



# I know how to withstand the skeptic

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## Abstract

A prominent class of arguments for external world skepticism rely on the plausible view that knowledge is closed under logical entailment. From the fact that one does not know that one is not a handless brain in a vat it can be inferred that one does not know that one has hands, in virtue of the fact that having hands logically entails that one is not a handless brain in a vat. The complements of knowing-how ascriptions, however, are not—obviously, at least—related by logical entailment to any proposition, and therefore, they resist that skeptical argument. Even if I don't know that I am not a brain in a vat, it does not follow that I don't know how to, say, play a drum rudiment. Thus, knowing-how can withstand closure-based skepticism about the external world.

## 1 The argument

The paradiddle is the king of drum rudiments. To play a single paradiddle, you ought to perform the following pattern with a steady, uniform rhythm: R-L-R-R-L-R-L-L... (where R and L stand for beats with the right and left hand or foot). Different variations of the single paradiddle are generated by starting at different points of the pattern. Thus, RLRLRL... is one variation; LRRLRL... is another variation, RRLRLRL... is another, and so on. It is immaterial to use drumsticks, or a drum. To play a single paradiddle is, essentially, to play that pattern. I know how to play a single paradiddle. Or at least I think so. It was one of the first rudiments I learned, and I suffered through the years mastering it. But what if I am a handless brain in a vat? What if I never touched a drumstick, or a real drum? What if Eric—my drum

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instructor—was a cleverly disguised mule? Here I argue that all of that is consistent with my knowing how to play a single paradiddle.<sup>1,2</sup>

A prominent class of arguments for external world skepticism purports to defeat quotidian, contingent propositional knowledge relying on a principle of epistemic closure under logical entailment.<sup>3</sup> For any two propositions  $p$  and  $q$ :<sup>4</sup>

**Closure.** If  $p$  logically entails  $q$ , then if  $S$  knows that  $p$ ,  $S$  knows that  $q$ .

Because knowledge is closed under logical entailment, if you don't know that a preposterous possibility does not obtain, and such preposterous possibility logically entails the falsity of a seemingly quotidian proposition, then you don't know that the quotidian proposition is true either. This version of the *Skeptical Argument based on Closure* (SAC) can be stated as follows (where  $p$  is a preposterous proposition, e.g., *that I am a handless brain in a vat* and  $q$  is a quotidian proposition, e.g., *that I have hands*):

1. I don't know that not- $p$ . (premise)
  2.  $q$  logically entails not- $p$ . (premise)
  3. If I know that  $q$ , then I know that not- $p$ . (2, **Closure**)
- ∴ I don't know that  $q$ . (1, 3, *modus tollens*)

But what about knowing-how ascriptions? Does not knowing that I am not a handless brain in a vat imply that I don't know, e.g., how to play a single paradiddle? Not in virtue of **Closure**, as **Closure** is designed to apply to propositional knowledge, and knowing-how ascriptions do not ascribe propositional knowledge—at least not obviously (see below). Put differently, logical relations require propositional arguments (*that*-clauses) and, since know-how ascriptions do not take propositional complements, they are immune to SAC.

We can see this from a syntactic as well as a semantic point of view. Syntactically, the complements of knowing-how ascriptions are infinitival questions (e.g., *how to play a single paradiddle*, (see Bhatt, 2008, ch.4)), not sentences (e.g., *that I have hands*). Semantically, such complements arguably denote dispositions, skills, or abilities, instead of facts or propositions (Ryle, 1949, a.m.o.). This suggests that knowing-how ascriptions lack the right syntax and semantics to interact with **Closure** in the manner required to motivate SAC. If this is right, this version of SAC cannot get off the ground. Thus, knowing-how ascriptions are immune to closure-based arguments for external world skepticism.

<sup>1</sup> The view that practical knowledge is immune to external world skepticism is not new. According to some interpreters, it can be found in the *Zhuangzi* (Chiu, 2018; Ivanhoe, 1993), and authors like Dewey (1929) or Santayana (1955) gesture in that direction. My purpose is to offer a precise statement of this idea.

<sup>2</sup> I do not claim that from the truth of a knowledge-how ascription one may arrive at standard, propositional knowledge about the external world. That is a different project altogether. My aim is to argue that knowledge-how withstands a certain skeptical position, not that it defeats it.

<sup>3</sup> Other, well-known arguments for external world skepticism include underdetermination arguments (see e.g. Douven, 2013; Yalçın, 1992). In what follows, I set underdetermination arguments aside, and focus solely on closure-based arguments. I also set aside considerations in favor of *global* skepticism, which would arguably defeat all knowledge whatsoever, including knowing-how.

<sup>4</sup> See e.g., (Stine, 1976, a.m.o.), although Stine did not subscribe to this particular formulation. Many authors propose a weaker version of **Closure** stating its conclusion in terms of e.g., *being in a position to know*, but I stick to the stronger formulation for simplicity. This applies as well to the formulation of **Luminosity** further below. My argument does not rest on this.

## 2 Three objections

Can we claim to have established that knowing-how ascriptions survive SAC? Not so fast! In the remainder of this paper, I lay out and reply to three possible objections to that conclusion.

### 2.1 First objection: intellectualism about knowing-how

Intellectualists about knowing-how defend the view that knowing-how ascriptions are knowing-that ascriptions in disguise (Stanley & Williamson, 2001). That is, for an intellectualist, a knowing-how ascription describes a relation between a knower and a proposition. If intellectualism is true, then the complements of knowing-how ascriptions are propositions, which stand in relations of logical entailment to other propositions, and can therefore set off SAC. Let us formulate Stanley & Williamson's intellectualism:

**Intellectualism about knowing-how.**  $S$  knows how to  $\varphi$  iff  $S$  knows, of some way  $w$  for  $S$  to  $\varphi$ , that  $w$  is a way that  $\{S \text{ herself} / \text{one}\} \{\text{could} / \text{should}\} \varphi$ .<sup>5</sup>

Applied to our example, for me to know how to play a single paradiddle is for me to know, of some way  $w$  for me to play a single paradiddle, that  $w$  is a way that I myself [one] could [should] play a single paradiddle. Before we look at the consequences of this analysis for my argument, let us make two comments.

