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Outline

1) Similarity-based epistemologies of modality
2) Ability and know-how as modals
3) Ability and know-how from similarity
4) Relevant similarity for ability and know-how
5) Learning how inductively

Similarity-based epistemologies of modality

Recent work on the epistemology of modality has tried to develop empiricism-friendly approaches.

As an empiricist, I appreciate this.

A prominent strand of modal empiricism* consists in the development of induction-based approaches (as opposed to affordance-based, abduction-based, etc.). Supposing that induction can provide with justification, or even knowledge, it is worth considering whether modal justified belief or knowledge can be acquired through inductive methods (Roca-Royes (2016), Roca-Royes (2024), Schoonen (2020), Schoonen (2022), Dohrn (2018), Hawke (2010), Hawke (2016), Leon (2016)).

I am a pluralist about the sources of modal justification, so I am not committed to inductive-methods being the only way to acquire modal justification.

A common way to spell this out takes the form of similarity-based modal epistemologies, where the support for the inductive step that leads to modal knowledge is mediated by similarity judgments or assessments.

Roca-Royes on similarity-based knowledge of *de re* possibility

For sake of simplicity, I will assume that we might want to adopt something like Roca-Royes (2016) account.

According to this, we can obtain knowledge of *de re* possibility about concrete entities through a process where:

1) We come to know that something (φ) about some concrete entity o has happened, so we infer that it was possible.
2) We recognize that some other concrete entity o' is, with regard to some contextually salient respects, relevantly similar to o
3) We inductively reason that something φ' like φ could happen to o'

This seems to capture ordinary reasoning about certain possibilities fairly well:

Roof Parts of my neighbor's metal roof were blown away by the force of last night winds. So, clearly, they could have. Our own metal roof was built similarly to our neighbors' out of similar materials, so (it is reasonable to believe that) our roof could have been blown away by the force of last night winds.

Challenges: scope, relevant similarity

Scope Does this kind of modal epistemology have the resources to deal with a broader range of possibilities? (cf. Hartl (2015), Roca-Royes (2024))

Relevant similarity How should we account for *relevant* similarity? (cf. Mallozzi et al. (2024), Schoonen (2022))

The issue of relevant similarity is crucial to deal with the scope question: without an account of relevant similarity for a domain of concerns, we cannot assess the scope of what is knowable through these methods about this domain.

The status of the T principle ($\varphi \to \Diamond\varphi$) is slightly problematic, since if a priori it undermines the empiricist credentials of the approach. I think there are ways to explain the principle on empiricism-friendly grounds, so I don't think this is very troublesome.

The goal here

Here, I want to extend this approach to handle ability and know-how modals.

Both ability and know-how are well known to have a modal aspect, but their treatments as modalities is fairly complicated.

Why worry about them, then? They seem to be very important in our overall modal conceptual scheme: they are practically indispensable kinds of modality.

Vetter (2023), myself in my thesis (2021) (cf. also Morales Carbonell (2023a)), and recently Oliver Mesa (wip) have emphasized the need to take an agency-focused approach to the epistemology of modality.

Vetter (2024) has, however, argued that similarity-based approaches such as Roca-Royes' cannot handle ability. My goal is to show that they can (and also handle know-how).

The rough idea

The intuition: something like this is true:

Procedural similarity principle (PSP) If it is reasonable to believe that task t could be done by φ-ing, and φ'-ing appears relevantly similar to φ-ing, then it is reasonable to believe that t could be done by φ'-ing.

Then, we can reason as follows:

1) Joe could tie his laces once,
2) Tying some laces once is relevantly similar to tying some laces twice,
3) Joe could tie his laces twice

But this is too simple and narrow.

Practical modals

A guiding idea: we can characterize (individuate) practical kinds of possibility in terms of four things: a specific modal, an agent (or collection of agents), a set of tasks, and a set of ways (to perform those tasks). The general form of a practical possibility is: it is k-possible for agent a to succeed at task t in way w. Some practical possibilities are possible tries instead of successes. We disregard that here for simplicity.

Then, we may think that the following holds:

Success principle (SP) If it is reasonable to believe that agent s has succeeded in task t by w-ing, it is reasonable to believe, for some kind of practical possibility k, that it is k-possible for s to t (that is, to succeed at t) by w-ing.

This is a generalized practical version of the principle that says that if something has happened, it is possible. Note, however, that the kind of possibility is not fixed. However, we have three candidates: circumstantial possibility ($\Diamond_c$), ability ($\Diamond_a$), and know-how ($\Diamond_h$).

