Chance, Ability, and Control*

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Abstract

A compelling, and popular, thought is that *ability entails control*: S's being able to φ entails that φ be, in some sense, in S's control. This intuition is inconsistent with a different thought that many have found compelling: that S's actually φ-ing entails that S is able to φ. In this paper, I introduce a new form of evidence to help adjudicate between these two theses: probability judgments about ability ascriptions. I argue that these judgments provide evidence in favor of the intuition that success entails ability, and against the intuition that ability requires control. Moreover, I argue that these judgments support one particular analysis which vindicates the success intuition, namely, the analysis of ability in terms of conditionals.

1 Introduction

What does it take to be able to do something—say, wash the dishes before bed, read a paper, or hit a bullseye? In this paper I will focus on one particular controversy in the theory of ability: namely, whether ability requires control. On the one hand, it is natural to think that S is able to φ only if φ is under S's control: that is, ability entails *control*. On the other hand, it is natural to think that S actually φ-ing shows that S is able to φ: that is, *success* entails ability.

But these two intuitions conflict. If ability requires control, then it's possible for S to φ without being able φ—namely, by φ-ing in an out-of-control, fluky way. Conversely, if success entails ability, then flukily φ-ing shows that S is able to φ, whether or not φ is in her control.

The literature seems deadlocked on this issue: intuitions in key cases are disputed, and prominent analyses have come down on either side of the debate. In this paper, I aim to resolve

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this controversy by introducing a new form of evidence to the debate: judgments about the probabilities of ability ascriptions. I argue that these provide an important source of evidence about the meaning of ability ascriptions. In particular, they provide evidence in favor of the success intuition, and against the control intuition. Hence they support analyses that entail the success intuition. More specifically, I argue that they support an analysis of ability in terms of *conditionals*, in the tradition of Hume 1748.

I set up the debate by first introducing approaches which validate the success inference but not the control inference (§2), and then approaches which embrace control rather than success (§3). In §4 I introduce my key data: probability judgments about ability ascriptions. I explain how these data favor success and tell against control (§5), and finally argue that, in particular, they favor a form of conditional analysis of ability (§6).

2 Success

First, some preliminaries. My topic is *agentive modals*: words like 'able' and 'can' in English, on a reading where they are used to talk about abilities or their lack. In some cases it is unclear whether they are getting such a reading rather than a circumstantial reading (a topic I'll return to in §6.4); for the most part I will focus on what I think everyone will take to be paradigmatic ability readings. When I talk about 'able' without further specification, what I mean is 'able' *on its agentive reading*. I move freely between 'able' and 'can', assuming that on their agentive readings, they mean the same thing. I assume agentive modals denote a relation between an individual and an action (which, for simplicity, I'll model simply as a property of individuals); I write $A_s\varphi$ for ⌜S is able to φ⌝ on its agentive reading, and $\varphi(S)$ for ⌜S φ's⌝. I will be sloppy about use and mention (so I will use φ both as a schematic variable over predicates in our target fragment and as a metalanguage variable over actions).

With this in hand, I'll begin by introducing two popular theories of ability, and then briefly motivate the success inference, which they both embrace.

2.1 The existential analysis

The existential analysis of agentive modals says that $A_s\varphi$ is an existential quantifier over accessible worlds; analyses along these lines were proposed in Hilpinen 1969; Lewis 1976; Kratzer 1977, 1981. There are differences in implementation which need not concern us here;[1] the basic idea is that 'able' quantifies existentially over possible worlds that hold fixed the (contextually salient) intrinsic features and extrinsic circumstances of the agent in question (see Vetter 2013 for a helpful characterization of the view). More formally:

[1] Most prominently, Kratzer's treatment involves two contextual parameters, a modal base and ordering source, rather than one; but for our purposes, there is no downside to compressing those parameters into a single accessibility relation.

Existential analysis: $[\![A_s\varphi]\!]^{c,w} = 1$ iff $\exists w' : wR_cw' \wedge [\![\varphi(S)]\!]^{c,w'} = 1$

$[\![\cdot]\!]^{c,w}$ is the interpretation function which takes a sentence to its truth-value at context c and world w. R_c is the context's binary accessibility relation on worlds, which, again, holds fixed salient facts about the agent's circumstance and her intrinsic features. So, for instance, a sentence like (1) is predicted to be true on this view just in case Flo's circumstances and intrinsic features are compatible with her flying:

(1) Flo is able to fly.

If Flo is a penguin, (1) thus comes out false. If Flo is a swallow, and otherwise unimpeded from flying, then (1) comes out true.

2.2 The conditional analysis

A popular alternative theory analyzes ability in terms of *conditionals*. To see the motivation for a theory like this, consider this case from Mandelkern et al. 2017. Jo is playing darts. Jo's young daughter Susie exclaims:

(2) I'm able to hit the bullseye on this throw.

Now suppose that Susie is an ordinary five-year-old child: she is relatively weak and uncoordinated, and it is extremely unlikely that she'll hit the bullseye if she tries. But it's not *impossible*: hitting the bullseye is still *consistent* with her intrinsic features and local circumstances, for her to hit a bullseye. Still, most people won't readily assert or assent to (2). Intuitions about the precise status of (2) vary, but no one seems to think that (2) is clearly true. Instead, people tend to think that (2) is indeterminate, or false, or unlikely, or perhaps unassertable for yet some other reason. One of the goals of this paper is to clarify the precise status of sentences like (2). But the present point is that all of these judgments are, on the face of it, inconsistent with the existential theory, which predicts that (2) is clearly, determinately, certainly true, since it is clearly, determinately, certainly *compatible* with Susie's intrinsic features, and the present circumstances, that Susie hit the bullseye on this throw.