First, the intellectualist analysis quantifies over *ways* of doing things. We can think of ways in two ways (no pun intended). On the one hand, it is intuitive to think of ways similarly to how we think of possible worlds: as *maximally specific* properties of actions. Under this view, any way of playing a single paradiddle would include lots of specifications and details, many of which do not matter for a successful performance. E.g., in this sense, one way of playing a single paradiddle is to play the pattern RLRRLRL... with drumsticks on a white drum; another one is to play it with one's hands on a pillow; and so on. On the other hand, when we teach and learn how to do things, we naturally discard many of those details and specifications as unimportant. When I was taught how to play a single paradiddle, I was taught the pattern—not the other, unimportant details. This suggests that we think of ways, not as maximally specific properties of actions, but as sets thereof (just like we often think of propositions as sets of possible worlds). I do not have any strong argument in favor of either view, but the latter might seem preferable in light of these considerations about teach- and learnability. So I will assume that the intellectualist is quantifying over sets of maximally specific properties of actions, and not over those properties themselves.

<sup>5</sup>There are two important ambiguities in Stanley & Williamson's *definiens*. First, the complements of knowing-how ascriptions include an infinitival complement (*to play a single paradiddle*) whose subject is a phonologically silent pronoun that can be interpreted as either denoting the *knower* (interpreted *de se*, thus the qualification ' $S$  herself') or an indeterminate subject, which can be paraphrased as 'one'. Stanley and Williamson focus on the first reading, but the indeterminate reading is admissible as well (see Pavese 2016, 650–2; Stanley & Williamson 2001, 436). Secondly, the modal in a know-how ascription can be interpreted as 'should' or 'could'. Stanley and Williamson focus on the latter reading, since that is the reading 'at issue in philosophical discussions of knowledge-how' according to them (2001, 425). However, I will argue below that the former interpretation is correct—at least in examples such as ours.

Secondly, Stanley & Williamson hold that knowing-how, although propositional, must be held under a *practical mode of presentation* (PMP for short, Stanley & Williamson, 2001, 429). The importance of PMPs is best illustrated by example: the first time that Eric taught me how to play a single paradiddle, he played it for me. Right then and there, I learned, of some way  $w$  of playing a single paradiddle, that  $w$  was a way that I myself [one] could [should] play a single paradiddle. That is, I learned the proposition that figures in the complement clause of knowing-how ascriptions, according to Stanley & Williamson. Intuitively though, I did not yet know how to play a single paradiddle. What was lacking? According to these authors, it is not enough for me to know the relevant proposition in just *any* way. An agent must come to know that proposition under a PMP, that is, by performing the relevant action. Thus, when Eric showed me how to play a single paradiddle, I became acquainted with the relevant proposition under a merely *demonstrative* mode of presentation. To come to know how to play a single paradiddle, I needed to become acquainted with that proposition under a PMP, that is, by learning to play the rudiment myself.

PMPs will be relevant for my argument. But before that, consider the following, *intellectualist* version of SAC, SAC-I:

1. I don't know that I am not a handless brain in a vat.
2. For some way  $w$  of playing a single paradiddle: the proposition that  $w$  is a way that I myself [one] could [should] play a single paradiddle logically entails the proposition that I am not a handless brain in a vat.
3. For some way  $w$  of playing a single paradiddle: if I know that  $w$  is a way that I myself [one] could [should] play a single paradiddle, then I know that I am not a handless brain in a vat.
- ∴ For some way  $w$  of playing a single paradiddle: I don't know that  $w$  is a way that I myself [one] could [should] play a single paradiddle.

Formally, SAC-I is as tight as any other instance of SAC. However, there is room to resist premise 2. That premise says that the following intellectualist's proposition entails that I am not a handless brain in a vat:

(IP)  *$w$  is a way that I myself [one] could [should] play a single paradiddle* (for some way  $w$  of playing a single paradiddle)

Contraposing, the brain-in-a-vat scenario makes (IP) false. But that is far from obvious. To the contrary, I want to argue that (IP) would remain true in the brain-in-a-vat scenario. The reason is two-fold: First, contrary to my ambiguous formulation above, the modal in (IP) is 'should' rather than 'could'. That is, (IP) is not ambiguous, at least with respect to its modality. Instead of an ability, (IP) ascribes a specific kind of obligation. In particular, I will argue that (IP) should be interpreted as a *teleological* proposition, that is, a proposition about *what ought to be done, in order to achieve a certain goal*. Secondly, (IP) states a necessary truth, in virtue of the fact that to play a single paradiddle is, essentially, to act in way  $w$ . Thus, (IP) would remain true in skeptical scenarios.

To see this, we need to dive into the semantics of (IP). First, as Stanley and Williamson (2001, 425) observed, the modal in (IP) seems to have an *ability* and *some kind of deontic* reading.<sup>6</sup> That is, (IP) can be read as saying that *w* is how I myself [one] *could* play a single paradiddle, or that *w* is how I myself [one] *should* play a single paradiddle—according to some norms, laws, or goals.

Whether the modal in (IP) is ‘should’ or ‘could’ is crucial to my argument, for the following reason: Being a brain in a vat would clearly impact my abilities, but less so my permissions and obligations. In other words: If I were a brain in a vat, then I would not be *able* to play a single paradiddle in way *w*. But it may still be the case that I *should* play a single paradiddle in way *w*.

Now, even though I presented the intellectualist’s analysis of ‘I know how to play a single paradiddle’ as ambiguous between the ability and (broadly) deontic reading, it can be shown that the latter reading is really at play, at least in this example. Bhatt (2008, 125 and ff) observes this by introducing an adverb modifying the interrogative item ‘how’:

(1) I know how loudly to play a single paradiddle.

(1) ascribes knowledge of how loudly I *should* play a single paradiddle, not of how loudly I am *able* to play it. To see this, consider the following scenario: Suppose I am the drummer, and I have to play a rather quiet single paradiddle during a given section of a song. If I played it as loud as I could, we would hesitate to say that I *knew how loudly to play the single paradiddle* in that particular section. Under the ability reading however, that sentence is predicted to be true. Introducing an adverb such as ‘loudly’ modifying the interrogative element ‘how’ shows that the modal inside the infinitival complement ‘how to play a single paradiddle’ was ‘should’ all along.<sup>7</sup>

Thus, the modal in (IP) is ‘should’. And therefore, skeptical scenarios would not immediately affect its truth in the way that they would, if it were an ability modal.<sup>8</sup>

We’re not out of the woods yet however, since it is not completely obvious either that skeptical scenarios would leave the relevant *shoulds* untouched. We may consider a skeptical scenario in which I am a handless brain-in-a-vat and, in addition, *w* is not a way that I myself, or anyone, should play a single paradiddle. Why? There could be many reasons. Perhaps *w* is also a way of invoking the devil; or perhaps in the real world it is absolutely forbidden to play drum rudiments. Any of those scenarios might arguably entail that (IP) is false.

