Probabilities, Free Will

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1 Success vs. Control

Consider the following weakening of the T axiom validated by the CA:

○ *Success*: $try(S, \varphi) \wedge \varphi(S) \vDash A_S \varphi$

A simple argument for Success comes from judgments of incoherence:

(1) #Susie might try to hit the bullseye and succeed, but she can't hit the bullseye.

It looks like *can't* appears to entail *won't*.

Success, however, is in tension with the principle that ability requires *control* in some robust sense:

> but not, of course, with some super thin version of that principle

(2) [*Susie wildly throws a dart at a dartboard, trying to hit the bullseye, and, just by luck, hits the bullseye. Before the throw, she asserted:*]

     a. I am able to hit the bullseye.

Many judge that the flukiness of the outcome show that she wasn't *able* to: just doing something doesn't show you *are able* to do it. Rather, ability requires something more: *control* over the action in question.

Everyone agrees that doing something once doesn't show you can do it in *general*. The interesting question is about specific abilities.

> Willer (2021): 'the can of ability is essentially an existential quantifier over a set of available actions, and that an action is available to an agent just in case he or she is deemed to have sufficient understanding of how to achieve the relevant outcome.'

1.1 Kenny again

Why think ability requires control (besides the widespread intuition)?

We can adapt Kenny's argument against K. Suppose Susie shuffles a fair deck of cards and places it face down. Consider:

> Cf. discussion in Boylan 2020.

(3)   a. Susie can draw a red card.
       b. Susie can draw a black card.

According to Kenny 1976—and in general, if ability requires control—both (3-a) and (3-b) are false. But Susie *will* draw a red card or she will draw a black card. So, by Success, it follows that she can draw black or she can draw red.

> Assuming she is trying to draw a red card and trying to draw a black card; say she needs a diamonds and a clubs to win the game.

1.2 Entailment patterns

Santorio gives a roundabout but intriguing argument:

○ ability entails circumstantial possibility, but not v.v.:

$A_s\varphi \vDash \Diamond_c\varphi(S)$ but $\Diamond_c\varphi(S) \nvDash A_s\varphi$.

(4) a. Susie is able to hit a bullseye
         → It can be that Susie hits a bullseye.
    b. It can be that Susie hits a bullseye
         ↛ Susie is able to hit the bullseye.

Some cases where it seems plausible this fails:

– the time traveler is able to kill his grandfather, but it's impossible that he will

My take on a case from Lewis 1976. If he tried, he would. But, necessarily, he won't try.

– Kieran is able to run a marathon, but it's impossible that he will

Setiya 2023

○ inability entails circumstantial impossibility, but not v.v.:

$\neg A_s\varphi \vDash \neg\Diamond_c\varphi(S)$ but $\neg\Diamond_c\varphi(S) \nvDash \neg A_s\varphi$

(5) a. Susie is unable to hit a bullseye
         → It cannot be that Susie hits a bullseye.
    b. The statue cannot fall from the bridge
         ↛ The statue is unable to fall from the bridge.

– Are we sure the 'cannot' in (5-a) is circumstantial, rather than epistemic? 'I'm unable to go to dinner' entails (I think) that I won't but not that it's impossible for me to.

Santorio concludes we have $A_S\varphi \vDash \Diamond_c\varphi$ and $\neg A_S\varphi \vDash \neg\Diamond_c\varphi$; to avoid positing equivalence between $A_s\varphi$ and $\Diamond_c\varphi$, we must have some gappiness. He glosses this as *dependence*:

> I suggest that 'Ava is able to hit the target on this throw', but not 'It can happen that Ava hits the target on this throw', requires that whether Ava hits the target depends on Ava, as opposed to luck or external circumstances of various kinds…[i.e.,] some relevant facts about Ava…determine whether or not she hits the target

Specifically, this makes the first sentence undefined when Ava's hitting the bullseye is merely lucky. Why dependence?

> *Ben is a mediocre dart thrower who's about to throw a dart. In ordinary circumstances, there would be a high chance that he would miss. But Ben's magician friend Camille wants Ben's dart to hit the target. So, as soon as the dart leaves Ben's hands, Camille will cast a spell on the dart, leading it to the target. Notice first that, in this scenario, the circumstantial necessity claim in (6) is true.*

(6) Ben cannot miss the target on this throw.

Yet there is at least one salient reading on which (7) doesn't sound true:

(7) Ben is able to hit the target on this throw.

So $\Box_c\varphi(S) \nvDash A_s\varphi$.