Three dimensions of practical modality

From this characterization of practical modals, it follows more or less straightforwardly that we have to consider *at least* three cases:

a) If different agents are relevantly similar, it is practically possible for them to do the same tasks (maybe in the same way).
b) If different tasks are relevantly similar, it is practically possible for the same agent to do them (maybe in the same way).
c) If different ways to do something are relevantly similar, it is practically possible for the same agent to do that task in either way.

Agents	**Tasks**	**Ways**
For some modality k, if it is reasonable to believe that it is k-possible for agent s to do task t by w-ing, and agent s' is relevantly similar to s, it is reasonable to believe that it is k-possible for s' to t by w-ing.	For some modality k, if it is reasonable to believe that it is k-possible for agent s to do task t, and task t' is relevantly similar to t, it is reasonable to believe that it is k-possible for s to t'.	For some modality k, if it is reasonable to believe that it is k-possible for agent s to do task t by w-ing, and way w' is relevantly similar to w, it is reasonable to believe that it is k-possible for s to t by w'-ing.
1) $\Diamond_k \sigma(s,t,w)$ 2) $s' \sim s$ 3) $\Diamond_k \sigma(s',t,w)$	1) $\Diamond_k \sigma(s,t,w)$ 2) $t' \sim t$ 3) $\exists w' \Diamond_k \sigma(s,t',w')$	1) $\Diamond_k \sigma(s,t,w)$ 2) $w' \sim w$ 3) $\Diamond_k \sigma(s,t,w')$

What is valid for what?

That is the general idea. But we need to show that the relevant modalities actually validate these principles (or similar ones).

We need to check:

- The success principle,
- The principle for agents
- The principle for tasks,
- The principle for ways

The success principle

For $\Diamond_c$, the principle is valid: if someone does something, it is circumstantially possible that they do it.

For ability, the straightforward version is invalid: that someone succeeds at a task is not sufficient to say that they are able to perform it. But we might want to say that successes that satisfy certain additional conditions are sufficient: for example, evidence that someone has succeeded repeatedly at a task might be evidence that they have a certain ability.

! Incidentally, this undermines Vetter's criticism.

Similar considerations are true of know-how.

The principle for agents

The principle has true instances for circumstantial possibility and ability.

For ability, the distinction between *narrow* and *wide* abilities can be relevant. The similarity between agents might suggest that their narrow abilities are similar, even when they can be different in a wide sense.

For the case of know-how, the same holds. In some cases we worry about the subject's state independently of their circumstances (someone could know how to do something that they are unable to do in the wide sense).

In other cases, know-how seems to couple the agent and their environment.

The principle for tasks

The principle for tasks requires that we make a theoretical choice.

It is initially plausible that if it is circumstantially possible for someone to perform a task, and there is a relevantly similar task, it is circumstantially possible for them to do that task. But this seems to assume:

Poss-ability principle If s has the ability to t, it is possible for s to t.

If someone is able to do something, by this principle, it is also circumstantially possible for them to to it.

Some authors, such as Spencer (2016) and Effingham (2020), reject this principle. However, they could accept the principle for tasks in the case of ability without accepting the parallel principle for circumstantial modality.

For the case of know-how, we have to deal with certain subtleties that come from the Intellectualism/ Anti-intellectualism debate.

If one accepts Anti-intellectualism, everything works more or less as it does in the case of ability.

If one accepts Intellectualism, similarity will not seem sufficient to allow us to pass from someone knowing how to do a task to knowing how to do another (the agent may ingnore the similarity and thus fail to be in a position to grasp how to do that task).

So perhaps we should adjust the principle accordingly:

Intellectualist Trade principle for know-how If it is reasonable to believe that if agent s knows how to to do task t, and s knows that task t' is relevantly similar to t, it is reasonable to believe that s knows how to t'.

It is important that the similarity of tasks is *exploitable* by the agent.

The principle for ways

The principles for ways are in a similar situation.

For circumstantial possibility, the principle is plausible on the assumption that the worlds where the agent does the task acting in a similar way are possible.

For the case of abilities, we will want to appeal to the fact that different abilities might have different degrees of generality: acting in a particular way usually exercises more general abilities that can also be exercised in similar ways, so in general being able to do something in some way is evidence that one can do it also in a similar way.

For someone to know how to do something in a way that is similar to some way in which they know how to do a task, it might be necessary for them to recognize that this way is similar to the way that they are already acquainted with.

Context-sensitivity

Ability modals are known to be (massively) context-sensitive (cf. Lewis (1976)).

