

Know-How, Action, and Luck¹

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1. Introduction

A good surgeon knows how to perform a surgery; a good architect knows how to design a house. We value their know-how. We ordinarily look for it. What makes it so valuable?

A natural response is that know-how is valuable because it *explains* success. A surgeon's know-how explains her success at performing a surgery. And an architect's know-how explains his success at designing houses that stand up. We value know-how because of its special explanatory link to success. But in virtue of what is know-how explanatorily linked to success?

This essay defends the thesis that know-how's special link to success is to be explained at least in part in terms of its being, or involving, a doxastic attitude that is epistemically alike propositional knowledge.² If its explanatory link to success is what makes know-how valuable, an upshot of my argument is that the value of know-how is due, to a considerable extent, to its being, or involving, propositional knowledge.

The thesis that know-how is, or involves, a belief state epistemically alike propositional knowledge is, to put it mildly, unorthodox in epistemology. Intellectualists have argued that know-how is a kind of propositional knowledge. But their arguments are mostly based on considerations having to do with how know-how is ascribed in English (Stanley & Williamson 2001; Stanley 2011). And the particular intellectualist claim that know-how must be knowledge-involving rather than merely true belief-involving has been found wanting. The “epistemic difference” critics of intellectualism, as I will label them, have objected that there are substantial epistemic differences between know-how and knowledge and that those differences provide the

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² Although I also believe the claim that know-how is identical to a propositional knowledge state, in this essay I will only defend the weaker claim that know-how *requires*, or *involves*, a propositional knowledge state. Many people object to the sufficiency of propositional knowledge for know-how. (For more recent criticism, see Audi 2017 and Levy 2017). I agree with them that the sufficiency claim is implausible unless a clear and worked-out picture of *practical modes of presentation* is provided. Although in this essay I do not talk about practical modes of presentation, I have been developing a theory of practical modes of presentation in a series of papers (Pavese 2015b; Pavese 2017c; Pavese forthcoming; Pavese manuscript).

most persuasive argument for an anti-intellectualist view of know-how (Poston 2009; Carter & Pritchard 2015). “Revisionary intellectualists,” on the other hand, have suggested that such epistemic differences motivate a revisionary form of intellectualism — a form of intellectualism that identifies know-how with true belief that might fall short of knowledge (Cath 2011; 2015).

Most of this debate has relied on intuitions about cases. As I point out in §3, however, little progress can be made by entirely relying on intuitions about cases, for those do not unequivocally support either side of debate. In order to overcome this aporia, my argument will rest on theoretical considerations hinging on the role that know-how plays in satisfactory explanations of intentional success.³ Such theoretical considerations suggest that know-how is epistemically much more alike knowledge than the “epistemic difference” critics allege; and that a revisionary form of intellectualism of the sort suggested by Cath (2011; 2015) is not really a stable position.

In §2, I motivate the claim that knowing how to perform a task is belief-involving; moreover, I defend such a claim against a prominent challenge by Setiya (2012). That will set the stage for discussing the epistemic status of this belief, which is the real focus of this essay. In §3, I review the main arguments for the conclusion that know-how and knowledge come apart in their epistemic profile and discuss some reasons for doubting those arguments. In §4, I develop an argument for thinking that know-how must be subject to an anti-luck condition — an anti-luck condition that is plausibly the same knowledge is subject to. In §5, I discuss and defend an argument for the conclusion that whatever is needed in addition to true justified belief to get knowledge is also needed in addition to true justified belief to get know-how. In §6, I return to discussing how the main conclusions of this essay impact our understanding of the value of know-how.

2. Know-how and belief

As many authors have noticed (Ryle 1949; Mele & Moser 1984; Stanley & Williamson 2001; Bengson and Moffett 2011a, 2011b; Stanley 2011; Cath 2008, 2009, 2015; Pavese 2015a, 2015b,

³ Hawley (2004:19) also emphasizes the similarity between know-how and knowledge, when she says: “Just as propositional knowledge can be understood in terms of true belief plus warrant, knowledge-how can be understood in terms of successful action plus warrant.” There are important differences, however. Hawley (2004) leaves open that know-how and knowledge might be different kinds of states and that warrant applies to belief in one case and to action in the other. In contrast, my claim is the anti-luck condition is *the same* for both know-how and knowledge and that in both cases it is a condition on a *belief* state.

2016b, 2017a), know-how characteristically manifests through intentional actions. As Ryle (1949: 33) observes, the clumsy man's visible trippings and tumblings do not manifest know-how and that is so because they do not trip on purpose; the clown's know-how manifests not just through their trippings and tumblings — for those are things that the clumsy man could do too — but through their *intentionally* tripping and through their *intentionally* tumbling.

That is a first consideration for thinking that, if one knows how to ϕ , one must have the ability to intentionally ϕ — i.e., the ability to intentionally ϕ is entailed by knowing how to ϕ .

But is it? A ski instructor may know how to perform a certain complex stunt, without being able to perform it themselves; and that the master pianist who loses both of their arms in a tragic car accident still knows how to play the piano, even though they have lost their ability to do so (Ginet 1975; Stanley & Williamson 2001:416). In response, notice that although the ski instructor knows how *one* could perform the ski stunt, they do not know how to perform the ski stunt *themselves*. In other words, the ability to intentionally ϕ is only required of *de se* know-how — i.e., it is only required for one to know how to ϕ *oneself* (Pavese 2017b:A5–6). Moreover, the ability to intentionally ϕ comes apart from being *able* to intentionally ϕ (cfr. Hawley 2003; Noë 2005; Glick 2012; Pavese 2017a) and is to be understood not in terms of actual or circumstantial success but in terms of *counterfactual intentional success* (Hawley 2003:24): while it is true that the handless pianist is not *able* to intentionally play the piano, they *would* be able to play the piano in conditions that are favourable for their playing the piano, and those are ones where they are not handless. Hence, knowing how to ϕ requires the ability to intentionally ϕ *in this sense*.