Cases like this motivate a conditional analysis of ability. The conditional analysis is due to Hume 1748 and has been an influential contender since (e.g. Moore 1912; Lehrer 1976; Cross 1986; Thomason 2005). On the simplest form of conditional analysis (to be revisited in §6), $A_s\varphi$ says that if S tries to φ, then S does φ. That is, where $try(S, \varphi)$ is shorthand for ⌜S tries to φ⌝ and $>$ is the conditional operator ⌜If... then...⌝:

Conditional analysis: $[\![A_s\varphi]\!]^{c,w} = 1$ iff $[\![try(S, \varphi) > \varphi(S)]\!]^{c,w} = 1$

This account seems to do better than the existential analysis in cases like that of Susie. According to the conditional analysis, 'I'm able to hit the bullseye on this throw' is equivalent to 'If I try to hit the bullseye, I'll succeed'. This seems intuitively correct. Different theories of the conditional have different verdicts on the status of this conditional, but no one predicts that it is certainly true, matching intuitions about the ability claim.

The conditional analysis in its simplest form has serious problems (see §6.2). But for now I want to step back from the debate between the existential and conditional analyses (I'll return to it in §6.1) and examine an inference that both the existential and conditional analyses validate: success.

2.3 The Success inference

The intuition behind success is that actually *doing* something entails that you are *able* to do it. More carefully, I'll focus on the inference that says if someone tries to do some action and succeeds, then they are able to do that thing:[2]

Success: $try(S, \varphi) \wedge \varphi(S) \vDash A_s\varphi$

Success is validated by both the existential and conditional analyses given some standard auxiliary assumptions. Success follows from the existential analysis given the assumption that every world can access itself under the relevant accessibility relation. That assumption follows from the standard gloss on the existential analysis given above: accessibility holds fixed *facts* about the agent's intrinsic properties and local circumstances, and so every world will be able to access itself. Thus if S actually does φ, then there is an accessible world where she does φ, namely, actuality, and so $A_s\varphi$ is true.

Success also follows from the conditional analysis, given the logical principle *And-to-If* which says that a conditional with a true antecedent and a true consequent is true (that is, $\rho \wedge \chi \vDash \rho > \chi$). Despite substantial controversy about conditionals, *And-to-If* is widely accepted. Given that S tries to do φ and succeeds, it follows by *And-to-If* that S does φ if she tries, and hence, on the conditional analysis, that S is able to do φ.

A simple argument in favor of 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 (3).

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

This is naturally explained by Success, since as long as you leave it open that Susie will try to hit the bullseye and succeed, it follows by Success that you leave it open that she *can* hit

[2] For simplicity, I will ignore issues about tense in this paper.

the bullseye. (See §6.2 for some data in the same neighborhood that are not accounted for by Success.)

For connoisseurs, let me note a dialectical subtlety: the name 'Success' is sometimes used for a strictly stronger principle, which I'll call *Strong Success*, which says that simply φ-ing entails that you are able to φ, whether or not you try to φ:

Strong Success: $\varphi(S) \vDash A_s\varphi$

The negative arguments I will consider target both Success and Strong Success; and the positive argument I will give for Success also favors Strong Success. So very little turns on which principle we are discussing. But, at least initially, I want to focus on Success because the simplest form of the conditional analysis only validates Success, not Strong Success, and I want to emphasize this point of controversy between the existential and conditional analyses, on the one side, and control-based analyses on the other. I'll return to this issue in §6.2, where I'll endorse a revision of the conditional analysis that validates both Success and Strong Success.[3]

3 Control

Despite this striking argument in favor of Success, many doubt its validity. The worry stems from the intuition that being able to φ requires having φ somehow *under your control*. But this conflicts with Success, which entails that if you try to φ and succeed, then you are able to φ, even if φ-ing was completely out of your control, a matter of sheer luck.

Concretely, return to Susie. She will wildly throw a dart at a dartboard, trying to hit the bullseye. Suppose that, improbably, she hits the bullseye, just by luck, a random fluke. In that case, according to Success, she will be *able* to hit the bullseye, since she will have tried to hit the bullseye and succeeded. But many have thought that this cannot be right. To be able to hit the bullseye, you have to do something more than just flukily hit it: the action of hitting the bullseye must somehow be *in your control*. And so Success is not valid.

The intuition that ability requires control, and thus that Success is invalid, is widespread.[4] Boylan (2020) writes that 'control is central to ability... the claim that I can surf that wave is strong—it says that surfing that wave is within my control'. Mandelkern et al. (2017) claim that 'ability ascriptions [are] a kind of *hypothetical guarantee*. When someone says 'John can go swimming this evening', she is informing her interlocutors that going swimming this evening is, in a certain sense, within John's control'. Fusco (2020) argues that 'accidental, or *fluky*,

[3] As Ginger Schultheis has pointed out to me, there are cases where ability ascriptions just sound weird. Sue died; does it follow that she was able to die? This follows from Strong Success; it's not obviously false, but it surely an odd thing to say. Plausibly, 'able' selects for *actions* as its complement, and some predicates with the right syntactic structure won't count as actions for these purposes. If you're worried about this issue, then we can focus on a restricted version of Success: anytime φ satisfies the selectional constraints of 'able', whatever they amount to, $A_s\varphi$ follows from $try(S, \varphi) \wedge \varphi(S)$. See Loets 2023 for related discussion.

[4] See Kikkert 2022 for extensive discussion of the relevant kind of control.

success is insufficient for ascriptions of ability'. Loets and Zakkou (2022) identify the claim that ability requires control as being at the root of a wide range of philosophical views about ability and judgments.[5]

A dialectical subtlety is worth noting. It is standard to distinguish between *general* ability ascriptions, which ascribe the ability to do a *type* of action, versus *specific* ability ascriptions, which ascribe the ability to do a *specific* action, located in a particular place and time. So, for instance, we might accept that Susie was able to hit a bullseye at 3 pm today—she had the specific ability to *hit the bullseye at 3 pm*—while denying that she is *generally* able to *hit bullseyes*. Conversely, someone might generally be able to hit bullseyes, while being unable to hit a bullseye at 3 pm today (because he's drunk). Everyone, I think, will agree that Success is false for general ability ascriptions: just doing something once obviously doesn't show that you can do it *in general*. So the interesting debate between success and control intuitions concerns specific ability ascriptions, and I will focus on these throughout (I will always have specific abilities in mind when I talk about ability unless otherwise noted, though for brevity, I won't always explicitly index the action to a time and place).