1.3   Incorporating control

There are various ways to incorporate control into an analysis of A_s:

- via truth-conditions: $A_s\varphi$ says that it's possible that S does φ with control (e.g. Brown 1988; Fusco 2020); or that S's doing φ happens *enough of the time* that she tries (e.g. Willer 2021)

- as a presupposition: $A_s\varphi$ asserts $\Diamond_c\varphi(S)$, and presupposes that φ is in S's control.

Roughly Boylan 2020; Santorio 2022.

A nice feature of the presuppositional approach is that it makes sense of the data motivating Success, and hence vitiates some of the motivation for that principle. For (8) is never assertable on his account:

(8)   Susie can't hit a bullseye but she might.

since 'Susie can't hit a bullseye' entails that Susie doesn't hit a bullseye: when Susie lacks control but might hit a bullseye, the ability statement is undefined, not false.

2   Probability judgments

This leaves a deadlock between control and Success. I've argued that epistemic modal and probability judgments tell in favor of Success:

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- Susie is haphazardly throwing darts. Every thousand throws, she gets a bullseye, just by luck. Just before 3 pm, she is standing before the dartboard.

It doesn't matter exactly what sense of probability we have in mind in these cases. I will move freely between talk of chance and probability, and between talking about the probability of sentences and of the corresponding propositions.

  (9)   What's the chance that Susie will be able to hit a bullseye?

  (10)   Might Susie be able to hit a bullseye?

- Ginger is standing on the basketball court getting ready to attempt a free throw. Conditional on taking a shot, she has a 10% chance of making a basket. What's the chance of (11)? Might it be true?

  (11)   Ginger can make this shot.

- Benjy doesn't like going to the vet. Based on past experience, I have about a 20% rate of success at getting him into his carrier. Given that, what is the chance of (12)?

  (12)   I can get Benjy into his carrier for this vet visit.

  (13)   I might be able to get Benjy into his carrier.

2.1 Targeting the complement?

Might a simple error theory explain away these judgments? Viz., when asked about the probability of $A_s\varphi$, the intuitions we access are simply about whether $\varphi(S)$ is true?

To test this, we can explore cases where the probability of $\varphi(S)$ is clearly different from the probability of $A_s\varphi$. Suppose the coach is considering which of five players to choose to attempt a free throw after a technical foul. She asks the assistant coach:

(14)   What's the chance that Ginger can make this free throw?

Given that Ginger makes 10% of free throws that she attempts, the answer is intuitively 10%. But the chance that Ginger *makes* the shot is much lower, since she might not be substituted in.

There are tricky issues about actuality entailments here. But I think we can get around them by looking at other languages.

> This can be spelled out in different ways. von Fintel and Gillies (2008) argue that in general, subjects sometimes focus on the complement of a modal claim rather than the modal claim in assessing what was said. More locally, Bhatt (1999) observes that in some cases an ability claim just sounds equivalent to its complement (it has an *actuality entailment*).

3 Against control

In the absence of an error theory, I think probability judgments show that the control intuition is wrong.

What's the chance that Susie will hit the bullseye at 3 pm *in a controlled way*? Zero. If anyone ever lacked control over an action, it's Susie, vis-à-vis hitting a bullseye.

But the chance Susie will *be able to* hit the bullseye at 3 pm is not zero, but $\frac{1}{1000}$.

If ability entailed control, this would be impossible, since if φ entails ψ and ψ has no probability, then φ can have no probability.

Similar points apply to the other cases above. Make an action as chancy and out of control as you like. If there's some chance S will do it, then there's some chance she will be able to do it, contra control.

This also speaks against incorporating control as a presupposition.

> At least I think so. This is all compatible with Susie having control in some thin sense over the outcome, but that isn't what's at stake in this debate.

> Either you will take the presupposition into account and think Susie has zero probability of being able to hit the bullseye, or you will ignore it and think she has probability one of hitting the bullseye.

4 Pro Success

At the same time, probability judgments support Success. The key observation in all of our cases is:

○ $Pr(A_s\varphi) \geq Pr(try(S, \varphi) \wedge \varphi(S))$.

For instance, the chance that Susie will be able to hit the bullseye is at least as great as the chance she will. The chance Ginger can make the shot is at least as great as the chance that she will.

4.1 Against Kenny?

Recall that the Kenny argument for control rests on the claim that both (15-a) and (15-b) are false:

(15) a. Susie can draw a red card from the deck.
      b. Susie can draw a black card from the deck.

What seems right is that both are unassertable; but unassertability could be due to ignorance.

Now consider their probabilities. What's the chance Susie can draw a red card from the deck? I think $\frac{1}{2}$. Same for black.

So probability judgments suggest that what makes Kenny's pair unassertable is not that both are false but rather that neither has sufficient probability to be assertable.