On the other hand, it seems that, if one has the ability to intentionally ϕ , then one must know how to ϕ — that knowing how to ϕ is necessary for the ability to intentionally ϕ (cfr. Cath 2009, 2011, 2014:10; Bengson and Moffett 2011b: 177). This condition on intentional action can be motivated by cases such as Susie's, who believes that she can annoy Joe by smoking but in fact Joe is annoyed by Susie's tapping on her cigarette box, which she does whenever she smokes. Susie does have the ability to annoy Joe but does not have the ability to intentionally do it for she does not know how to annoy him (Hawley 2003: 27; Setiya 2011: 297). We are thus led to *Know-how/Intentionality* — a principle widely endorsed in the literature on know-how, by both sides of the intellectualism/anti-intellectualism debate (Ryle 1949; Setiya 2012; Hawley 2003; Gibbons 2001; Pavese 2015a: 174; 2015b: 17; 2016a, b; 2017a):

Know-how/Intentionality: S knows how to ϕ just in case S has the ability to intentionally ϕ .

Some even propose *Know-how/Intentionality* as a *theory* of know-how. For example, according to Setiya (2012), knowing how to ϕ is *nothing but* the ability to intentionally ϕ .

But what does the ability to intentionally perform an action itself amount to? A pressing concern about the sort of theory of know-how proposed by Setiya (2012) is that such an ability is itself something that requires an explanation in terms of something more basic. The intentionality aspect of the ability in particular cries out for an explanation. It does not seem like something we should take as unexplained starting point (Pavese 2015a: 187, fn. 26).

What does the ability to intentionally ϕ reduce to? Here is an argument for thinking that it reduces to a *doxastic attitude*. The first premise is that intentionally performing ϕ requires a true belief about how to ϕ . If so, then plausibly *being in position to* intentionally perform ϕ requires a true belief about how to ϕ . But if *being in position to* intentionally perform ϕ requires a true belief about how to ϕ , one might be tempted to think that also the ability to intentionally ϕ must require a true belief about how to ϕ . (I will consider objections momentarily.) Now, suppose that is correct. If the ability to intentionally perform an action did require a true belief, then given *Know-how/intentionality*, we would expect there to be a similar belief requirement on know-how too. Else, we would have to suppose that intentional action is rooted both in a belief state and in a distinct state of know-how. This view is not only non-parsimonious and unmotivated. It also raises the issue of explaining how the subject's know-how and the subject's belief state interface. A belief requirement on know-how entirely bypasses these issues.

The first premise of my argument is that intentionally ϕ -ing requires a belief about how to ϕ . This claim is widely endorsed by action theorists (Goldman 1970; Audi 1973, 1986; Brand 1984; Harman 1976; Thalberg 1984; Ginet 1990; Mele 1992; Mele & More 1994). For example, Goldman (1970:61) declares it to be a requirement of intentional actions that they be “caused by action plans” — so that one intentionally and successfully ϕ s only if one has a complete “action-plan” about how to ϕ , where an action-plan includes a set of beliefs about the means to be taken in order to ϕ , such that, roughly, for a list of basic acts ψ_1, \dots, ψ_n , one believes that one would or might ϕ by ψ_1 -ing, \dots , ψ_n -ing. In this literature, being guided by a belief about how to ϕ in executing how to ϕ is taken to be an antidote to the success being too lucky and fortuitous — the idea being that, say, the gunman intending to bring about the man's death cannot succeed at

doing it intentionally unless they do it according to a plan, for else their action would be too fortuitous to count as intentional.⁴

Indeed, the thesis that beliefs play a central role in explaining intentional behavior is quite standard in philosophical psychology (Lewis 1974; Dennett 1981; Stalnaker 1984; Dretske 1988; Gibbons 2001). Why think, though, that the relevant belief must be true? As Gibbons (2001:585) points out (see also Greco D. 2016: 190), we appeal to belief in order to explain attempts as well as intentional successes. On the other hand, an explanation of intentional successes, and not of merely attempts, requires the truth of the subject's belief. For example, Alice's success at intentionally stopping the car cannot simply be explained by her belief that she can stop the car by pressing the pedal, independently of its truth. If her belief had been false, she would have most likely failed at stopping the car.⁵ Because we are looking for necessary conditions on *intentional success*, and not merely on *intending to perform an action* or *attempting to perform it*, we cannot be content with a belief requirement that does not include the truth of the belief.

As a further illustrating example, consider again the case of Susie, who does not intentionally annoy her friend, for she lacks a *true* belief about how to annoy him. Only *true* belief requirement can handle this case: for Susie does have false beliefs about how to annoy her friend and does not intentionally annoy him.