<sup>6</sup>Most often, teleological and deontic modals are presented as distinct categories of modals (see e.g., Kratzer, 2012, p.37; Von Stechow & Gillies, 2007, p.34). Stanley and Williamson (2001, p.423) appear to use ‘deontic’ with a more general meaning, that is, related to permissions and obligations, which could include teleological modals. I am following their use of ‘deontic’ here.

<sup>7</sup>Objection: Even if (1) clearly invokes a ‘should’, couldn’t one say that (1) *minus* ‘loudly’ is ambiguous between ‘should’ and ‘could’? Yes, but such a view would beg the following question: How does introducing the modifier ‘loudly’ rule out the ‘could’-reading? It is arguably harder to answer that than to assume that the ‘should’-reading was the only reading from the start.

<sup>8</sup>At this point, someone might complain that *ought implies can* (OIC), and thus that the broadly deontic reading of (IP) entails the ability reading anyway. However, OIC has been called into question (Buckwalter & Turri 2015; Henne et al., 2016). Moreover, the kind of modal that is most clearly subject to OIC is moral. But as I argue below, the type of *ought* involved in knowing-how ascriptions is teleological.

Indeed, those scenarios are possible, but I want to resist that they would entail the falsity of (IP). The reason lies in the kind of *should* in (IP). As noted above, these modals make reference to contextually salient norms, laws, or goals. What are those in this case? Plausibly, the type of modal involved here is *teleological*. Teleological modals describe permissions and obligations relative to specific *goals*. Teleological modals are exemplified by sentences such as ‘to go to Harlem, you have to take the A train’, or ‘to become mayor, you ought to go to the pub regularly’.<sup>9</sup> In the case of knowing-how ascriptions, the relevant goal is a successful performance. In our running example, the goal would be to play a single paradiddle successfully. Thus, under this interpretation (IP) can be paraphrased as the following, teleological proposition:

(IP-T) *wis a—indeed, the*<sup>10</sup>*—way that I myself [one] should act, in order to play a single paradiddle successfully* (for some way *w* of playing a single paradiddle).

To show that (IP-T) is immune to skeptical considerations, we need to say something more precise about the semantics of teleological modals. Let us turn to the most standard account of teleological modals, which is Kratzer’s (1991, 2012). Kratzer offers a pretty good idea of what any theory of teleological modals would have to handle. I will aim to show that on Kratzer’s, or any sufficiently similar treatment, the intellectualist complements of at least some know-how ascriptions arguably evade SAC-I.

According to Kratzer, modals are quantifiers over sets of possible worlds, which are determined by two functions: a *modal base*—determining a set of accessible worlds (a domain of quantification, often called the *modal background*), and an *ordering source*, which ranks the worlds in the modal background. Different flavors of modality are distinguished by characterizing the modal base and the ordering source in different ways. In the case of teleological modals, the modal base is *circumstantial*, preserving relevant facts about the world, and the ordering source is determined by (i) a main goal (which may be stated explicitly or provided by context), together with (ii) other, ancillary goals of the modal’s syntactic subject.

As with other modals, teleological modals can have different forces: strong necessity (*have to*), weak necessity (*ought to* / *should*), and possibility (*can*). The difference between them is cashed out in terms of (restrictedly) universal and existential quantification. Truth conditions for a weak necessity teleological modal ‘ought’ relative to a modal base *f*, an ordering source *g*, and a means  $\varphi$  to a goal  $\psi$  would be as follows (von Fintel & Iatridou, 2005, 15):

<sup>9</sup>Teleological modals have been discussed under a particular syntactic form: so-called *anankastic conditionals* which are sentences of the form ‘if you want to go to Harlem, you have to take the A train’. Anankastic conditionals are host to a number of puzzles that are orthogonal to our present concerns. See Von Fintel and Iatridou (2005, 2008), Condoravdi and Lauer (2016), Phillips-Brown (2019).

<sup>10</sup>Recall that *w* was characterized as playing the pattern RLRLRLLL... More specifically, and given our set-theoretical characterization of ways, we should say that *w* is the set of maximally specific ways of playing the pattern RLRLRLLL... So indeed, playing that pattern is *the only* way in which one should play a single paradiddle. In addition, I am setting aside the fact that, as I said at the beginning, one can play multiple variations of the single paradiddle by starting at different points of the pattern, e.g.: LRLRLLLR..., RRLRLLLR..., etc. All those variations are intended as specifications contained in *w*.

(2) ‘To  $\psi$ , ought  $\varphi$ ’ is true iff all  $\psi$ -worlds among the  $g$ -best worlds in  $f$  are  $\varphi$ -worlds

That is, ‘ought’ universally quantifies over a restricted set of worlds in the modal background: those which satisfy the main goal  $\psi$  in addition to other, ancillary goals in the ordering source  $g$  (the  $g$ -best worlds). In a sentence such as ‘to become mayor, you ought to go to the pub regularly’, the weak necessity modal ‘ought’ takes a circumstantial modal base  $f$ , which preserves relevant facts (e.g., about town politics), and the main goal of becoming mayor as its ordering source  $g$ , together with other, ancillary goals (e.g., being well-liked by the townspeople). That sentence is true just in case all  $g$ -best worlds in the modal background determined by  $f$  where the addressee becomes mayor are worlds where they go to the pub regularly.

Similarly, (IP-T) contains a weak necessity modal, which takes a circumstantial modal base  $f$  with the main goal of playing a single paradiddle and other, ancillary goals as its ordering source  $g$ . (IP-T) is true just in case all  $g$ -best worlds in the modal background determined by  $f$  where the subject (either the knower or an indeterminate “one”) performs a single paradiddle are worlds where they act in way  $w$ .