To give a better sense of the control intuition, I'll give a brief informal summary of some recent proposals which aim to validate something like the control intuition, and hence invalidate Success. First, we can encode control by stacking modal operators. This is the path taken by Fusco (2020). Following the tradition of Brown 1988; Horty and Belnap 1995, Fusco treats ability ascriptions as complexes of existential and necessity operators: $A_s\varphi$ means that it is historically possible that S's powers *necessitate* $\varphi(S)$. It is natural to think of *S's powers necessitating* $\varphi(S)$ as one gloss on what it means for S to have φ in her control. Then we can gloss Fusco's view this way: $A_s\varphi$ is true just in case there is a historical possibility where S does φ *in a controlled way*. This rules out ability in Susie's case: although it is historically possible that she hit a bullseye, it's not historically possible that she do so in a controlled way.

A second approach encodes control via a threshold. For instance, Willer (2021) suggests that for S to be able to φ is to have 'a good chance at succeeding in performing the relevant action, should he or she try to do it' (cf. Jaster 2020). Once again, this kind of threshold can be seen as a way of cashing out the control intuition: $A_s\varphi$ is true only if φ is in the agent's control to a sufficient degree, in the sense that trying to do φ results in performing φ enough of the time. Since Susie doesn't meet this kind of threshold when it comes to hitting bullseyes, she won't count as being able to hit a bullseye.

The third, and I think most promising, approach encodes control as a presupposition of ability ascriptions. This idea is inspired by a recent proposal of Santorio (2022). On Santorio's account, $A_s\varphi$ says that it is possible that S does φ, and presupposes that S has a state which is

[5] Though they do not ultimately commit to this claim.

causally sufficient for φ in any accessible possibility where S in fact does φ. Causal sufficiency is, in turn, a necessity-like notion, spelled out in terms of causal models. While Santorio doesn't gloss causal sufficiency in terms of control, it is natural to see it (like Fusco's notion of necessitation) as a generalization of the notion of control, since, among other things, it is intended to rule out ability ascriptions in cases like that of the haphazard but lucky dart player. On this approach, it's not true that Susie is able to hit a bullseye, since this has a false presupposition: there are accessible possibilities where Susie hits a bullseye but no state of Susie's is causally sufficient for hitting a bullseye.[6]

The argument I will give below targets all these implementations of the control intuition; I have gone through them to give a sense of different ways the control intuition might be cashed out. By contrast with all these views—which predict that it is clearly not true that Susie is able to hit the bullseye—it follows from Success that it is at least possible that Susie is able to hit the bullseye, since it is clearly possible that Susie will try and succeed at hitting the bullseye, which, given Success, entails being able to hit the bullseye.

The literature contains various arguments for control and against Success. I will rehearse my version of the most famous of these, from Kenny 1976.[7] Alice shuffles a standard deck of cards and places it face down. At 3 pm she will draw a card at random from the deck. Now consider (5-a) and (5-b):

(5) a. Alice can draw a red card at 3 pm.
b. Alice can draw a black card at 3 pm.

According to Kenny 1976, both (5-a) and (5-b) are false. Since Alice doesn't have *control* over the color of the card she draws, she is neither able to draw a red card nor able to draw a black card. But note that Alice *will* draw a red card or a black card. Let's add, moreover, that she is trying to draw a red card and trying to draw a black card (suppose she needs either a hearts or a club to win the game). But then, given Success, it follows that either she can draw a red card, or she can draw a black card. For, reasoning by cases, either (i) she will try to draw a red card, and succeed; or (ii) she will try to draw a black card, and succeed; hence by Success, either (i) she can draw a red card, or (ii) she can draw a black card. (See Boylan

[6] I'm not sure I completely grasp the notion of a state causally sufficing for an action; but, in any case, Santorio discusses cases like that of Susie and is clear that she does not meet this condition.

[7] Another argument, from Santorio 2022, comes from conditionals like (4):

(4) If Susie hits the target out of sheer luck on this throw, then Susie is able to hit the target on this throw.

Santorio argues that a conditional like (4) does not seem like a logical truth, but it should if Success were valid. (4) is certainly an odd sentence to produce, but so are many other logical truths, and it's not clear exactly what intuitions here are tracking; the balance of evidence against the control intuition makes me somewhat inclined to think that (4) just is a logical truth, after all.

2020 for extended recent discussion and defense of similar cases.)

Not only have arguments like Kenny's convinced many that ability requires control, but Santorio (2022) has recently shown how to undermine the argument for Success from incoherence. Recall that argument starts from the observation that sentences with the form $\Diamond(try(S, \varphi) \wedge \varphi(S)) \wedge \neg A_s\varphi$, like 'Susie might try to hit the bullseye and succeed, but she can't hit a bullseye', are generally incoherent. This is nicely explained by Success. But a presuppositional approach along the lines of Santorio's also has an explanation of that fact. On his account, if you leave it open that S will φ, but φ-ing is not in S's control, then the control presupposition of $A_s\varphi$ will not be satisfied, and so neither $A_s\varphi$ *nor its negation* will be assertable, since presuppositions project through negation. Hence a sentence like 'Susie might try to hit the bullseye and succeed, but she can't hit a bullseye' will be unassertable because it has a false presupposition. So Santorio's account undermines the most obvious argument for Success by giving an alternate explanation of the incoherence data that motivate Success.

4 Chancy abilities

Nonetheless, I've become convinced that Success is valid, and hence that ability does not require control. What convinced me was probability judgments about ability ascriptions, which I think provide strong evidence for Success and against the control intuition. In the rest of the paper, I will lay out that argument. I will begin in this section by eliciting intuitions about the probabilities of abilities in a number of cases, and arguing that these really are intuitions about ability ascriptions (rather than about the ability modal's complement). In the following sections I will explore the ramifications of these judgments.

4.1 Cases

Recall that Susie is a haphazard dart player, tossing darts at the board; she can barely hit the dartboard, let alone the bullseye. But every once in a while, she gets a bullseye, just by luck; say this happens once every thousand throws or so. So the probability that she'll hit a bullseye on any particular throw is about .1%. (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.) Now suppose that when the clock strikes 3 pm, Susie will throw a dart at the dartboard. Consider:

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

The obvious answer to (6) is .1%.