Hence, an explanation of the ability to intentionally succeed requires not just a belief but a *true* belief about how to do it. Are not there obvious objections to the claim that intentional action requires a true belief? Suppose someone holds a gun to Bill's head and tells him to sink the basket. As he does so, he thinks there is no chance that he will succeed. Amazingly, he is mistaken: he manages to sink every shot. However, his performance is in some sense intentional (cfr. Peacocke 1985: 69). In response, we can capture the sense in which his performance is intentional without conceding that Bill intentionally succeeds at sinking the basket, by observing

⁴Note that my claim that intentionally ϕ requires a belief about how to ϕ is independent of the claim that intentions themselves are beliefs. (See criticisms of this claim in Holton 1999 and Thompson 2008. See a recent defense of this claim in Marusic & Schwenkler forthcoming). Intentions might not be beliefs and yet might require beliefs in order for the action that they cause to be intentional. Goldman (1970) himself does not present his view as a theory of intentions but rather as an analysis of *intentional action*. The same consideration also makes my proposal immune to Hornsby's (2016) criticism against intellectualism about know-how — criticism that relies on equating propositionalist treatments of know-how and propositionalist treatments of *intentions*.

⁵ Even if one thinks that "psychological" explanations must only be restricted to trying or attempts (Alston 1974:95; Stich 1984), one might grant that intentional successes are also susceptible of an explanation, though one that will not be purely psychological.

that there is certainly something, in fact possibly many things, that Bill does intentionally when he sinks the basket. For example, he throws the ball thus and so, aims in a certain direction, moves his feet in a certain way, etc. We intuit that his performance is intentional because it is indeed “generated” by many acts that are intentional.⁶ But it does not follow *from that* that Bill’s *successfully sinking the basket* itself is intentional.

Thus, despite some *prima facie* challenges, a true belief requirement on intentional success is quite plausible. And it is independently motivated by prominent theories of action. But now, if there is a true belief requirement on intentional success, then it seems to follow that one could not be in position to successfully perform an intentional action unless one had a true belief about how to perform it. Plausibly, moreover, the ability to intentionally perform an action is nothing but a matter of being in position to succeed at performing it when one tries to perform it. That seems to suggest that, in *many cases* at least, the ability to intentionally perform an action will require a true belief about how to perform it.

What kind of true belief is plausibly required for one to intentionally succeed at ϕ -ing? Not the belief that, for some way ψ of ϕ -ing, one *will* ϕ by ψ -ing: that is presumably too strong, for one might intentionally ϕ even though one has some doubts about whether one will succeed (Goldman 1970; Harman 1976). Should the relevant belief be that, for some way ψ of ϕ -ing, one would in most cases succeed at ϕ -ing by ψ -ing? This is also too strong: one might intentionally ϕ even though one might fail in most circumstances, as the baseball player who fails at batting 19 times out of 20 may nonetheless intentionally bat the one time they succeed. That suggests that the relevant belief is that, for some way ψ of ϕ -ing, one is *sufficiently likely* to ϕ by ψ -ing, where what counts as sufficiently likely may vary from task to task:⁷

(Intentionality/Belief) If one successfully intentionally ϕ s at t , then at t one believes, for some way ψ of ϕ -ing, that one is sufficiently likely to ϕ by ψ -ing.⁸

⁶ In Goldman’s (1970) sense of “generation.”

⁷ On this view, were one not to believe that one is sufficiently likely to ϕ by ψ -ing, for some way ψ , one could only try to ϕ but not intentionally succeed at ϕ -ing.

⁸ *Intentionality/belief* is compatible with subintentional actions being possible, which are not guided by belief states (Cfr. Burge 2010). So it is compatible with there being agents that are only capable of less than intentional actions which are in turn guided by a non-doxastic state. *Intentionality/belief* is not compatible with the idea that intentional action, whether in humans or in non-human animals that are capable of intentional action, is guided by a non-doxastic state (*pace* Nanay 2013). Similarly, the following *Belief requirement on know-how* is compatible with sub-intentional actions being guided by a state, different from human know-how, that does not require belief. We might call that state know-how (cfr. Audi 2018), if we want, but calling it the same does not entail that it is the same sort of state.

This sort of belief is the same sort of belief that intellectualists require of know-how. According to early formulations of intellectualism (Stanley & Williamson 2001; Stanley 2011), one knows how to ϕ only if for some way ψ to ϕ , one believes that ψ is a way for one to ϕ . But what does it mean for a way ψ to be a way for S to ϕ ? We do not want to require that S's ψ -ing invariably results in S's successfully ϕ -ing, nor that it results in S's successfully ϕ -ing in most cases, because Babe Ruth does know how to hit a home run, and yet fails at successfully hitting a home-run in many of the relevantly close worlds.⁹ In order for ψ to be a way for S to ϕ , all that is required is for ψ -ing to be *sufficiently likely* to result in S's successfully ϕ -ing, where what counts as “sufficiently likely” may vary with the task at hand (and the circumstances under which the task is being performed). This gets us to:

(Belief requirement on know-how) *s* knows how to ϕ only if for some way ψ -ing for *s* to ϕ , *s* believes that ψ -ing is a way for oneself to ϕ , where ψ -ing is a way for one to ϕ just in case it is sufficiently likely for one to succeed at ϕ -ing by ψ -ing.

Hence, the sort of belief required for intentionally performing an action is exactly of the sort that some intellectualists think it is required of know-how.¹⁰

Let me turn to some objections. Although the intentionality of an action requires a true belief about how to perform it, and although being in position to intentionally perform that action requires such a true belief, one might object that *the ability to perform it intentionally* does not. For example, suppose the action is sufficiently general and such to require different ways to perform it in different circumstances, as in the case of John the babysitter, who knows how to deal with different kids in different circumstances, but has no detailed plan about how to do so for each circumstance. On these bases, one might argue that, although intentionally performing an action at *t* requires a belief, the ability to perform an action intentionally does not.