5 The conditional analysis

Probability judgments also support some form of conditional analysis over existential analyses. To see this, compare the probabilities of:

(16) a. Susie can hit a bullseye.
      b. If Susie tries to hit a bullseye, she'll succeed.
      c. There's some possibility that Susie hits a bullseye.

The probability of (16-a) and (16-b) are intuitively equivalent—namely, .1%. By contrast, the probability of (16-c) is much higher than that: we're *sure* there's *some* possibility that Susie hits a bullseye.

Compare:

(17) a. Ginger can make this free throw.
      b. If Ginger tries, she will make this free throw.
      c. There's some possibility that Ginger will make this free throw.

More generally, the probability of $A_s\varphi$

- generally matches the probability of 'if $try(S, \varphi)$, then $\varphi(S)$'

- generally matches the probability of $\varphi(S)$, conditional on $try(S, \varphi)$

- generally does *not* match the probability of $\Diamond\varphi(S)$

This suggests:

> *The Agentive Thesis*: In general, $Pr(A_s\varphi) = Pr(\varphi(S) \mid try(S, \varphi))$

A standard observation in the literature on conditionals is that the probability of 'if φ, ψ' is generally equal to the probability of ψ conditional on φ. So an account on which the meaning of $A_s\varphi$ is 'if $try(S, \varphi)$

then $\varphi(S)'$, together with a general story about the probabilities of conditionals, has a good shot at making sense of these judgments.

6   Probabilities and the ACA

Of course, the cases that apparently refute the CA also appear to refute The Agentive Thesis.

Plus, the weakening of T in Success doesn't account for incoherence data in the neighborhood of those that motivate Success, like (18-a):

(18)   [*Susie enters an elevator; unbeknownst to her, the buttons for the second and third floor have their wires crossed.*]

   a.   #Susie might go to the second floor, but she can't go to the second floor.

The problem is that, per the CA, Susie can't go to the second floor, since if she tries to go to the second floor, she'll go to the third.

This is the kind of case that the ACA deals with well.

More generally, modulo issues about agents acting without trying, the ACA validates not just Success but the stronger principle that $\varphi(S)$ entails $A_S\varphi$, dealing with cases like this.

> Assuming whatever is actually tried is available.

What about probabilities? Insofar as the ACA coincides with the CA as a default matter, probability judgments seem to support the ACA.

They might also raise new problems for it, though. First:

> Building on similar cases suggested to me by Ben Holguín and an anonymous reviewer.

(19)   Ann is handed two fair decks of cards. What is the chance that she can draw a clubs from one of the decks without looking?

Intuitively, there are two judgments available:

◦ $\frac{1}{4}$ (the chance that she draws clubs, conditional on trying to);

◦ 1 (the chance that she will draw a clubs, conditional on trying to draw c, where c is any clubs card in the deck).

The ACA predicts both judgments, depending how the context chunks up the practically available actions. But the ACA also predicts other judgments, e.g. when the context divides up the available actions as:

$\{draw\ a\ card\ from\ Deck\ 1, draw\ a\ card\ from\ Deck\ 2, don't\ draw\ a\ card\ from\ either\ deck\}$

it predicts that the chance that Ann will be able to draw a clubs is $\frac{7}{16}$, which does not seem to be available.

It is worth comparing (20):

(20)   One of the decks is such that, if Ann tries to draw a card from it, she'll draw a clubs from it.

Many people say this has chance $\frac{1}{4}$. So the puzzle may be about intu- itions about probabilities of quantified conditionals, not the ACA.

(21)   [*There are ten buttons, numbered one through ten, exactly one of which (say, seven) will activate auto-pilot. Jim doesn't know which button turns on auto-pilot.*]

   a.   What is the chance that Jim can now engage auto-pilot?

The ACA can predict .1 and 1. But it apparently predicts other read- ings, too, distinguishable by their probabilities:

- Suppose the available actions are {*press one or two, press three or four, press five or six, press seven or eight, press nine or ten, don't press a button*}. The chance that one of *these* actions is such that, if Jim tries to do it, he'll engage the auto-pilot, is plausibly .5.

- or if we have {*press an odd button, press an even button, don't press a button*} we get a chance judgment of .2.

Etc. Compare again the overt quantified conditional:

(22)   There is an action such that if Jim tries to do it, he'll engage the autopilot.

I can only get readings of (22) where the chance is .1 or 1, not the intermediate ones. If so that suggests the fault is not the ACA but the way we quantify over actions: we do so in either a maximally fine- grained or maximally coarse-grained way.

7   Non-agents, again

Probability judgments may help resolve a puzzle about cases where we apparently ascribe abilities to non-agents:

(23)   This elevator is able to carry three thousand pounds.