Now, recall that way  $w$  of playing a single paradiddle consists in playing the pattern RLRRLRLL... Thus, *all and any* possible worlds where *anyone* succeeds in performing a single paradiddle are worlds where they act in way  $w$ . That is, (IP-T) states a necessary truth. We can see this by noting that a possible world where (IP-T) were false would host a contradiction. For a possible world to be such that  $w$  is not how I—or anyone—should act (in order to play a single paradiddle successfully), it would have to be the case that playing the single paradiddle does not involve playing the pattern RLRRLRLL... But that would be contradictory, since the single paradiddle *just is* the pattern RLRRLRLL... Thus, there is no such possible world.<sup>11</sup>

*A fortiori*, skeptical scenarios are not such worlds either. But it is worth pausing for a moment to consider what would happen at such scenarios. Suppose I am a brain in a vat a world  $v$ . One, initially natural, thought is to assume that the circumstantial modal base at  $v$ ,  $f(v)$ , would be such that all worlds in its range are worlds in which I am a brain in a vat. After all, a circumstantial modal is expected to preserve certain basic truths about the world of evaluation. This may include my envatted condition. If  $f(v)$  were like this, then  $f(v)$  would not include worlds in which I succeed in performing a single paradiddle (because I could not). (IP-T) requires that all  $g$ -best worlds in  $f(v)$  in which I perform a single paradiddle are such that I act in way  $w$ . Since there are no such worlds in  $f(v)$ , (IP-T) would be vacuously true at  $v$ .

<sup>11</sup>For a more bizarre, yet familiar, example: consider the household thought that the statement ‘water is  $H_2O$ ’ is a necessary truth (Putnam, 1973). Combined with the intellectualist semantics for knowing-how ascriptions laid out above (under its teleological reading), this delivers the result that the complement clause of ‘I know how to make water’ is a necessary proposition. That would be the proposition *that wis the way that I myself—or anyone—ought to act (in order to make water successfully)* (for some way  $w$  of making water). Suppose that  $w$  consists in binding two atoms of hydrogen and one atom of oxygen. Since water *just is*  $H_2O$ ,  $w$  is indeed the only way of making water. Thus, all possible worlds at which I succeed in making water are worlds in which I act in way  $w$ . My argument is that a knowing-how ascription such as ‘I know how to play a single paradiddle’ is structurally similar, in virtue of the fact that to play a single paradiddle *just is* to play the pattern RLRRLRLL...



However, if  $f(v)$  were like this, we would incur into various problems.<sup>12</sup> First, just like (IP-T), other propositions would be vacuously true at  $v$ . But that would be a bad prediction. For example, consider the following proposition:

(IP-T\*) *Playing RLRLRLRL... is a way that I myself [one] should act, to play a single paradiddle.*

RLRLRLRL... is *not* a way of playing a single paradiddle, and so (IP-T\*) should be false. But just like (IP-T), (IP-T\*) is vacuously true at  $v$ , under the assumption that all worlds in the modal background determined by  $f(v)$  are worlds in which I am envatted and therefore cannot play any drum pattern.

The second problem is that, if all worlds in  $f(v)$  are worlds in which I am envatted, then (IP-T) would violate the so-called DIVERSITY CONSTRAINT on modals (Carr, 2014; Frank, 1997; Zvolenszky, 2002). Very roughly, the diversity constraint says that any modal sentence  $M(\varphi)$  (where  $M$  is a modal and  $\varphi$  is its complement clause, or *prejacent*) should be evaluated at a modal background that includes both  $\varphi$ - and non- $\varphi$ -worlds.<sup>13</sup> If we are evaluating (IP-T), whose prejacent is the proposition *that I myself [one] act in way  $w$*  (for some way  $w$  of playing a single paradiddle), the diversity constraint demands that the modal background for (IP-T) includes worlds in which the subject acts in way  $w$  and worlds in which they don't. But if all worlds in the modal background are worlds in which I am envatted, then there are no worlds in  $f(v)$  where I act in way  $w$ , and the diversity constraint is not met.

More prominently for my argument, assuming the diversity constraint, this would imply that, if (IP-T) is true at any world  $u$ , then  $u$  cannot be a world where I am a brain in a vat. Thus, it would seem that (IP-T) does entail that I am not a brain in a vat after all. That is, premise 2 in SAC-I would be true, and its conclusion would follow: not knowing that one is not envatted precludes knowing how to play a single paradiddle.

This line of thought is a severe threat to my argument that know-how withstands SAC, even under intellectualism. But a key premise in it can be resisted, namely the initial assumption that the modal base  $f(v)$  determined by a world  $v$  in which I am envatted includes only worlds where I am envatted as well. There are good reasons to question that assumption. The thought behind a circumstantial modal is that it preserves certain truths that are, in a sense, backgrounded by speakers. A brain in a vat doesn't know that they are a brain in a vat, and so it makes good sense to think that *that* truth about  $v$  does not carry over to  $f(v)$ . One might argue that the relevant features of the circumstances that determine the modal background for a brain in a vat

<sup>12</sup> I thank an anonymous reviewer for this journal for suggesting this interesting problem and also for pointing to its solution.

<sup>13</sup> The main purpose of the constraint is to avoid the trivial truth of constructions like 'if  $p$ , then ought  $p$ ' (e.g., 'if teenagers drink, then teenagers ought to drink', Zvolenszky, 2002). These constructions come out trivially true because (i) the antecedent of a conditional updates the modal background and (ii) the modal in the consequent quantifies over the updated modal background. Thus, anything that gets plugged in the antecedent of a conditional will be true throughout the updated modal background. The constraint has been described as a presupposition, but there is a variety of alternative ways of cashing it out (see Carr, 2014 for discussion).



are aspects of the simulation that would be shared with real-life, and thus the modal background at worlds where one is a brain in a vat would still include worlds where one isn't. If this is so, then being in a brain in a vat would not be incompatible with (IP-T), even adopting the diversity constraint.

In addition, under the assumption that  $f(v)$  includes non-envatted-worlds, neither (IP-T) nor (IP-T\*) would be vacuously true at  $v$ . (IP-T) would be true, because all  $g$ -best worlds in  $f(v)$  where I play a single paradiddle are worlds in which I act in way  $w$  (namely, by playing RLRRLRL... ). By contrast, (IP-T\*) would be false, since it would not be the case all  $g$ -best worlds in  $f(v)$  where I play a single paradiddle are worlds in which I play RLRLRLRL.... Because *no* world is such that I play a single paradiddle by playing RLRLRLRL.... These are both welcome predictions.