Suppose next that Ludwig is going to an audition. Consider (7):

(7) What's the probability that Ludwig can play the Hammerklavier sonata through at the audition without making an error?

Suppose your credence that Ludwig *will* play the sonata through without making an error, conditional on him trying, is 20%. Then, intuitively, the answer to (7) is 20%.

Or consider Ginger, who is standing on the basketball court getting ready to attempt a free throw. Suppose that, conditional on taking a shot, she is 10% likely to make a basket (she's taken hundreds of free throws over the last few weeks, and made 10% of them). What's the chance of (8)?

(8) Ginger can make this shot.

Intuitively, 10%.

For a final case, consider Eli, an otherwise very good cat who really doesn't like getting into his carrier for vet visits. 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 (9)?

(9) I can get Eli into his carrier for this vet visit.

Intuitively, 20%.

These are my intuitions, anyway, and match my informal polling.

4.2 Targeting the prejacent?

Before turning to the upshots of these judgments, let me address an obvious worry about them. The worry is that the probability judgments could be targeting the prejacent of the modal, ignoring the modal altogether (I use *prejacent* somewhat loosely here: the prejacent of $A_s\varphi$ on my usage is $\varphi(S)$). So, for example, in the case of Susie, I said that the chance that Susie will be able to hit a bullseye at 3 pm is intuitively .1%; but this is also the chance that she *will* hit a bullseye at 3 pm, so maybe we are just confusing the prejacent for the modal claim when we assess probabilities.

This objection could be spelled out in two ways. First, von Fintel and Gillies (2008) argue that in general, subjects sometimes focus on the prejacent of a modal claim rather than the modal claim in assessing what was said. Second, and more locally, Bhatt (1999) observes that in some cases an ability claim just sounds equivalent to its prejacent (it has an *actuality entailment*). This comes out most clearly with past-oriented ability claims: 'Ginger was able to make the shot' has a prominent reading on which it seems to be true iff Ginger in fact made the shot. These observations, either separately or jointly, might underly an error theory along the present lines.

On reflection, however, this error theory is untenable. To see this, we simply have to consider cases where the probability of $\varphi(S)$ is clearly different from the probability of $A_s\varphi$: if these clearly diverge, then it can't be that judgments of the probability of $A_s\varphi$ are simply tracking judgments about the probability of $\varphi(S)$.

So, for instance, suppose you're not sure whether Susie will take a shot at 3 pm; say there is a 50% chance she will, and a 50% chance she won't (and this choice is independent of whether she'll hit the bullseye). Given that, the chance that Susie *will* hit a bullseye at 3 pm is .05%: it's the probability that she both tries to make a shot and succeeds. But the chance that she *can* hit a bullseye intuitively remains .1%: that is, it remains the chance that she will hit a bullseye, *conditional on trying to*.

For another case where the probability of the ability claim and its prejacent clearly diverge, suppose that a basketball coach is considering which of five players to choose to attempt a free throw after a technical foul. She asks the assistant coach for advice: 'What's the chance that Ginger can make a free throw right now?' Given that Ginger makes 10% of free throws that she attempts, the answer is intuitively 10%. But this is not the chance that Ginger *will* make the shot, which is much lower, since Ginger might not be substituted in (if you have a uniform distribution over which of the five players will be put in, she has a 20% chance of being substituted in, so there is a 2% chance that she will make a free throw now).

Things are slightly more subtle with past-oriented ability ascriptions, because of actuality entailments.[8] But we can circumvent these issues, because, as Bhatt observed, the actuality entailment is only one *reading* of the ability modal. There are two ways to get at the non-actuality reading. First, we can stick with English but make clear that the action in question was not even attempted.[9] So suppose that the basketball set-up remains identical, but assume that the game happened yesterday. I tell you:

(10) Ginger wasn't substituted in after all, so she didn't attempt a free throw. Still, what's the chance that she was even *able* to make it?

Intuitively, the chance remains 10%, since she makes 10% of the free throws she attempts. But the chance that she *made* the free throw is 0, since we know she didn't make the free throw.

The second option is to turn to language that clearly distinguish perfective and imperfective aspect. As Bhatt observed, in those languages, the actuality reading only arises in the perfective. For instance, consider the Hindi version of our case with Ginger. Keep the set-up identical, but assume that the game happened yesterday; now assume again that we don't know who was substituted in or what happened afterwards. Compare (11) (the past

[8] Why do we need to look at both past and future? We probably don't, but some have suggested to me that judgments about future-oriented ability modals may be muddied by the presence of 'will', which some have argued is itself modal (Klecha, 2013; Cariani and Santorio, 2018; Cariani, 2021).

[9] Thanks to Ginger Schultheis for suggesting this paradigm.

imperfective ability claim) with (12) (its prejacent):

(11) Ginger kal ek free throw kar saktī thī.
Ginger yesterday a free throw make able was-impfv
Ginger was able to make a free throw yesterday.

(12) Ginger kal ek free throw kī thī.
Ginger yesterday a free throw make past
Ginger made a free throw yesterday.

My Hindi informant tells me that (11) has probability 10%, while (12) has probability 2%. Informants tell me that judgments about the corresponding sentences in French, which also distinguishes imperfective from perfective aspect, are the same.[10]

In sum, the probability of $\varphi(S)$ and $A_s\varphi$ can easily diverge. That shows that probability judgments I have elicited about the latter are not in fact about the former after all, putting to rest a natural, but ultimately untenable, error theory.

5 Control vs. Success

In the rest of the paper, I'll explore the upshots of judgments about chancy abilities, arguing that they show that the control intuition is wrong, and instead favor the Success inference, and in particular some form of conditional analysis.

First, a simple methodological claim: whatever you make of them, judgments about the probabilities of abilities must be explained by any theory. Just as in other parts of semantics, judgments about probabilities can play an important role—along with judgments about truth and inference—in evaluating theories of ability. Of course, reasonable caution is always needed: probability judgments cannot always be taken at face value, since humans make systematic errors in reasoning with probabilities. However, the same is plausibly true of judgments about truth and inference, the stock-in-trade of semantic data (see Phillips and Mandelkern 2020 for recent discussion). And when probability judgments *are* the result of a systematic fallacy, as in the case of the base-rate fallacy, they are usually systematically corrigible with more careful reflection or tutelage. I have seen no evidence that probability judgments about abilities are like this. Moreover, the most plausible error theory, addressed in the last section, does not work; and I cannot see any natural alternative.