⁹ Here, I am grateful to Bob Beddor for discussion.

¹⁰ Brownstein and Michaelson (2016) challenge a belief requirement on know-how but their challenge is unsuccessful (Cfr. Pavese 2016b for discussion of their criticism). Brownstein and Michaelson (2016) discuss studies showing that when catching a ball, ball players make anticipatory saccades to shift their gaze ahead their gaze ahead of the ball one or more time during the course of its flight toward them. These players know how to catch the ball, and they can intentionally do it, but they do not believe that making anticipatory saccades is part of how they catch the ball. Rather they believe they are tracking the ball all the time. Brownstein and Michaelson (2016) conclude that know-how does not require a belief. Not so fast! Note that from the fact that the players have possibly multiple false beliefs about how to catch the ball, it does not follow that they do not also possess true beliefs about how they do it. One way of motivating this idea is to appeal to a picture of our belief box as “fragmented” or “compartmentalized” (Lewis 1982; Stalnaker 1984) — a model of our doxastic life that is independently motivated. Indeed, all has been said so far suggests that that additional true belief *has to be there*, if they can intentionally catch the ball — i.e., if, in other words, there is a belief requirement on intentional action as standard action theory has it (*Intentionality/Belief*).

In response, notice that even the babysitter may have a belief about how to deal with kids in general, although the relevant belief might be about a way to perform the action that is not fully specific about the details of the possible situations where one finds oneself to deal with kids, and might become more detailed and complete when one is confronted with specific situations. For example, the babysitter will have true beliefs, independently of the specific kids, about how to find out the best coping strategies, about how to tell apart different kinds of kids, and so on. To the extent to which the relevant beliefs do not need to be a belief about a completely detailed way to deal with each kid, it seems plausible that the babysitter may also possess a true general belief about how to deal with kids.

I defended *Belief requirement on know-how* against a possible objection. Here are two positive arguments in its support.

The first argument is what I call *the argument from explanatory power*. Consider explaining an instance of intentional success such as a soccer player's intentionally succeeding at scoring a goal. It is striking that mentioning their knowing how to do so, together with the specific circumstances of the game, suffices for an explanation of their success. We do not need to mention *in addition* that they have certain beliefs about how to score the goal. If know-how did not involve beliefs, but intentionally performing an action did require a true belief about how to perform it (as *Intentionality/belief* has it), any similar explanation of the intentionality of the action would be lacking, for it would miss out on mentioning the relevant beliefs. That goes for many, possibly all, examples of intentional actions.

A second consideration in favor of *Belief requirement on know-how* is the *argument from verbal feedback*. Suppose we grant that know-how did not require a belief state about how to ϕ standing from one occasion of ϕ -ing to another. It is hard to explain on this view how know-how can be learned through verbal feedback and through trial and error. For example, suppose my tennis teacher tells me that I am not holding the racket correctly. It seems natural that their feedback will result in revising my beliefs about how to hold the racket. More generally, revising one's belief about how to perform an action seems a natural way in which know-how can be acquired and improved through verbal feedback. If *Belief requirement on know-how* is correct, this aspect of know-how can be easily captured. By contrast, if know-how did not require a *standing belief state* from one occasion to another, the acquisition of know-how through verbal feedback and trial and error could not be a matter of revising one's belief. Hence, a very natural

picture about what happens when we acquire or improve know-how through verbal feedback would not be available.

Because of these considerations, I join others (Stanley & Krakauer 2013; Cath 2015; and Pavese 2015a, Levy 2017) in thinking that *Belief requirement on know-how* is very plausible. Nonetheless, let me emphasize that, for the main goal of this essay, the weaker claim will do that know-how *requires a belief about how to perform the relevant task or at least the ability to come to have, at the time of their trying to ϕ , a true belief about how to perform it.* That know-how requires the latter ability follows quite straightforwardly from *Know-how/intentional Action* and *Intentionality/Belief*:

1. One knows how to ϕ only if one has the ability to intentionally ϕ . [*Know-how/Intentional Action*]
2. If one intentionally ϕ at t , then one believes at t , for some way ψ of ϕ -ing to ϕ , that one is sufficiently likely to ϕ by ψ -ing. [*Intentionality/Belief*]
3. If one has the ability (at t) to intentionally ϕ then one has at t the ability to come to believe, at the time of her trying to ϕ , for some way ψ of ϕ -ing, that one is sufficiently likely to ϕ by ψ -ing. [From *Intentionality/belief*, by substitution]
4. Hence, knowing how to ϕ requires having the ability to come to have, at the time of trying to ϕ , a true belief about how to ϕ . [1-3]

According to the conclusion 4), know-how is belief-involving but *in a weaker sense* — i.e., in the sense that it requires not just belief but the ability to form one when one tries to perform the relevant action.¹¹ I do take the *argument from feedback*¹¹ to be a powerful consideration on behalf of *Belief requirement on know-how* and against the view that know-how just consists in the ability to form a belief. However, the reader unconvinced that *Belief requirement on know-how* holds true in all the cases of know-how may take the main goal of this essay to be that of arguing that the sort of belief which know-how endows one with the ability to form cannot fall short of knowledge — i.e., that, in other words, know-how requires not just the ability to truly believe but *the ability to know*.¹²

¹¹Notice that 4) improves on Setiya's (2012) view in that it does not take the "intentionally" in "the ability to intentionally perform an action" as a primitive concept. Rather, it analyzes it in terms of belief.