The bottomline is that (IP-T) states a weak, means-end obligation. And crucially for my argument, (IP-T) would not be falsified by skeptical scenarios. Even if I were a handless brain in a vat unable to play a single paradiddle in way  $w$ , it would still remain the case that  $w$  is how I—or anyone—ought to act (in order to play a single paradiddle successfully). Thus, even if Stanley & Williamson's intellectualism about knowing-how is correct, SAC-I would not stick, since its second premise would not be true.<sup>14</sup>

Before moving on, it bears stressing that my reply to this potential intellectualist objection is not particularly married to our running example of playing a drum rudiment. Other basic actions suggest similar considerations. Take, for example, knowing how to high-five. If the foregoing considerations are correct, knowing how to high-five amounts to knowing that one ought to act in way  $w$ , in order to high-five (where  $w$  is a way of high-fiving). Now, if I were a brain in a vat duped into thinking that I have hands, I certainly could not high-five. But that is compatible with my knowing that  $w$  is how I ought to act, in order to high-five. So my knowledge of how to high-five would survive even if I were a brain in a vat.

There are two possible rebuttals to **Objection 1**. I consider each in turn.

### 2.1.1 Rebuttal 1: contingent know how

I have argued that the complements of knowing-how ascriptions, under the intellectualist's analysis, are necessary propositions. However, many knowing-how ascriptions are ascriptions of intuitively contingent knowledge, that is, knowledge that is tied to facts about the actual world. Such knowledge could easily be false in skeptical scenarios. For example, suppose that playing the pattern RLRRLRL... is the only way of making Eric happy. Thus, in virtue of knowing-how to play a single para-

<sup>14</sup> A weaker version of the thesis defended by Stanley and Williamson (2001) is to claim, not that knowing-how ascriptions are covertly knowing-that ascriptions, but that the former entail the latter. That is, that all knowledge-how entails some knowledge-that, perhaps in virtue of all knowing-how being at least partially *grounded* on knowing-that (Bengson & Moffett, 2011). SAC would latch onto any of the knowledge-that that is entailed by the target knowing-how ascription. E.g., suppose that knowing-how to play a single paradiddle entails knowing (IP). It could be argued that SAC targets (IP), and once such knowledge is destroyed, knowing-how would fall as well by *modus tollens*. This is formally a different objection to the one discussed in this section, but the same considerations apply against it: it is not obvious that (IP) would be falsified at skeptical scenarios.

diddle (and knowing that playing it makes Eric happy), I also know how to make Eric happy. But of course, I might be a brain in a vat duped into thinking that Eric has feelings where in reality he is just an apathetic character in the simulation. If so, then I don't actually know how to make Eric happy. This suggests that at least some knowing-how is prey to the skeptical whirlwind. In turn, this implies that my claim that knowing-how ascriptions withstand SAC-based arguments has to be qualified.

This objection is fundamentally correct, but it bears spelling out the difference, among knowing-how ascriptions, between those that withstand SAC and those that do not. This requires making a distinction between essential and non-essential ways of acting. As we saw above, playing the pattern RLRLRLRL... is *essentially* a way of playing a single paradiddle, since the single paradiddle just is that pattern and could not have been played any other way. By contrast, playing the pattern RLRLRLRL... is *non-essentially* a way of making Eric happy, since Eric could have had a different psychology.

It follows that, whereas (IP) is a necessary truth, the complement clause of *I know how to make Eric happy* (according to intellectualists) is not. Call such proposition (IP-H):

(IP-H) *w is the way that I myself [one] should act (in order to make Eric happy) (for some way w of making Eric happy).*

Following Kratzerian semantics for teleological modals, that sentence is true (relative to modal base *f* and ordering source *g*) iff all *g*-best worlds in the modal background determined by *f* where the speaker meets their goal of making Eric happy are worlds where they act in way *w*. Plausibly, the modal background at a normal world preserves relevant facts about Eric's psychology, and so (IP-H) comes out true relative to such a modal background.

But it's easy to countenance worlds at which such facts would not hold. Suppose that I am a brain in a vat duped into thinking that the only way to make Eric happy is to play a single paradiddle, whereas in reality the only way to make him happy is to play the harder, *double* paradiddle (RLRLRLRLRLRL...). Assuming that the modal background preserves facts about Eric's psychology, (IP-H) would not be true in this skeptical scenario. For *no* worlds in the modal background where I achieve the goal of making Eric happy would be such that this is achieved in way *w* (by playing RLRLRLRL...). Thus, (IP-H) is a contingent truth which can be false at skeptical scenarios.

The broader consequence of this is that, under intellectualism, some knowing-how ascriptions would be immune to skeptical considerations and some would not. Let us call the former *essential* know-how, and the latter *contingent* know-how. Specifically, if I were a brain in a vat, I may retain knowledge of how to play a single paradiddle—which is essential know-how, but not of how to make Eric happy. It may seem that this reduces greatly the scope of my argument. But note that the kind of knowledge-how that would survive SAC is knowledge of very simple and basic actions. Playing drum rudiments or other musical phrases, tying knots, or swimming specific strokes are all examples of such basic actions. If intellectualists are right, knowing how to perform these actions involves acquiring knowledge of necessary

truths, which would not be falsified at skeptical scenarios. Thus, even under intellectualism, all this know-how would be immune to SAC.

### 2.1.2 Rebuttal 2: PMPs for envatted beings

The second rebuttal involves PMPs. Recall that, for an agent to be ascribed know how, it is not enough for them to know the relevant proposition in just *any* way; they need to know the relevant proposition under a PMP, that is, by performing the action themselves. But if I am a brain in a vat, then I cannot perform any action. Consequently, I cannot become acquainted with any proposition under a PMP, and therefore, I cannot know how to play a single paradiddle.

There are various ways to respond to that rebuttal, but they all revolve around the idea that the nature of PMPs and their role in the intellectualist's analysis have never been made completely clear (see e.g., Schiffer, 2002; Glick, 2015; Noe, 2005). However, let us assume that PMPs do play a role in the meaning of knowing-how ascriptions. What role is that? Stanley and Williamson remained neutral regarding whether PMPs belong to the *semantics* or the *pragmatics* of knowing-how ascriptions (2001, 428). Importantly, each choice has different consequences for my argument.