In any case, everyone should agree that the probability judgments I have elicited are systematic enough that they must be *explained*; I will take them at face value, arguing that we should adopt a theory of ability that makes sense of them directly.

[10]Thanks to Nilanjan Das and Raphaël Turcotte for judgments.

5.1 Against control

Probability judgments show that ability does not require control.

For concreteness, focus on Susie, who is haphazardly chucking darts at the dartboard (the points I make here can easily be made with other cases). If ability requires control, then what is the probability of (13)?

(13) Susie will be able to hit a bullseye at 3 pm.

It depends on how exactly control is incorporated. Above I briefly surveyed three approaches. The first two encoded control via the truth-conditions of ability modals (the first via an extra modal operator, the second via a threshold). On either of those views, (13) is certainly false: it has probability 0. That is simply because we are certain that Susie does not have control over the action of hitting a bullseye at 3 pm.[11] So, on these views, we should equally be certain that Susie is not able to hit a bullseye at 3 pm: that is, that (13) has probability 0.

But this is clearly the wrong verdict. There's *some* chance that Susie will be able to hit a bullseye; specifically, since she has a .1% chance of getting a bullseye, conditional on trying, she has a .1% chance of being able to hit a bullseye. And that's enough to show that ability doesn't require control in a straightforward, truth-conditional way.

What about a presuppositional approach? Recall that on this approach, roughly speaking, $A_s\varphi$ says that $\varphi(S)$ is possible, and *presupposes* that φ is under S's control. We are sure Susie doesn't meet this condition, so, on this account, we should be sure that (13) has a false presupposition. Usually when we are sure that a sentence has a false presupposition and we are asked to judge its probability, there are two intuitions available: one is to find the question ill-formed; the other is to effectively ignore the presupposition—to "locally accommodate" it, treating it as if it were part of the asserted content—and get a judgment of 0. So, for instance, consider (14), which presupposes that Liam has missed a rent payment in the past:

(14) Liam has never missed a rent payment. What's the chance that he'll miss another one?

This just seems like a bad question; but, if forced to come to a judgment about it, it seems like the only thing you can think is that there is no chance that he'll miss another one, since he hasn't missed one in the past. In light of judgments like this, a presuppositional view of 'able' predicts that the question 'What is the chance of (13)?' will strike us as ill-formed, since we know it has a false presupposition; and that, if forced to form a judgment, the only accessible judgment will be 0. So this view cannot account for the observed judgment: namely, that the

[11] If you think that a .1% chance of success is enough for control, lower the rate as much as you like; for any ϵ, no matter how small, if Susie has an ϵ chance of hitting a bullseye when she tries, then, intuitively, she has at least an ϵ chance of being able to a hit a bullseye.

question is perfectly well-formed, and that the chance is .1%.

It is worth considering one further possibility, which is that we might be able to simply ignore presuppositions in forming probability judgments. But this wouldn't help get the correct judgment, because if we set aside the presupposition of 'able', then we should be *sure* that Susie is able to hit a bullseye, since we are sure there is a circumstantially accessible world where she hits a bullseye. This would yield a probability judgment of 1, not the observed judgment of .1%.

While there might be other ways of connecting ability ascriptions to control beyond the three I have sketched here, I suspect that all of them will run aground on intuitions about chancy abilities. If ability requires control, then we can be sure that one of the requirements for (13) to be true is not met, and hence that it has no chance of being true. But (13) clearly does have some chance of being true.

5.2 In favor of Success

Probability judgments also yield a simple but powerful argument in favor of Success.

Recall that Success is the inference from $try(S, \varphi) \wedge \varphi(S)$ to $A_s\varphi$. One striking fact about the probability judgments elicited in §4 is this: the probability of $A_s\varphi$ was always at least as great as the probability of $try(S, \varphi) \wedge \varphi(S)$. Hence, for instance, the probability that Susie will be *able* to hit a bullseye is at least as great as the probability that she will try to hit a bullseye and succeed.

In general, it is a law of probability that, when ρ entails χ, the probability of χ is always at least as great as the probability of ρ. So the fact that the probability of $A_s\varphi$ is always at least as great as the probability of $try(S, \varphi) \wedge \varphi(S)$ would be neatly explained if Success were valid. This provides a powerful abductive argument in favor of Success.

In fact, these judgments equally favor the stronger Strong Success principle, which says that $\varphi(S)$ entails $A_s\varphi$. For, likewise, in all the cases we looked at, the probability of $A_s\varphi$ was at least as great as the probability of $\varphi(S)$, which, again, would be neatly explained if $\varphi(S)$ entailed $A_s\varphi$.

5.3 Kenny's argument

Probability judgments also provide a way to defuse Kenny's argument for control and against Success. Recall that Alice is about to draw a card at random from a fair deck. Kenny claims that both (5-a) and (5-b) are false, since Alice lacks control over the action in question:

(5-a) Alice can draw a red card at 3 pm.

(5-b) Alice can draw a black card at 3 pm.

What's clearly correct in Kenny's case is that you shouldn't *say* either (5-a) or (5-b). But just because something isn't assertable, it doesn't follow that it's false. In particular, the problem with (5-a) and (5-b) might simply be that we don't know which one is true. Probability judgments help distinguish these two statuses and diagnosis the unassertability of these ability ascriptions. What is the probability of these sentences? Intuitively 50%: there's a 50% chance that Alice will be able to draw a red card, and 50% chance that she will be able to draw a black card, since these are evenly distributed in the deck. (For some reason, these judgments are brought out most clearly by focusing on a case where Alice is trying to draw a red card and trying to draw a black card, say, again, because she needs a hearts and needs a clubs.) So, contra Kenny, what makes these sentences unassertable in these cases is not that they are both false, but rather that neither is sufficiently probable to assert in ordinary circumstances.