¹²Although weaker than the standard intellectualist thesis, the conclusion 4) is compatible with the claim that, *in many and maybe even the majority of cases*, knowing how to perform that action does involve a true belief, and not just the ability to have one. Cfr. Dickie (2012), Lowenstein (2017) for views allowing know-how to be a disposition to form a belief and Stanley & Williamson (2017) for a view according to which skill is a disposition to know. See

The view that know-how is belief-involving (in either the weak or in the strong sense) has not gone unchallenged (Setiya 2012). In order to state Setiya's (2012) challenge, take an action ϕ that is basic for a subject s at a time t . What belief, if any, must s have in order to intentionally ϕ at t ? Suppose it was the belief that some further action ψ -ing is required for ϕ -ing. Then ϕ would not be basic for s at t . For there would be another action ψ that s must perform in order to perform ϕ . That means that the ability to exemplify a basic action type ϕ at will cannot depend on knowledge or belief of *means to ends*. If any belief is involved in explaining s 's performing a basic action ϕ intentionally, it must be the belief that ψ -ing is a way for one to perform ϕ , where ψ -ing is not an action, but rather a matter of *intending to perform it* and where *intending* is not itself a basic action (Cfr. Goldman 1970: 66; Setiya 2012: 291).

Setiya (2012: 291-5) considers the case of Mary, whose arm has been paralyzed for some time. Although Mary's in fact healed, she do not believe that she is. Hence, at the time of trying to clench, she does not believe that she is able to clench her fist, nor does she believe that she can clench by intending to do so. Call this case '*Clenching*'. According to Setiya, this does not stop Mary from clenching her fist intentionally, if she intends to do so. Moreover, Setiya (2012: 287 and ft. 4) observes that, for basic actions, the principle *Basic Knowledge* is very plausible:¹³

Basic Knowledge: If s intentionally ϕ 's at t and ϕ is a basic action for s at t , then s knows how to ϕ at t .

If one accepts *Basic Knowledge* and, moreover, one accepts the assumption Mary's clenching is intentional in that occasion, it follows by *Basic Knowledge* that Mary knows how to clench her fist — even though she does not believe that she is able to clench her fist by intending to do so. Hence, it follows that knowing how to perform basic action does not require a belief.

But why think that in the scenario sketched in *Clenching*, Mary's clenching is intentional? Some tokens of a basic action-type (for a subject at a time) can obviously be non-intentional, as when I clench my fist in my sleep (Goldman 1970: 18). Setiya does not explicitly

also Audi (2017: 288) for the idea that a disposition to form beliefs is necessary (although he claims not sufficient) for know-how. Pavese (2013; 2017) also discusses this sort of view. As Stanley & Williamson (2017) observe, the claim that skill is an ability to know is a form of intellectualism, in that it preserves the distinctively intellectualist claim that skillful actions characteristically manifest propositional knowledge. Although Stanley & Williamson (2017) argue for the claim that skills are abilities to know, they fail to provide arguments for thinking that knowledge, rather than true beliefs, is the sort of state that skills are abilities to be in. I undertake this task in the next sections.

¹³ It is true that some intellectualists (cfr. Snowdon 2004) deny *Basic Knowledge*. However, as noted by Setiya (2012), denying *Basic Knowledge* amounts to accepting the hardly believable consequence that we may not know how to perform some of our basic actions.

defend this assumption but we can imagine him arguing as follows:¹⁴ in *Clenching*, Mary intended to clench my fist;¹⁵ moreover, Mary happens to succeed. What more can be reasonably expected of Mary for her action to count as intentional? There are, of course, well-known cases involving deviant causal chains where one intends to ϕ and one succeeds at doing it but does not intentionally ϕ — like when one intends to be shaking in order to signal one’s confederate but this intention makes them nervous so that they shake but not intentionally (Davidson 1973). However, *Clenching* is not one of those cases. Hence, if something like the following I&I is correct, then Mary’s clenching must be intentional (assuming that she does intend to clench):

Intentions and Intentionality (I&I): If I intend to ϕ and my ϕ -ing is not the result of a deviant causal chain, my ϕ -ing must be intentional.

However, I&I does not hold in general. For example, a nuclear reactor is in danger of exploding and Fred knows that its exploding can be prevented only by shutting it down and that it can be shut down only by punching a certain ten digit code into a certain computer. By mere luck, he guesses the correct code and punches it in, thereby preventing a nuclear explosion. Fred’s action is too coincidental to count as intentional (Mele and Moser 1994; Gibbons 2001). Or consider a fair lottery: it seems that I cannot intentionally win it even if I intend to, because my winning would be too lucky to count as intentional (Gibbons 2001). These examples show that there are actions that are non-intentional despite being intended and despite not having been produced through deviant causal chains.¹⁶ Having independent reason to think that I&I is not true, we cannot use it to defend the claim that Mary’s clenching must be intentional.¹⁷

¹⁴ Here, I am grateful to Setiya for personal communication.

¹⁵ Wouldn’t it be more correct to say that, in a circumstance such as *Clenching*, one can only genuinely intend to *try* to clench but cannot possibly intend to clench? Cfr. Mele (1989a: 102). The view that intending to ϕ requires believing that one *will* ϕ (cfr. Harman 1976) has been discredited by Davidson’s (1980: 92) example of somebody heavily writing on a page in order to produce ten legible carbon copies, without having any confidence that they will succeed. Yet, other versions of the view are more tenable. For example, the relevant belief might be *that ψ -ing is a way for one to ϕ* , where ψ -ing is a way for one to ϕ only if it is sufficiently likely that, in suitably favourable conditions, one can ϕ by ψ -ing (Harman 1986; Ginet 1980: 77-8; Audi 1973: 388; 1986).