Consider the pragmatic view first. According to it, a knowing-how ascription would ascribe knowledge of a proposition that does not include a PMP as part of its content. Rather, acquaintance under a PMP would play a pragmatic function, perhaps affecting the *assertion* conditions of knowing-how ascriptions (instead of their truth conditions). To see this view at work, consider a subject *s* who knows how to  $\varphi$  under a non-PMP. Under this pragmatic construal, although it may be *true* that *s* knows how to  $\varphi$ , we may hesitate to *assert* so, perhaps due to the know-how construction carrying a pragmatic inference that *s* knows this under a PMP.<sup>15</sup> Brains-in-vats would arguably fall under this class. So, it would be true that brains-in-vats can know how to play a single paradiddle—undercutting SAC, even though we would hesitate to say so.

According to the semantic view by contrast, a knowing-how ascription would ascribe knowledge of a proposition that includes a PMP as part of its content (Pavese, 2015). Under this semantic construal, one may argue that brains-in-vats cannot know such propositions, for they lack the appropriate contact with their surroundings. However, it is not obvious that a brain-in-a-vat cannot entertain propositions under PMPs. True, its interactions with their environment are a simulation. But acquaintance under PMPs may not require interactions with an *actual* environment; one may argue that possessing the relevant states of mind would be enough. For example, one may cash out PMPs in terms of practical dispositions (dispositions to act in certain ways under specific circumstances), which for brains-in-vats would only ever manifest *in the simulation*. There is no apparent reason why envatted beings could not have such states, just like they have beliefs and desires.

In sum, the view that being a brain in a vat prevents one from entertaining propositions under PMPs, and thus from possessing know-how, requires substantive argu-

<sup>15</sup>For comparison, suppose that Mary ate all the cookies. In that situation, it would be true that Mary ate some cookies, but we would hesitate to assert so (due to 'some' pragmatically implying 'not all').

ment. I move now to a second objection to my claim that knowing-how withstands SAC.

## 2.2 Second objection: closure for *how-to* questions

In section 1, I argued that SAC cannot get off the ground because knowing-how ascriptions do not ascribe knowledge of propositions, and since **Closure** takes propositions as arguments, it is toothless here. This suggests that, besides quibbling about intellectualism, an alternative way to object to my argument would be to substitute **Closure** for a different principle, linking *how-to* questions to propositions (instead of propositions to propositions). The needed principle should be such that, if the appropriate relation between a *how-to* question and a proposition obtains, then the required entailment will also hold across the relevant knowledge ascriptions. We could consider the following, interrogative-friendly variant of **Closure** (where *H* is a *how-to* question):

**Closure\***. If *H* entails *p*, then if *S* knows *H*, *S* knows that *p*.

At first sight however, this might seem unhelpful. The classical notion of entailment is a relation between propositions, so **Closure\*** would appear meaningless. But that is not the case: in *inquisitive semantics* (Ciardelli et al., 2019), the notion of entailment is generalized to apply across propositions and questions. Briefly: for any sentences  $\varphi, \psi$  (which may be declarative or interrogative),  $\varphi$  entails  $\psi$  just in case *establishing* $\varphi$  *establishes*  $\psi$ , where to establish a proposition is to establish whether it is true or false, and to establish a question is to answer it.

In particular, an interrogative sentence entails a declarative sentence iff establishing an answer to the former establishes the truth of the latter. The clearest case in which this relation holds is the case of presupposition. Whenever a question carries a certain presupposition, answering that question *eo ipso* establishes the truth of its presupposition. In this sense for example, the question *where are Mary's keys?* entails the proposition *that Mary has keys*, in virtue of the fact that establishing an answer to that question establishes the truth of that proposition (Ciardelli, 2016, 6–8).

Moving to *how-to* questions, we would say that a question *H* entails a proposition *p* just in case answering *H* establishes the truth of *p*. Thus, a *Skeptical Argument based on Closure\** (SAC\*) could go as follows (where *p* is a preposterous possibility, e.g., *that I am a handless brain in a vat* and *H* is, e.g., *how to play a single paradiddle*):

1. I don't know that not-*p*. (premise)
  2. *H* entails not-*p*. (premise)
  3. If I know *H*, then I know that not-*p*. (2, **Closure\***)
- ∴ I don't know *H*. (1, 3, *modus tollens*)

Unfortunately however, adopting **Closure\*** is not enough to set off SAC\*. The problem lies in premise 2: the questions that we are concerned with (e.g., *how to play a single paradiddle*) and the preposterous skeptical hypotheses that SAC\* requires (e.g., *that I am a handless brain in a vat*) are logically independent in the inquisitive sense—establishing one does not establish the other. Presumably, any answer to the question of how to play a single paradiddle will involve a set of instructions such as those given at the beginning: perform the pattern RLRLRL... with a steady, uniform rhythm. Such answer in no way establishes the falsity of the proposition that

I am a handless brain in a vat. So even if we accepted a principle such as **Closure\***, SAC\* could not take off.<sup>16</sup>

Perhaps, however, we could find examples of *how-to* questions that are connected to certain propositions in the way required by premise 2 of SAC\*.<sup>17</sup> Consider knowing how to ride a bike. In the actual world, riding a bike requires certain conditions that are more or less stable across performances: the shape and mechanical makeup of bicycles, as well as the gravitational and physical environment of the Earth—call those the “normal conditions”. These are contingent facts and properties, which could fail to hold. What if *in reality* bikes, or physics, were very different? For example, suppose that gravity were stronger, to the point where riding a bicycle would be as difficult as riding, say, a unicycle. If so, what I believe riding a bike requires would be quite mistaken. If I can’t rule out such skeptical scenarios, it may turn out that I don’t know how to ride a bike.

It bears spelling out this argument carefully. We are looking for a true instance of premise 2 in SAC\*, which establishes a relation of entailment between a *how-to* question and a proposition. Now, one might argue that the question of how to ride a bike entails that the “normal conditions” hold, in virtue of the fact that establishing an answer to that question establishes the truth of the latter proposition (perhaps the proposition that the “normal conditions” hold is a presupposition of the question how to ride a bike, perhaps it’s something else). Suppose that is the case. Then, by **Closure\***, if you know how to ride a bike, you know that the “normal conditions” hold. But you don’t know that, so you don’t know how to ride a bike.

How damaging is this for my argument? I think that depends on the distribution of contingent and essential know-how (as described in Sect. 2.1.1), because true instances of premise 2 in SAC\* involve—as far as I can tell—contingent know-how only.