In sum, probability judgments show that ability does not require control; suggest that Success is valid; and vitiate Kenny's influential argument.

6 Conditional analyses

In this final section, I will argue that probability judgments do even more: they help us choose between the two Success-friendly accounts described at the outset. First, I'll argue that probability judgments favor some form of conditional analysis over the existential analysis. Then I'll address some obstacles to adopting the simplest form of conditional analysis and argue that probability judgments still support whatever more sophisticated conditional analysis replaces it, and indeed that they help address a serious objection to conditional analyses.

6.1 In favor of a conditional analysis

Recall that Hume's conditional analysis (hence the *simple conditional analysis* says that ⌜S is able to φ⌝ has the same truth-conditions as ⌜If S tries to φ, S φ's⌝. So the conditional analysis predicts that the following are pairwise equivalent:

(15) a. Susie will be able to hit a bullseye at 3 pm.
b. If Susie tries to hit a bullseye at 3 pm, she'll succeed.

(16) a. Ludwig can play the Hammerklavier sonata through without making an error.
b. If Ludwig tries to play the Hammerklavier sonata through without making an error, he'll succeed.

(17) a. Ginger will be able to make this shot.
b. If Ginger tries to make this shot, she'll succeed.

(18) a. I can get Eli into his carrier for this vet visit.
b. If I try to get Eli into his carrier for this vet visit, I'll succeed.

Probability judgments provide striking support for these claimed equivalences. In each case, the pairs appear to have the same probabilities. So, for instance, (15-a) has probability .1%, as we have seen; and this is intuitively *also* the probability of the conditional in (15-b). Likewise, (17-a) and (17-b) intuitively both have probability 10%: the chance that Ginger will make the basket, conditional on trying.

So probability judgments support the pairwise equivalences predicted by the simple conditional analysis. They also tell against the existential analysis. What's the probability that there is *some world* compatible with Susie's circumstances and properties where she hits the bullseye? Intuitively, very high: we are sure, or nearly sure, that it's *possible* for Susie to hit a bullseye, given her circumstances and intrinsic properties (recall that she's hit a bullseye in the past under similar conditions). But the probability that she will be able to hit the bullseye is low. So, even though the existential analysis rightly predicts that Success is valid, its predictions are inconsistent with probability judgments about abilities.

We can say more about the patterns of probability judgment elicited above. In all the cases we looked at, the probability of $A_s\varphi$ was equal to the probability of $\varphi(S)$, conditional on $try(S, \varphi)$. So, for instance, if you think there is a 20% chance that Ginger will attempt a free throw, and a 10% chance that she will make the free throw conditional on trying, then the chance that she is *able* to make the free throw is equal to 10%—that is, the chance that she will succeed, conditional on trying. The relation between conditional probabilities and probabilities of conditionals is famously complicated (see Khoo and Santorio 2018 for a helpful recent overview). But nearly everyone agrees that simple conditionals (conditionals which don't embed modals or conditionals) have a prominent interpretation on which their probability is equal to the probability of their consequent conditional on their antecedent. Hence, for instance, the probability of (19), on the most obvious interpretation, equals the probability of the coin landing heads conditional on the coin being flipped.

(19) If I flip the coin, it will land heads.

Given this generalization, it follows that the conditionals of the simple conditional analysis, with the form $try(S, \varphi) > \varphi(S)$, will *also* have (as a default matter) the probability of $\varphi(S)$ conditional on $try(S, \varphi)$. In other words, given the well-established connection between conditionals and conditional probabilities, the simple conditional analysis can explain the observation that the chance of $A_s\varphi$ is the chance of $\varphi(S)$ conditional on $try(S, \varphi)$.

A natural thing to ask for at this point is a semantic model for the probabilities of conditionals which, together with the conditional analysis, would yield all the judgments we've seen so far. Easy: just pick a model for the probabilities of conditionals which yields the connection between conditionals and conditional probabilities—there are a number of contenders (e.g. van Fraassen 1976; McGee 1989; Bradley 2012; Kaufmann 2009; Bacon 2015; Goldstein and Santorio 2021; Khoo 2022)—and combine it with the conditional analysis of ability. I won't go into this in any detail here, since there is no need to commit to one of these models for present purposes. (There are, of course, analyses of the conditional on which it encodes a kind of necessity, and hence which do *not* vindicate a connection between conditionals and conditional probabilities, like those of Lewis 1973; Kratzer 1981. Adopting the conditional analysis of ability in concert with one of those analyses of conditionals would hence not do anything to make sense of probability judgments about abilities. So probability judgments favor a conditional analysis only if we spell out the latter with a conditional operator that can account for probability judgments about conditionals. But that's something we need to do in any case.)

6.2 Problems for the conditional analysis

There is a hiccup: the simple conditional analysis has serious problems, and can't really be correct. However, more sophisticated views in the spirit of the conditional analysis have been developed in response to these problems, and probability judgments still favor a view along those lines, even if the simplest version of the conditional analysis is untenable.

The simple conditional analysis (hence *SCA*) faces an array of related problems (see Mandelkern et al. 2017 for an overview). I'll briefly summarize two key issues. First, the SCA, although it validates Success, doesn't account for incoherence data in the neighborhood of those that I used above to motivated Success. For instance, consider (20):

(20) #Susie might go to the second floor, but she can't go to the second floor.

(20) is incoherent. But the SCA can't account for this. For suppose that Susie has stepped into an elevator on the ground floor of a three-story building. Unbeknownst to her, the buttons for the second and third floor have their wires crossed, so that if she tries to go to the second floor, she'll go to the third floor; but she might still end up on the second floor, if she hits the button for 3. According to the SCA, then, (20) is true: Susie is not able to go to the second floor, since it's not the case that, if she tries to go to the second floor, she'll succeed, but she might go to the second floor, since she might hit the button for 3 and end up on the second floor. Schematically, there is nothing incoherent about $\Diamond\varphi(S) \wedge \neg A_s\varphi$ on the conditional analysis provided that S would not φ if she tries to φ, but might φ some other way.