(24)   This black hole is able to absorb that galaxy.

This is an objection to any form of conditional analysis, since e.g. (24) doesn't mean that the black hole will absorb the galaxy *if it tries*. The deeper question is whether we have any truly *agential* modality at all, or everything is in some sense about (im)possibility.

   Probability judgments suggest that these cases are actually differ- ent: (23) is an ability ascription, where the trying is done by a covert, generic agent, while (24) is a circumstantial modal.

   Suppose that conditional on loading the elevator with three thou- sand pounds of cargo, there is a 30% chance that the cord will snap, and a 70% chance that the elevator will work as normal. In that case,

the probability of (23) is intuitively, 70%. That is, credences again seem to track conditional probabilities. That suggests an analysis of sentences like (23) along the lines of a conditional analysis, but with a covert generic agent.

By contrast, in the case of (24), appealing to a covert generic agent obviously won't help. But the case also seems totally different from all the cases of ability ascriptions we've looked at so, whose probabilities always matched a salient *conditional* probability judgment. But this doesn't seem to be true in this case.

What *should* your credence in (24) be? It seems like it should just track your credence that there is *some* possibility that the black hole absorbs the galaxy.

8 Freedom and ability

Let us say that determinism is true at our world. Familiar arguments purport to show that, if this is the case, then no one has the ability to do anything, except perhaps for what she actually does... But if (CA) is true, then agents would have the ability to perform various actions that they do not actually perform. For it is plausible that the conditionals in terms of which (CA) analyzes ability would still be true in a deterministic world. But then, since it makes false predictions about such a world, which for all we know may be our own, (CA) is false.   SEP, *Ability*

Dialectically bizarre!

Soft determinism is the doctrine that sometimes one freely does what one is predetermined to do; and that in such a case one is able to act otherwise though past history and the laws of nature determine that one will not act otherwise. Compatibilism is the doctrine that soft determinism may be true.

Lewis, *Are we free to break the laws?*

It does seem like if something along the lines of the CA is right, then compatibilism is true. Assume determinism; could one have done otherwise? Well that just concerns the truth of a counterfactual conditional — but who ever thought that determinism implies that all counterfactuals are false?

Set aside issues about *freedom* which seem heady and obscure.

That is, suppose there is some history H and laws L such that $H\&L$ entails φ. Could it still be true that $A_S\neg\varphi$?

Could it still be true that, if S had tried to $\neg\varphi$, she would have succeeded?

Why not? Surely there is no *general* reason to think not, any more than there is a general reason to think that when $H\&L$ entails φ, $\neg\varphi > \psi$ could never be true. The point is that conditionals take us to *different possible worlds*, where some actual history or law changes.

This is not to say there's no residual puzzle. Supposing determinism is true and φ happens, then any world where $\neg\varphi$ is true is one where $H\&L$ is false.

Does it follow that you could have (broken a law or changed the past)? Not de dicto, of course: the counterfactual possibility is not one where a law (there) or the past (there) is changed.

What about the actual laws/past?

- yes, we could have violated an actual law, but not *caused* it to be violated

- no; the past would have been different. But you didn't *change* the past.

  Dorr, *Against counterfactual miracles*.

- It depends on the context: Teitel and Holguín.

References

Bhatt, R. (1999). Ability modals and their actuality entailments. In Shahin, K., Blake, S., and Kim, E.-S., editors, *The West Coast Conference on Formal Linguistics (WCCFL)*, volume 17, pages 74–87.

Boylan, D. (2020). Does success entail ability? *Noûs*.

Brown, M. A. (1988). On the logic of ability. *Journal of Philosophical Logic*, 17:1–26.

von Fintel, K. and Gillies, A. (2008). CIA leaks. *Philosophical Review*, 117(1):77–98.

Fusco, M. (2020). Agential free choice. *Journal of Philosophical Logic*, 50:57–87.

Kenny, A. (1976). Human abilities and dynamic modalities. In Manninen and Tuomela, editors, *Essays on Explanation and Understanding*, pages 209–232. D. Reidel.

Lewis, D. (1976). The paradoxes of time travel. *American Philosophical Quarterly*, (145-152).

Mandelkern, M. (2024). Chance, ability, and control. *Philosophy and Phenomenological Research*.

Santorio, P. (2022). Ability modals as causal modals. In Degano, M., Roberts, T., Sbardolini, G., and Schouwstra, M., editors, *Proceedings of the 23rd Amsterdam Colloquium*, pages 267–274.

Setiya, K. (2023). Freedom and the will. Manuscript, MIT.

Willer, M. (2021). Two puzzles about ability *can*. *Linguistics and Philosophy*, 44:551–586.