¹⁶ Setiya (2011:286) explicitly disagrees. In the bomb defusal case, he claims that Fred’s bomb defusing is (despite our intuitions to the contrary and *pace* Mele & Moser 1984) intentional. He also thinks that although the subject cannot be plausibly said to intentionally have won the lottery, it is acceptable to say that the subject intentionally got rich by so winning (pp. 286-87). Cfr. Cath 2015 for criticisms of Setiya (2011). Whether or not one sides with Setiya’s intuitions here, it is important to register that those intuitions come with a theoretical cost — the cost of invalidating *Part-whole*:

Part-whole If an action-token A is intentional, then there is a way of breaking down A into a non-empty sequence of actions B1, . . . , Bn such that A is generated by that sequence and each member of the sequence is also intentional.

Here is a more direct argument for thinking that Mary's clenching is *not* intentional. Distinguish between 'intentionality_{minus}' — as a property that an action-token possesses just in case (i) the action is intended and (ii) it is caused in the right non-deviant way by that intention; and 'intentionality_{plus}' — a property an action-token possesses just in case (i) the action is intended, (ii) it is caused in the right non-deviant way and, in addition, (iii) it satisfies a belief requirement. Now, consider:

Basic Action: ϕ is a basic action for s at t just in case s can (at t) ϕ intentionally without intentionally performing any other action.

Depending on how we interpret the two occurrences of 'intentionally' in **Basic Action**, we get two different definitions of basic actions, call them **Basic Action_{minus}** and **Basic Action_{plus}**. Now, there are independent reasons against taking **Basic Action_{minus}** to be a suitable notion of basic action. Only actions that can enter in plans that are available to the subject at a time are plausible candidates for being basic actions for a subject at that time. For the basic actions for a subject at a time must be actions a subject is, at that time, *able to plan from*, if only the subject were to engage in a little of reflective effort. But in a circumstance where I explicitly (that is, upon considering the question) did not believe that I can perform an action (such as clenching my fist) by merely intending to, I would not be in position to plan a complex action that has clenching my fist as its part. For example, I would not be at a time t in position to plan to clench my fist twice in a row if I did not even believe that I can clench my fist once. If basic actions for a subject at a time are to play a role in the subject's planning at that time — as it seems plausible on a conception of intentionality strongly tied to planning — we have independent reasons to prefer **Basic Action_{plus}** to **Basic Action_{minus}**.

Invalidating *Part-whole* comes with the cost of allowing the intentionality of a complex action to emerge mysteriously out of non-intentional actions. Arguably, a principle along the lines of *Part-whole* can explain, for example, why deviant causal chain cases are non-intentional, by providing a gloss on what it means for an action to be "appropriately caused" by one's action plan. For example, take Chilshom's (1964) famous case where a man believes that if he kills his uncle he will inherit a fortune, and suppose he desires to inherit a fortune; this belief may agitate him and cause him to drive in such a way that he accidentally kills his uncle. The subject has a belief that causes his killing, and yet the killing is not intentional. As Goldman (1970) points out, the belief does not cause the killing in the appropriate way, but has little to say about what counts as an "appropriate way." One way of spelling this out is to appeal to *Part-whole* intentionality and to point out that in this case not every action that is part of the action that led to the killing is intentional: his driving in a certain nervous way was not intentional and it was not because the subject did not believe that driving that way was how to kill his uncle; the target action (such as killing the uncle), although intended, is achieved through actions that are not themselves intentional.

¹⁷ Setiya (pc) pointed out to me that *Clenching* satisfies Anscombe's (1957) criterion for intentional action: it would make sense to ask Marie *why* she clenched. By this criterion, Marie's clenching counts as intentional. However, one might object that although necessary for intentional action, Anscombe's criterion is not sufficient. More argument is needed for the sufficiency of Anscombe's criterion for intentional action, which is far from obvious.

3. Know-How to be Gettiered?

Far from undermining a doxastic requirement on know-how, the possibility of basic action leads us to see why know-how needs to be belief-involving in the sense of requiring a belief or at least the ability to form one at the time of the action.

I have argued that understanding know-how as belief-involving in this sense is in compliance with a plausible conception of intentionality of the sort that we find clearly defended by Goldman (1970) and others. But if know-how is belief-involving, the question arises: can the relevant belief fall short of knowledge?

In the literature, several authors have pointed out that know-how seems to survive in Gettier situations (Poston 2009:745-6; Cath 2011, 2015; Carter & Pritchard 2015). For example, consider Cath's (2011) *The Lucky Light Bulb*:

The Lucky Light Bulb: Charlie wants to learn how to change a lightbulb, but he knows almost nothing about light fixtures or bulbs (as he has only ever seen light bulbs already installed and so he has never seen the end of a light bulb, nor the inside of a light fixture). To remedy this situation Charlie consults *The Idiot's Guide to Everyday Jobs*. Inside, he finds an accurate set of instructions describing the shape of a light fixture and bulb, and the way to change a bulb. Charlie grasps these instructions perfectly. And so there is a way such that Charlie now believes that way is a way for him to change a light bulb, namely, the way described in the book. However, unbeknownst to Charlie, he is extremely lucky to have read these instructions, for the disgruntled author of *The Idiot's Guide* filled her book with misleading instructions. Under every entry she intentionally misdescribed the objects involved in that job, and described a series of actions that would not constitute a way to do the job at all. However, at the printers, a computer error caused the text under the entry for 'Changing a Light Bulb', in just one copy of the book, to be randomly replaced by new text. By incredible coincidence, this new text provided the clear and accurate set of instructions that Charlie would later consult.