In other cases, the SCA appears too strong. For instance, consider (21), based on Vranas 2010:[12]

(21) David can breathe normally for the next five minutes.

[12] Compare Austin (1961)'s golfer.

(21) is intuitively true—David is normal, breathing-wise—but if David *tries* to breathe normally, he'll focus on breathing normally and then will fail to do so; so the SCA predicts that (21) is false.

Mandelkern et al. (2017), developing an idea of Chisholm 1964's, argue that the spirit of the SCA can be saved with a relatively minor revision: namely, by putting the conditional in question underneath an existential quantifier over a set of actions. According to the *act conditional analysis*, or *ACA*, S is able to φ just in case there is *some* contextually salient action ψ such that, if S tries to do ψ, she does φ. That is, where $\mathcal{A}_c$ is a set of contextually salient actions:

$$\textit{Act Conditional Analysis}\text{: } [\![A_s\varphi]\!]^{c,w} = 1 \text{ iff } \exists\psi \in \mathcal{A}_c : [\![try(S,\psi) > \varphi(S)]\!]^{c,w} = 1$$

There is much to say about the motivation for a view like this; for the sake of brevity, let me just highlight how this approach can solve the two problems just sketched, taking them in reverse order. How can David breath normally? Well, by trying to do something else, say, play piano for a few minutes. So the ACA rightly predicts there is a true reading of 'David can breathe normally', since there is *something* such that if he tries to do it, he breathes normally. By letting the action the agent tries to do come free from the modal's prejacent, the ACA can account for cases where you are able to do something by trying to do something else.

And by existentially quantifying over actions, the ACA gets a strong enough meaning for negated ability ascriptions to account for incoherence data like (20). If Susie can't get to the second floor, then there is *nothing* such that, if she tries to do it, she will get to the second floor, accounting for the incoherence of (20) and sentences like it (and, more generally, (nearly) validating Strong Success).[13]

So the extra quantificational resources of the ACA let it avoid the problems we just surveyed for the SCA. Of course, there is much more to say about the pros and cons of the ACA. My goal here is not to defend it, but rather to point out that the problems for the SCA can be avoided with a view that still captures much of the spirit behind it, and, in particular, that the ACA, or some view like it, can still account for the probability judgments brought out here, in the same way as the SCA. This is simply because the ACA coincides with the SCA whenever (i) φ is contextually available and (ii) none of the other contextually available actions are such that, if S tries to do them, she'll do φ. These assumptions are plausible in many cases (Mandelkern et al. (2017) describe them as natural defaults), and so the ACA agrees with the SCA in many cases—including, plausibly, the cases we've looked at here.

With this in hand, we can return to probability judgments and restate their upshot more carefully. Probability judgments about ability ascriptions support an analysis of ability on

[13]Nearly: the inference from $\varphi(S)$ to $A_s\varphi$ will go through provided that, whatever S tried to do in bringing about φ is salient in the context. You might still worry about cases where S does φ without trying anything. These cases may be ruled out by the selection restrictions on 'able', however.

which the probability of $A_s\varphi$ is, *as a default matter*, the probability of $\varphi(S)$ conditional on $try(S, \varphi)$. Hence they support any analysis that agrees with the SCA as a default matter. The ACA is one such theory; others may prefer some other variant on the conditional analysis, but everyone must account for the central generalization here, which seems to favor some form of conditional analysis.

6.3 Chancy abilities and the ACA

While defending the ACA in particular is not my principal aim here, it is worth very briefly exploring whether probability judgments still support the ACA where it *diverges* from the SCA. If yes, then that provides a new source of evidence for the ACA; if not, then my broader point in this section still stands, namely, that we need some theory of ability which, as a default matter, closely ties the probability of ⌜S is able to φ⌝ to the probability of S φ-ing, conditional on trying.

In some cases, probability judgments clearly favor the ACA. What's the chance that David can breathe normally right now? Around one: it's the chance that there's *something* such that if he tries to do it, he'll breathe normally, just as the ACA predicts. For another kind of case where the ACA's judgments seem correct, suppose Louise is considering buying a ticket for a lottery. A winning number will be chosen at random between 1 and 1000; anyone holding a ticket with that number wins. What's the chance that Louise can win the lottery? There seem to be two judgments available here:

(a) One in a thousand: that's the chance that Louise will win, conditional on trying to win (i.e., buying a ticket).

(b) One: after all, all that Louise has to do to win is buy a ticket with the winning number, but she can certainly do *that*, since she can buy any ticket.

The SCA predicts only the first judgment of .1%. By contrast, the ACA predicts both judgments are possible, depending on the context. The first judgment will be obtained by treating the contextually available actions as {*buy a ticket*, *don't buy a ticket*}, since the probability that one of these actions is such that, if Louise tries to do it, she wins the lottery, is .1%. The second judgment is obtained by taking a more fine-grained view of Louise's options, along the lines {*don't buy a ticket*, *buy ticket 1*, *buy ticket 2*, ... *buy ticket 1000*}: it is certain that one of these actions is such that, if Louise tries to do it, she'll win the lottery.

So far, then, probability judgments seem to speak in favor of the ACA in cases where it diverges from the SCA. In some other cases, things are less clear, as Ben Holguín and an anonymous reviewer have both pointed out. Suppose that Ann is handed two fair decks of cards: Deck 1 and Deck 2. What is the chance that she can draw a clubs from one of the decks without looking? Intuitively, it is $\frac{1}{4}$: it is the chance that she will draw a clubs, conditional on trying. This is the verdict of the SCA, and it is the verdict of the ACA on a coarse-grained resolution of the contextually available actions as something like {*draw a card from either deck*, *don't draw a card from either deck*}. But the ACA also predicts another judgment, when we fine-grain the available actions to {*draw a card from Deck 1*, *draw a card from Deck 2*, *don't draw a card from either deck*}. In this case, the ACA 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. The third disjunct has probability 0, so ignore it. Disjuncts (i) and (ii) have probability $\frac{1}{4}$ each. And, importantly, they are independent of each other—which means, by the laws of probability, that their disjunction has probability $\frac{1}{4} + \frac{1}{4} - (\frac{1}{4} * \frac{1}{4}) = \frac{7}{16}$. However, it is not clear that there is a reading of 'Ann will be able to draw a clubs' on which is has $\frac{7}{16}$ probability.