As we saw, some know-how is essential, in the sense that learning it involves learning necessary features of the relevant action. By contrast, some know-how is contingent, in the sense that learning it involves learning contingent features thereof. And it seems to be an intuitive property of contingent know-how that it entails contingent truths. Knowing how to make Eric happy arguably entails certain contingent truths (i.e., about Eric’s psychology), which as we saw might have easily been otherwise. Knowing how to ride a bike is arguably contingent too, and thereby entails contingent truths as well.

Essential know-how, on the other hand, seems different. When we learn a drum rudiment, or a knot, or to high-five, we learn certain abstract facts and relations, none of which seem to depend, in any crucial way, on contingent features of the world. What contingent truths are entailed (in the sense of **Closure\***) by the question of how

<sup>16</sup> Things would be different if we were considering a knowing-how ascription that carries a presupposition about the external world. E.g., the question *how to play a single paradiddle with my own hands* presupposes that *I have hands*, and so by **Closure\***, *knowing-how to play a single paradiddle with my own hands* would entail *knowing that I have hands*, and not knowing the latter would entail not knowing the former. However, our running example (‘I know how to play a single paradiddle’) does not carry such presupposition. It follows that skeptical considerations may kill my knowledge of how to play a single paradiddle *with my own hands*, but not my knowledge of how to play a single paradiddle *simpliciter*.

<sup>17</sup> I thank an anonymous reviewer for suggesting this criticism.

to play a single paradiddle? Not many. Recall that, when you learn how to play a single paradiddle, you learn the pattern RLRLRLRL.... Nothing else matters. And in particular, nothing matters that could fail to hold at the next possible world, such as the surface you're drumming on, the size of your drumsticks, the atmospheric conditions, etc. In this sense, learning a drum rudiment is different from learning to ride a bike. In sum, even though we may find sound instances of SAC\*, I suspect that they will all involve contingent know-how. Essential know-how, by contrast, still escapes SAC\*.

Alternatively, instead of searching for links between preposterous skeptical scenarios and *how-to* questions, one could formulate such preposterous scenarios as preposterous *how-to* questions. Such preposterous questions should be logically connected to our quotidian question of *how to play a single paradiddle*, so that failing to know the preposterous question entails failing to know the quotidian question. This version of an interrogative-friendly closure principle would be as follows (where  $H, H'$  are different *how-to* questions):

**Closure $\dagger$ .** If  $H$  entails  $H'$ , then if S knows  $H$ , S knows  $H'$ .

I see two ways of filling in the gaps in the service of a version of SAC based on **Closure $\dagger$** . The first is somewhat flat-footed: just reformulate your favorite preposterous hypothesis as a *how-to* question. E.g., instead of the preposterous proposition *that I am a handless brain in a vat*, consider the preposterous question *how (not) to be a handless brain in a vat*. But that will not help, because that preposterous question is no more entailed by the question *how to play a single paradiddle* than the previous preposterous proposition. That is, establishing an answer to the question *how to play a single paradiddle* does not establish an answer to the question *how (not) to be a handless brain in a vat*. So skeptical considerations might make me conclude that I don't know how not to be a brain in a vat (just like they make me conclude that I don't know that I am not a brain in a vat), but that does not entail that I don't know how to play a single paradiddle.

A second way of filling out **Closure $\dagger$**  would be to look at the actual entailments of our quotidian *how-to* question, and determine whether skeptical considerations destroy our knowledge of those. Consider, as a candidate for one such entailment, the question *how to do something* ( $H'$ ). The quotidian question *how to play a single paradiddle* ( $H$ ) clearly entails  $H'$ , because establishing an answer to  $H$  establishes an answer to  $H'$  (if *this* is how one plays a single paradiddle, *this* is how one does something). So  $H$  and  $H'$  stand in the right entailment relation. By **Closure $\dagger$** , if S knows  $H$ , then S knows  $H'$ . Thus, SAC $\dagger$  might go as follows:

1. I don't know  $H'$  (premise)
  2.  $H$  entails  $H'$  (premise)
  3. If I know  $H$ , then I know  $H'$  (2, **Closure**)
- $\therefore$  I don't know  $H$ . (1, 3, *modus tollens*)

However, SAC $\dagger$  is not enough either to conclude that S doesn't know how to play a single paradiddle. This time the problem is premise 1: *I don't know how to do something* (this would be equivalent to the premise, in SAC, that I don't know that I am not a handless brain in a vat). Premise 1 has not been established, so there is no reason

to adopt it as premise for this version of SAC. Thus, unless some reason is given to doubt that I know how to do something, **Closure**<sub>†</sub> cannot set off SAC<sub>†</sub>.<sup>18</sup>

### 2.3 Third objection: knowing-how as ability

It is intuitive to think that knowing-how ascriptions are logically equivalent to ability ascriptions (Fridland, 2015; Pavese, 2016; Ryle, 1949).<sup>19</sup> Ascriptions of abilities are propositional and do not contain embedded questions, so perhaps SAC goes through in this case. If it does, will we not have established skepticism about abilities, and *eo ipso* about knowing-how? No, this way at most we can establish skepticism about *the proposition that* I know how to play a single paradiddle, but not about my know-how itself.

Let's see why. Assume that knowing-how ascriptions are logically equivalent to ability ascriptions:

**KH**  $\approx$  **Ability**. S knows how to  $\varphi$  iff S can  $\varphi$ . (where this is an ability can)

We can easily establish skepticism about abilities ascription via SAC, as follows:

1. I don't know that I am not a handless brain in a vat.
  2. The proposition that I can play a single paradiddle logically entails the proposition that I am not a handless brain in a vat.
  3. If I know that I can play a single paradiddle, then I know that I am not a handless brain in a vat.
- $\therefore$  I don't know that I can play a single paradiddle.

Applying **KH**  $\approx$  **Ability** to the conclusion of the previous instantiation of SAC, we might expect to conclude that I don't know how to play a single paradiddle. But that is not what we obtain, which is:

$\therefore$  I don't know that I know how to play a single paradiddle

This version of SAC destroys my high-order propositional knowledge about my drumming abilities, but not my first-order knowing-how! Knowing-how survives although, admittedly, we are left in a kind of Pyrrhonian position: we cannot deny that we possess know-how, although we can never know whether or not we have achieved it. Whether this is a severe epistemic condition to be in is a further ques-

<sup>18</sup> Instead of  $H'$ , one may consider a putatively different entailment of  $H$ . For example, it could be argued that the question *how to play a single paradiddle* entails the question *how to play a single paradiddle with my own hands* (call the latter  $H''$ ). If so, skeptical considerations might be able to kill my knowledge of  $H''$  (by **Closure**<sub>\*</sub>, see n. 11), and by **Closure**<sub>†</sub>, my knowledge of  $H$ . However, it's not obvious that  $H$  entails  $H''$ . Suppose I learned to play drums with my feet only. I would know how to play a single paradiddle, but I would not know how to play it with my own hands (compare this with the much clearer entailment from  $H$  to  $H'$ ). Thus, the route to SAC<sub>†</sub> via  $H''$  is blocked. More generally, whereas I have been considering the "upward" (i.e., specific to general) entailments of *how-to* questions as a basis for SAC<sub>†</sub>, this is a suggestion to consider their "downward" entailments instead (i.e., general to specific). My point is that I don't think that embedding under *know* licenses the downward entailments of 'how-to'-questions.