Cath (2011) observes that intuitively Charlie knows how to fix the light bulb, despite his belief being Gettiered. On this basis, Cath (2015) argues that the right form of intellectualism

about know-how is ‘revisionary’: while “orthodox” intellectualism about know-how identifies know-how with propositional knowledge, revisionary intellectualism identifies know-how with true belief that may well fall short of knowledge.

Carter & Pritchard (forthcoming) have observed that intuitions of the sort voiced by Poston (2009) and Cath (2011, 2015) are considerably stronger when we consider cases involving *environmental luck* rather than *intervening luck*. Intervening luck is observable when epistemic luck ‘intervenes’ between the agent’s cognitive performance and her cognitive success. That is the sort of luck reproduced for know-how by Poston (2009) and Cath (2011). As Carter & Pritchard (2015) observes, that is not the only possible sort of epistemic luck: in some cases such as Goldman’s (1976) fake barns case, epistemic luck does not concern a disconnect between cognitive performance and cognitive success and is purely environmental. For example, suppose that, rather than gaining his instructions on how to change a bulb from a fake but by chance accurate guide, the guide itself is entirely reliable and authoritative but it is the case that Charlie could so very easily have opted for a fake guide instead. Imagine, say, that Charlie has a shelf-full of guides before him, all but one of which is fake, and that had he opted for one of the fake guides he would have ended up with incorrect information about how to change a bulb. Carter & Pritchard (2015) report that in this particular case the intuitions are stronger than Charlie does know how to change a lightbulb.

However, it is far from clear that in Poston’s, Cath’s or even in Carter & Pritchard’s scenarios, we *at once* intuit the know-how claim as true and the propositional knowledge claim as false, as evidenced by the fact that, as observed by Marley-Payne (2016), the following conjunction sounds like a straightforward contradiction, both in cases of intervening luck and in cases of environmental luck:

(Ca) Charlie knows how to fix a lightbulb, but does not know that he needs to unscrew it in order to replace it with a new one. [**Marley-Payne’s contradiction**]

In addition to Marley-Payne’s contradiction, the following conjunctions all sound rather weird:

(Cb) Charlie knows how to fix a light bulb, but does not really know the instructions in the manual.

(Cc) Thanks to the instructions in the manual, now Charlie knows how to fix the light bulb, although he does not know that he can fix it by following the instructions in the manual.

And yet, if Charlie did know how to fix a light bulb in the scenarios sketched by Cath (2001) or Carter & Pritchard (2015) but really did not have the corresponding propositional knowledge, (Ca)-(Cc) must accurately describe Charlie's epistemic situation.

A further consideration is that in high-stake cases, intuitions that know-how survives in Gettier scenarios (whether involving environmental or intervening luck) are considerably weaker. Suppose a surgeon did not know how to perform a very difficult surgery, one that has a very low chance of success even when executed by the most expert surgeon and that if executed poorly would almost certainly result in the death of the patient. Suppose that by sheer (environmental) luck, the surgeon were to pick up the right textbook among hundreds and were to perfectly master the textbook's instructions. Here, we are less tempted to judge that the surgeon thereby knows how to perform the difficulty surgery.

We seem to have reached an aporia. Poston (2009), Cath (2011, 2015), and Carter & Pritchard's (2015) cases seem to provide some support for the idea that know-how's epistemic profile is different from propositional knowledge. On the other hand, Marley-Payne's (2016) contradiction and high stake cases at the very least indicate that our intuitions do not support the thesis that know-how and propositional knowledge differ in their epistemic profile nearly as clearly as this recent debate often supposes. A fully satisfactory theory of know-how should be able to account for *both sets of intuitions* — for both Poston's (2009), Cath's (2011) and Carter & Pritchard's (2015) set of intuitions on one hand and for Marley-Payne's (2016) contradiction and high stake cases on the other. At the current state of the play it is unclear whether *any* extant view of know-how (whether intellectualism — revisionary or orthodox — or anti-intellectualism) is well positioned to do so.¹⁸

I will not undertake the difficult task of showing how orthodox intellectualism can account for Poston's, Cath's and Carter & Pritchard's set of intuitions.¹⁹ Rather, I will provide a theoretical argument for thinking that the sort of belief state involved in know-how must be subject to an anti-luck condition (§4) — plausibly the same anti-luck condition knowledge is

¹⁸As Marley-Payne (2016) observes, an intellectualist friendly explanation of both sets of intuitions might require a subtle form of contextualism for both knowledge ascriptions and know-how ascriptions, one that would have to explain at once why knowledge ascriptions come out false when taken in isolation in standard Gettier scenarios but true when taken together with know-how ascriptions. Finally, the relevant context-sensitivity would also have to allow for sensitivity to stakes. In addition, as noted by Cath (2015:12), in view of *Know-how/intentionality*, the relevant analysis would have to explain away our intuitions according to which Gettiered subjects such as Charlie and Bob may act intentionally on their Gettiered beliefs.

