Ability vs. control

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Matt Mandelkern

1 Non-agents again

The ACA doesn't have any extra resources for dealing with non-agents. Two potential strategies:

- invoke generic or implicit agents, and dismiss other cases as involving circumstantial modals

- get rid of 'trying' from the conditional antecedent.

  There's variation in the literature, but most of the alternatives (*intends, wants, has beliefs and desires that rationalize*, etc.) are agentive.

  Cross proposed that the antecedent should concern *test conditions*. Insofar as that's strictly more general, we won't find arguments against it and for the more restricted thing. But there's a question of whether the added generality is worth the loss in predictive power.

Cf. Boylan 2020

2 Subjective vs. objective readings

An intriguing feature of the ACA is that it seems able to capture (and predicts the existence of) two readings of ability ascriptions:

(1) [*Lucie is faced with an array of 100 buttons. One of them will disarm the bomb; the other 99 will detonate it. She does not know which one disarms the bomb (in fact, it's 77).*]

   a. Lucie is able to disarm the bomb.

Intuitively, there is a false, or at least very unlikely, reading of this: Lucie has absolutely no idea which button is the right one to push.

Intuitively there's also a true reading: Lucie obviously can push button 77, but pushing button 77 *just is* disarming the bomb.

It's hard to see how to account for these two intuitions on an existential view.

Though see Schwarz, 'Ability and possibility', for an interesting attempt. He calls these *opaque* and *transparent*, which is probably better terminology.

By contrast, on the ACA, you can get the two readings by individuating the available actions differently:

- as {*push 1, push 2, push 3, . . . push 100, don't push*}. One of these is certainly such that, if Lucie tries to do it, she disarms the bomb.

- as *{disarm the bomb, don't disarm the bomb}*. If Lucie tries to disarm the bomb, there's only a small chance she'll succeed.

Could the true reading here be circumstantial? Perhaps — but there is obviously a true agentive reading of 'Lucie can push button 77', and it seems that's what leads us to accept 'Lucie can disarm the bomb'.

3 Logic

3.1 The CA

The logic of the CA depends on the logic of the underlying conditional. Given Stalnaker's conditional, there is a natural explanation of the failures of K. While can infer from (2-a) to (2-b):

(2) a. $try(S, \varphi \vee \psi) > (\varphi(S) \vee \psi(S))$
  b. $(try(S, \varphi \vee \psi) > \varphi(S)) \vee (try(S, \varphi \vee \psi) > \psi(S)))$.

We cannot then conclude:

(3) $(try(S, \varphi) > \varphi(S)) \vee (try(S, \psi) > \psi(S))$.

Application to cases...

We *do* still have the inference from $try(S, \varphi) \wedge \varphi(S)$ to $A_S\varphi$, however...

3.2 The ACA

Somewhat surprisingly, on the ACA, A_S can be reformulated as $\Diamond$:

$$[\![A_S\varphi]\!]^{c,w} = 1 \textit{ iff}$$

$$\exists\psi \in \mathcal{A}_{S,c,w} : [\![try(S,\psi) > \varphi(S)]\!]^{c,w} = 1 \textit{ iff}$$

$$\exists\psi \in \mathcal{A}_{S,c,w} : f(try(S,\psi)) \in [\![\varphi(S)]\!]^{c} \textit{ iff}$$

$$\exists w' \in R(w) : w' \in [\![\varphi(S)]\!]^{c},$$

$$\textit{where } R(w) = \{u : \exists\psi \in \mathcal{A}_{S,c} : u = f(try(S,\psi), w)\}$$

So the logic of A_S on the ACA is a normal modal logic.

What about Kenny's arguments against K? Two responses:

- Kenny's arguments are good for generic, but not specific, abilities
- indeterminacy: $A_S(\varphi \vee \psi)$ entails $A_S\varphi \vee A_S\psi$, but it need not be the case that either $A_S\varphi$ or $A_S\psi$ is determinately true even if their disjunction is.

Do we also have T? Almost... whenever $\varphi(S)$ is true, and S does φ by trying to do ψ, and $\psi \in \mathcal{A}_{S,c,w}$, then $A_S\varphi$ is true by strong centering. But what if S does something without trying *anything*? Suppose S is comatose, in the way that prevents even trying. She is breathing. Is she able to breathe? Not according to the ACA.

Note, however, that this doesn't really help with the Kenny examples and instead seems to be a useless bug in the system.

A final methodological question: if the ACA is a version of A as $\Diamond$, is there anything to choose between here?

4 Success vs. Control

Consider the following weakening of the T axiom:

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

A simple direct argument for Success comes from judgments of incoherence: it's very strange to assert that S *might* try to do φ and succeed, while denying that S *can* do φ, as in (4).

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

In other words, *can't* appears to entail *won't*.

Success, however, is in tension with another principle which is widely endorsed: that ability requires *control*.

(5) [*Susie wildly throws a dart at a dartboard, trying to hit the bullseye, and, just by luck, hits the bullseye.*]

a. ?Susie was able to hit the bullseye.