<sup>19</sup> I ignore complications stemming from examples such as the salchow case (Bengson & Moffett, 2007, 46), where an agent might possess a reliable ability without the right know-how.



tion, but as we will see shortly, there is one salient reason not to worry, which is that knowing-how is not a luminous state.

### 2.3.1 Rebuttal: luminosity

Is this the end of this objection? Not yet. If knowing-how states were luminous, then high-order ignorance about knowing-how should kill first-order knowing-how. Luminosity for knowing-how can be stated as follows:

**Luminosity for KH.** For every case  $\alpha$ , if I know how to  $\varphi$  in  $\alpha$ , then in  $\alpha$  I know that I know how to  $\varphi$ .

From our previous conclusion that I don't know that I know how to play a single paradiddle, by **Luminosity for KH** and *modus tollens* we could reach the conclusion that

∴ I don't know how to play a single paradiddle.

However, the luminosity of knowing-how is doubtful. In fact, Williamson's arguments against the luminosity of other mental states (e.g., feeling cold) apply rather straightforwardly to knowing-how. Recall Williamson's argument against the luminosity of feeling cold—or rather, against the luminosity of (not) feeling warm.<sup>20</sup> A similar argument can be built with knowing-how ascriptions. Assume a succession of temporal instants one millisecond apart from the moment when Eric taught me the single paradiddle for the first time,  $\alpha_0$ , to the end of the hour-long class during which I practiced until I learnt the basics,  $\alpha_n$ . By hypothesis, at  $\alpha_0$  I didn't know how to play it (premise 1) but by  $\alpha_n$  I did (premise 2). Assuming that knowledge is safe across temporal instants<sup>21</sup> (premise 3) and that knowing-how is luminous (premise 4), we can conclude, by hypothetical syllogism, that if I lack knowing-how at  $\alpha_0$ , I lack knowing-how at a sufficiently immediate state  $\alpha_0 + 1$ . This way, we reach the conclusion that, at  $\alpha_n$  I still didn't know how to play a single paradiddle. Let us formulate the argument schematically as follows (where  $K$  is 'know' and  $H$  stands for the question 'how to play a single paradiddle'):

1. At  $\alpha_0 \sim KH$  (Premise)
2. (Premise)
3. If at  $\alpha_0 K \sim KH$ , then at  $\alpha_0 + 1 \sim KH$  (Safety)
4. If at  $\alpha_0 \sim KH$ , then at  $\alpha_0 K \sim KH$  (Luminosity for KH)

<sup>20</sup>I assume familiarity with Williamson's anti-luminosity argument (Williamson, 2000, p. 96 and ff). Williamson's prime example is of a state that is gradually lost (feeling cold). By contrast, whereas know-how is clearly gained gradually, one may dispute that it's always gradually lost—if I suddenly lost my motor abilities, it may be argued that I would suddenly lose all drumming know-how. For this reason, we'd better switch around Williamson's argument so that the parallelism with knowing-how is as clear as possible. Nothing hinges on this (though see Pavese, 2017 against the view that knowing-how is gradual).

<sup>21</sup>**Safety:** For any case  $\alpha$  & proposition  $p$ , if one knows that  $p$  at  $\alpha$ , then  $p$  is true at any state  $\alpha'$  that is sufficiently similar to  $\alpha$ . See Neta and Rohrbaugh (2004) for criticism, although I don't think that it applies straightforwardly to the case of knowing-how.

5. If at  $\alpha_0 \sim KH$ , then at  $\alpha_0 + 1 \sim KH$  (3, 4, Hypothetical syllogism)
6. At  $\alpha_0 + 1 \sim KH$  (1, 5, *modus ponens*)
- ...
- $\therefore$  At  $\alpha_n \sim KH$

But that conclusion is absurd, therefore knowing-how is not luminous. And if it isn't, establishing skepticism about ability ascription isn't sufficient to establish skepticism about knowing-how.

### 3 Conclusion

Some knowing-how ascriptions survive closure-based arguments for external world skepticism. In particular, ascriptions of knowing how to perform actions which are *essentially* characterized by the ways in which they are taught and learnt are untouched by skeptical considerations. However mundane such actions may be, learning them seems to amount to acquiring a kind of particularly robust knowledge, one which envatted beings can safely acquire and retain—in spite of their otherwise poor epistemic standing.

But then, what's the anti-skeptical payoff? What do we gain, or guard against, when we realize that basic knowledge-how ascriptions aren't endangered by brain-in-vats scenarios? This is a difficult question, but it bears rehearsing an answer. Knowing-how is a kind of knowledge that seems, in various respects, not unlike contingent, propositional knowledge about the external world. We learn it through our senses, and we come to possess it through drill and habit. Once we possess it, it shapes our decisions and actions. In other words, just like contingent, propositional knowledge, we seem to be able to acquire and maintain it only *en rapport* with our environment. Yet, in contrast to our knowledge of the external world, the apparent epistemic instability of our environment cannot prevent us from obtaining some—perhaps only a few—pieces of practical certitude. Thus, we see—though perhaps cannot yet attain—a way out of the skeptical whirlwind right through its very eye.

This being said, my claim is only negative: I have merely argued that SAC-based arguments are toothless as they are applied to some knowing-how ascriptions. Perhaps a further, positive argument can be constructed from knowing-how to knowledge of the external world, but that is beyond the purpose of this paper.

In sum: the skeptic can destroy my knowing that I have a drum in front of me and that I am holding a pair of drumsticks, but they cannot destroy my knowledge of how to play a single paradiddle. To wit, like Diogenes I can rise and play RLRRLRL....

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