The situation is similar in the case of know-how attributions. Consider this case, from Hawley (2003):

> Sarah knows how to drive under some but not all circumstances; she knows how to perform some driving tasks, but not others. It is nevertheless tempting to ask *but does she know how to drive?* There is, however, no unique task or range of tasks which is always invoked when we ask whether someone knows how to drive. Rather, different tasks are salient in different conversational contexts. For example, in a UK context, it would be reasonable to infer from Sarah's knowing how to drive that she knows how to drive a manual, stick shift car. In most US contexts, however, this would not be a reasonable inference. To take a different example, a child might be said to know how to cook if she knows how to use the stove safely, whilst we would set standards higher (have a different task in mind) for an ordinary adult's "knowing how to cook," and set them higher still when discussing a chef in training.

Stanley (2011): the domain of relevant ways to act shifts with context.

Wallbridge (2018):

Contextualist subject-sensitive intellectualism In a context c, s knows how to t if and only if there is a way w such that s knows of w thaat is is a way in which P_c (a contextually-defined set of people) could x,

Morales Carbonell (2023b):

Contextualist subject- and fact-sensitive anti-intellectualism In context x, s knows how to t if and only if $P_c(s)$ (a contextually-defined set of people in some contextually-defined relation to s) are able_f to t, where able_f is a type of ability relative to a contextually-defined set of facts f.

A suggestion: similarity considerations ground these explanations: the context selects different sets of people because of similarity considerations.

Relevant similarity

The sketched argument schemes refer to similarity nof agents, tasks and ways. We could devise independent accounts of each of these kinds of similarity.

However, I want to suggest, we might want to take a reductionist approach to relevant similarity in the context of practical modals. Taking ways as basic:

- Relevant similarity of tasks consists in similarity in the ways in which the task can be done
- Relevant similarity of agents consists in similarity of tasks which agents could do.

Ways

Stanley & Willlamson (2001): ways are properties of token events (events happen in certain ways).

Bengson & Moffett (2012): *methods* are sequences of action types whose execution is an act.

Here: ways are structures of action *arrangements* intended to execute a task. Sequentiality is not essential.

We can represent ways as directed graphs: each vertex is an action and edges would represent transitions between actions. Actually, we can use heterogeneous graphs to represent these structures, but we can omit the relevant complications here.

Then, the problem of similarity reduces to the problem of giving an account of graph-similarity for this class of graphs.

Graph similarity

Consider the simplest case, which is that of a sequence of actions. Each action except the last has some effects that enable the transition to the next action.

Accordingly, one way for two ways to be similar is that the actions that it is composed of have similar effects that enable the same (or similar) transitions.

We can think of this in terms of certain possible edits to the graph that represents a way.

An edit to a graph consists of adding or deleting vertices or edges. Given a sequence of edits, you can turn a graph G into any other arbitrary graph G' . Suppose that there is a minimal sequence of edits that can transform G into G'. Then, the length of this sequence can serve as a measure of similarity between graphs. Now, add the restriction that edits must conserve similarity of effects.

The length of the minimal sequence of edits that respect this constraint and that lead from one graph to another corresponds to their degree of similarity.

Problems

- Vastly different actions can have similar or equal effects.
- We might not be in a position to evaluate the distance in terms of the effects.
- The scheme is not sensitive enough to structure.

A proposal

I want to propose that the relevant kind of similarity for ways is similarity with respect to vertices in the graph, together with similarity of structure.

Take the minimal description length representation of a graph as the shortest representation of the graph in terms of a hypothesis about the structure, and a representation of the edits that are necessary to recover all the details of the graph (cf. Grunwald (2004).) Morales Carbonell (2023c) applies similar ideas to the case of understanding.

When comparing the similarity of two graphs, first produce the minimal description length representation of one of them ($M_1 = \langle H_1, E_1 \rangle$), extract the hypothesis and then calculate the minimal representation of the edits on the hypothesis that would produce the second graph ($E_2 = e(H_1, G_2)$). Then, you get a representation of the second graph that is equivalent to $\langle H_1, E_2 \rangle$. The difference in length between E_1 and E_2 can serve as a measure of similarity between the graphs.

Because this representation is based on a description of the structure of these graphs, this measure is adequate to capture the idea that similarity is a function of both the actions involved in the way (vertices) and the overall structure of the ways.

When we assess the similarity of ways we do not necessarily go through this process; rather, we approximate it by reasoning inductively on the basis of the surface properties of ways.

Summing up

Similarity-based reasoning is a viable source of ability knowledge and know-how knowledge.

While it mught depend on independent sources of ability knowledge and know-how knowledge, this is not a problem from a perspective that endorses pluralism about the sources of modal knowledge (a perspective which I think empiricist approaches *should* take).

Something I left aside in this talk, but which is of particular interest, is the link between know-how knowledge and know-how. Can we acquire know-how through these methods of know-how knowledge acquisition? Intellectualism would suggest that yes, but I am not sure.

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Thanks!

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