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

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.'.

Of course, everyone agrees that doing something once doesn't show you have a *general* ability to do it. So the interesting question is about specific abilities.

4.1 Kenny again

Why think ability requires control (besides the brute intuition, reported by many)?

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

Cf. recent discussion in Boylan 2020.

(6) 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 (6-a) and (6-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.

4.2 Entailment patterns

Santorio gives a roundabout but intriguing argument:

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

(7) a. Susie is able to hit a bullseye
$\rightarrow$ It can be that Susie hits a bullseye.
b. It can be that Susie hits a bullseye
$\not\rightarrow$ Susie is able to hit the bullseye.

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

(8) a. Susie is unable to hit a bullseye
$\rightarrow$ It cannot be that Susie hits a bullseye.
b. The status cannot fall from the bridge
$\not\rightarrow$ The statue is unable to fall from the bridge.

Are we sure the 'cannot' in (8-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, glossed 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. This dependence claim is understood as a sufficiency claim: some relevant facts about of Ava (plus, as we'll see, some background facts) determine whether or not she hits the target

Specifically, this is supposed to make the first sentence undefined in a case where 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 (9) is true.*
>
> (9) Ben cannot miss the target on this throw.
>
> *Yet there is at least one salient reading on which (10) doesn't sound true:*
>
> (10) Ben is able to hit the target on this throw.

So he thinks circumstantial necessity doesn't entail ability.

Positing that ability requires control yields a natural explanation of the apparent falsity of (10); cf. statue.

4.3 Incorporating control

There are various ways to incorporate control into an analysis:

- 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 $\Diamond\varphi(S)$, and presupposes that φ is in S's control.

  Santorio: either, in all worlds in the "dependence domain", $\varphi(S)$; or, in all those worlds, $\neg\varphi(S)$. Basically, φ-ing is up to S.

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 (11) is never assertable on his account:

(11) 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.

5 Probability judgments

This leaves a deadlock between control and success. In Mandelkern 2024, I argued that probability judgments help decide the issue:

- 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.

  (12) What's the chance that Susie will be able to hit a bullseye at 3 pm?

  (13) Might Susie be able to hit a bullseye at 3 pm?

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.

- 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 (14)?

  (14) Ginger can make this shot.

  (15) Ginger might be able to 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 (16)?

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

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

5.1 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:

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*).

(18) 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.

6 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.

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.

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.

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.

7 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.

More generally, it's hard to imagine a case where it would be coherent to think that there's an *m*-chance that S will try to φ and succeed, but less than an *m* chance that S will be *able* to φ.

This supports Success since an inference is valid iff it always preserves probability.

In a classical setting

7.1 Against Kenny

Recall that the Kenny argument for control rests on the claim that both (19-a) and (19-b) are false:

(19) 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 can be explained in various ways.

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.

8 The conditional analysis

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

(20) 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 (20-a) and (20-b) are intuitively equivalent—namely, .1%. By contrast, the probability of (20-c) is much higher than that: we're *sure* there's *some* possibility that Susie hits a bullseye.

Compare:

(21) 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 $\Diamond\varphi(S)$

Call this *The Agentive Thesis*

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.

9 Probabilities and the ACA

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

More locally, the weakening of T in Success doesn't account for incoherence data in the neighborhood of those that motivate Success, like (22-a):

(22) [*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 for the CA is that 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.

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.

(23) 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 can predict both judgments, depending on how the context chunks up the practically available actions.

But the ACA also predicts another judgment. 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 slightly higher than $\frac{1}{4}$: it is the chance that either (i) if she tries to draw a card from Deck 1, she draws a club; or (ii) if she tries to draw a card from Deck 2, she draws a club; or (iii) if she tries to not draw a card, she draws a club, i.e. $\frac{7}{16}$, which does not seem to be available.

It is worth noting, however, that this is *also* the intuition people seem to have about the chance of (24):

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

So the puzzle may be about probabilities of quantified conditionals, not the ACA. A second, perhaps related puzzle:

Due to an anonymous reviewer.

(25) [*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 readings, 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. This is a serious challenge. Compare again the overt quantified conditional:

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

I can only get readings of (26) where the chance is .1 or 1, not the intermediate ones. If so that suggests, again, 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.

Of course, this is terribly vague.

10 Non-agents, again

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

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

from Irene Heim, attributed to Maria Bittner

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

This is an objection to any form of conditional analysis, since e.g. (28) 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 different: (27) is an ability ascription, where the trying is done by a covert, generic agent, while (28) is a circumstantial modal.

Suppose that conditional on loading the elevator with three thousand 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 (27) is intuitively, 70%. That is, credences again seem to track conditional probabilities. That suggests an analysis of sentences like (27) along the lines of a conditional analysis, but with a covert generic agent.

By contrast, in the case of (28), 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 (28) be? It seems like it should just track your credence that there is *some* possibility that the black hole absorbs the galaxy.

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