Analysis, but not by the Knowledge Analysis.

In Favor of the Certainty Analysis

Connection persists in embedded contexts:

(28) # Suppose both that there's no possibility that the cook was involved and it's not certain that the cook wasn't involved.

(29) # If the butler must have done it and it's not certain whether he did it, then ...

In Favor of the Certainty Analysis

Independent evidence for the Certainty Analysis comes from the phenomenon of *modal concord*

(30) a. You may possibly have read my little monograph on the subject. ≈

b. You may have read my little monograph on the subject.

—Conan Doyle, *The Hound of the Baskervilles*

In Favor of the Certainty Analysis

Empirical Generalization: Concord readings are only available when both modals are equivalent.

(31) You may possibly have read my monograph. **Concord Available**

(32) ? You must possibly have read my monograph. **No Concord**

(33) ? You may certainly have read my monograph. **No Concord**

In Favor of the Certainty Analysis

Observation: “Must” and “certainly” give rise to modal concord.

(34) You must certainly have read my monograph. **Concord Available**

In Favor of the Certainty Analysis

Examples from the Corpus of Contemporary American English:

(35) You must certainly remember who I am.

(36) Something about her told him that she must certainly be noble.

(37) Vanguard keeps costs low, but people must certainly be making financial services industry salaries.

All these sentences are most naturally given a concord reading.

Epistemic Modals & Evidential Probability

These two applications of certainty in epistemology—evidential probability and epistemic modals—fit naturally together.

- It's certain the butler did it $\equiv$ The butler must have done it. $\Rightarrow$
- It's 95% likely the butler did it $\equiv$ It's 95% certain the butler did it. $\Rightarrow$
- The butler might have done it $\equiv$ It's not certain the butler didn't do it.

Outline

Taking Stock

Recent epistemology has given certainty short shrift.

In this talk, I've tried to mount a rehabilitation campaign. I've:

1. Developed an account of certainty
2. Argued that certainty can be used to analyze both evidence/evidential probability and epistemic modals

Further Applications

Norms of assertion and practical reasoning?

Certainty Norm of Assertion

It is epistemically permissible to assert p iff p is epistemically certain for you, relative to your context. (Cf. Stanley 2008)

Advantage: Explains incoherence of:

(38) # The train is late but it's not certain that the train is late.

Bonus Advantage: Potential to explain the incoherence of:

(39) # The train is late but I don't know whether I know it's late.

—Cf. Sosa [2009]

Further Applications

Certainty Norm of Practical Reasoning

It is epistemically permissible for you to rely on p iff p is epistemically certain for you, relative to your context.

Potential Advantage: Handles some of the counterexamples to the sufficiency direction of the knowledge norm of practical reasoning

- e.g., Brown's surgeon case [2008]; Reed's jellybean case [2010]; Roeber's survey case [2017]

Thanks!