This may be a serious problem for the ACA. But I am not certain. The ACA says that, on the fine-grained resolution of practically available actions, the chance that Ann will be able to draw a clubs is the chance that one of the decks is such that, if Ann tries to draw a card from it, she'll draw a clubs from it. What is the chance of that quantified conditional? Well, we have just seen an argument that it is $\frac{7}{16}$. But informal polling suggests that many have the intuition that it is in fact $\frac{1}{4}$. This is either because people are bad at calculating the probabilities of disjoined/quantified conditionals, or because disjunction/quantification interacts with conditionals in strange ways. In fact, there is independent evidence that one or both of these things is true: people have very strange judgments about the probabilities of disjoined conditionals (see Santorio and Wellwood (2023) for experimental evidence to that effect). So I am not sure that the ACA's predictions are wrong here. It is plausible that the chance Ann can draw a clubs is the chance that one of the decks is such that if Ann draws a card from it, she draws clubs. The oddness seems to arise, not from this equivalence, but rather from judgments about the chance that one of the decks is such that if Ann draws a card from it, she draws clubs; there is a puzzle here, but it may be a puzzle about conditionals rather than the ACA.

In any case, let me reprise the dialectic. My basic point is that probability judgments favor an account on which the probability of $A_s\varphi$ is, as a default matter, equal to the probability of $\varphi(S)$ conditional on $try(S, \varphi)$. The ACA yields one such account, and its judgments in cases where it diverges from the SCA seem defensible to me. Those who are not convinced will need to look for another account. But I think it is clear that probability judgments favor some form or other of conditional account, whatever the details turn out to be.

6.4 Non-agential ability ascriptions

In this final section, I'll argue that probability judgments not only provide support for a form of conditional analysis but also help answer an important objection to any broadly conditional analysis.[14] Conditional analyses essentially involve the notion of trying.[15] However, there are cases where we apparently ascribe abilities to non-agents, as in (22) (from Irene Heim, attributed to Maria Bittner) or (23):

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

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

I will argue here that probability judgments suggest that these cases are actually very different: (22) is an ability ascription, where the trying is done by a covert, generic agent, while (23) is a circumstantial modal. Neither is a problem for a conditional analysis.

Start with (22). Suppose that I tell you 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, what's the probability of (22)? Intuitively, 70%. That is, credences in this case still seem to track conditional probabilities, in exactly the way that the conditional analysis suggests: the probability of (22) is the conditional probability of the elevator succeeding at carrying three thousand pounds, if you try to make it carry three thousand pounds. Of course, it's not the elevator that's trying. But (generic) *you* can try loading the elevator, and that seems to be what (22) is talking about: what happens *if you try*. That suggests an analysis of sentences like (22) along the lines of a conditional analysis, but with a covert generic agent.[16]

Now turn to (23). Appealing to a covert generic agent obviously won't help here: the sentence clearly has nothing at all to do with agents, generic or otherwise, trying to do things. So this is, on the face of it, a harder case for any form of the conditional analysis. But now note that this case also seems totally unlike all the cases of ability ascriptions we've looked at so far vis-à-vis probabilities. In all the cases we've looked at, there is a very salient probability judgment about the ability ascription in question which matches a salient *conditional* probability judgment. But this doesn't seem to be true in this case. Suppose that the black hole has a 70% chance of swallowing the galaxy conditional on such-and-such physical processes taking place in the galaxy, and no chance otherwise. I don't see any way of filling in 'such-and-such' that makes it intuitive for your credence in (23) to be 70%.

What *should* your credence in (23) be? Well, it seems like it should just track your credence that there is *some* possibility that the black hole absorbs the galaxy. As always, there is

[14]Thanks to Cian Dorr for suggesting this line of argument.

[15]Or, in a recent variant in Setiya 2023, the notion of *intending*.

[16]This is something Mandelkern et al. (2017) suggest about cases like this.

context-sensitivity here, but (23) seems to just be saying that it is consistent with the black hole and galaxy's physical properties, and the laws of physics, that the former absorb the latter. Suppose for instance that you are sure that physical law and the black hole and galaxy's structure are consistent with the black hole absorbing the galaxy. Then it seems you should be sure of (23). Suppose instead that we are *unsure* what kind of black hole it is; your credence that it is big enough to absorb the galaxy is 70%. Then intuitively your credence in (23) should be 70%. Conditional probabilities don't seem to essentially enter the picture. Instead, the meaning of 'able' in (23) really seems to be that of the diamond of modal logic.

Given that modal words are generally polysemous (in English, as well as many other languages), it would be unsurprising to find that 'able' has readings where it is used as a circumstantial modal, in addition to those where it is used as an agentive modal. Adverting to polysemy like this would be theoretically unsatisfying if we were just using it to explain away counterexamples to a conditional analysis of the agentive reading. But probability judgments support the hypothesis that there is something very different going on in (23) than in the cases we have looked at: these judgments suggest that, when 'able' is used to talk about scenarios where no agent is (or could be) involved, it is interpreted as an existential circumstantial modal.

7 Conclusion

Many have thought that ability requires control, so that for Susie to be able to hit a bullseye, hitting bullseyes must be somehow in her control. But probability judgments about ability ascriptions show that this thought, intuitive as it is, is wrong: ability is compatible with lack of control. By contrast, success, no matter how fluky, suffices for ability. Moreover, probability judgments support some form of conditional analysis of ability, since, as a default matter, the probability that S can φ is equal to the probability that S will φ, conditional on trying to.

Of course, all this is compatible with there being indirect connections between ability and control. Being in a position to *assert* or *know* a future-oriented ability ascription may only be possible if you know that the agent has control over the relevant action. Likewise, *general* ability ascriptions—the kind of thing we express with 'Susie is generally able to hit bullseyes', or 'Susie has the ability to hit bullseyes'—very plausibly involve control. But probability judgments show that these connections between ability and control are not encoded in the truth-conditions (or presuppositions) of ability ascriptions. Ability does not entail control; success does entail ability.

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