¹⁹For an error theory of Cath's and Poston's intuitions, see Stanley (2011, chapter 8).

subject to (§5). If the argument is cogent, we will have a new theoretical reason to look for an alternative explanation of the widespread intuition that know-how survives in Gettier situations.

4. Know-how, modal robustness, and safety

In this section, my aim is to provide an argument for an anti-luck condition on the sort of belief state that know-how involves. In particular, I will argue for a safety constraint on know-how, analogous to the safety constraint on knowledge. My argument resembles a recent argument by Greco (2016) for a safety condition on knowledge, so that is where I start in order to introduce my own argument.

4.1 An argument for a safety constraint on knowledge

What is a safe belief? Distinguish strongly safe beliefs from weakly safe beliefs:

Strong Safety: A belief is safe just in case it is true in all the close cases.

Weak Safety: A belief is safe just in case it is true in most (or sufficiently many) of close cases.

Call **Strong Safety** the requirement that knowledge involve a strongly safe belief and **Weak Safety** the requirement that knowledge involve a weakly safe belief.²⁰

Greco (2016) aims at providing an argument for **Strong Safety**. The starting point of Greco's (2016) argument for thinking that there must be an anti-luck condition on knowledge is the thesis that satisfactory explanations must be "modally robust," in the sense that they must show that their *explananda* are not mere flukes.

What is a fluke? Say that an event is a *fluke* just in case it does not occur in most (or sufficiently many) of the close cases; and say that an event is *weakly safe* just in case it occurs in most (or sufficiently many) of the close cases; finally, an event is *strongly safe* just in case it occurs in all close cases.

Greco (2016) points out that satisfactory explanations must be "modally robust," in the sense that they must show that their *explananda* are not mere flukes. The general idea is that an

²⁰Both requirements have advocates in the current literature. Sosa (1999), Williamson (2000), and Greco (2016) defend a version of **Strong Safety**. By contrast, Pritchard (2012), Sosa (2015), and John Greco (2016) discuss a weaker version of safety. Pritchard (2012) talks of safe beliefs as ones formed according to a method that "would reliably yield correct answers," underwriting something like the definition of safety of a belief in terms of sufficiently many of the close worlds where it is true. Cfr. Sosa (2015:117-21). John Greco (2016:53) formulates it in terms of "most or almost most" close worlds where it is true.

event for which a satisfactory explanation can be found will occur in most (or sufficiently many) of the close cases other than the actual — i.e., it will be at least *weakly safe*.²¹ An explanation of an event is satisfactory only if it predicts that the event occurs in all of the cases where it does occur. So if the event is weakly safe, the explanation will be satisfactory only if it holds in most (or sufficiently many) of the close cases; if the event is strongly safe, the explanation will be satisfactory only if it holds in all of the close cases.

The hypothesis that explanation must show their *explananda* are not mere flukes is widely endorsed in the philosophy of science (Railton 1981; Woodward 2000; Strevens 2006). Here is an illustrative example from Strevens (2006: 434-5). Suppose a marble is dropped in a basin, and after rolling around for awhile, it comes to rest at the bottom of the basin. Consider two ways we might go about explaining why it came to rest where it did. First, we might calculate the trajectory of the marble, given the starting point, and the gravitational and frictional forces acting on the marble at each moment; and then we might note that at the end of its trajectory, it is at rest at the bottom of the basin. Second, we might appeal to some generalizations about gravity and potential energy to show that, no matter where it was dropped from, it would have ended up at rest at the bottom of the basin. As Strevens (2006: 435) points out, if you understood the first explanation, but not the second, you might think that the marble's ending up at the bottom of the basin was an accident or a fluke. But once you grasp the second explanation, you see that it is *no accident* that the marble came to rest where it did — not only did it actually end up there, but it would have done so under all sufficiently similar conditions. Hence, the second explanation has a virtue that the first does not have in that it shows its *explanandum* not to be a fluke, by predicting that it would occur across a range of close cases. Strevens (2006) calls this virtue of explanations “causal robustness” and Greco (2016) calls it “modal robustness.”

This and other examples suggest that explanations count as satisfactory provided they show their *explananda* not to be a fluke — i.e., provided they predict that it would occur across a range of close cases. Barring good reasons for thinking that folk explanations of intentional success should not be held to the same kind of standards to which scientific explanations are

²¹As Daniel Greco (2016: 189) notes, if the *explanandum* is a fluke, a non-modally robust explanation might be all that is available. If one hits the jackpot in a fair lottery, the best one can do to explain the victory is to show that the winning was possible. In cases such as these, showing the *possibility* of an event is all that can be done.

held, we have got some reason to think that a satisfactory explanation of intentional success must also be modally robust in the sense clarified.

This is the first premise of Greco's (2016) argument. The second premise is that beliefs, in particular *true* beliefs, play a central role in explanation of behavior and in particular in explanation of successes.²² With these two premises in play, Greco (2016) points out that true but unsafe beliefs would not provide a satisfactory explanation of success. To illustrate, consider the case of Alice, who is visiting Rome and who purposefully reaches the Colosseum during her sightseeing. We might ask how Alice managed to end up, not just anywhere, but where *she wanted to be* — i.e., at the Colosseum. And to explain her success, we will invoke the true beliefs that she has about the location of the Colosseum: Alice cannot intentionally have ended up at the Colosseum without true beliefs about how to get there. So far so good. Now, further suppose that Alice came to believe, out of sheer optimism, that there is a train to the Colosseum that stops at the nearest metro station to her hotel, and as it turns out she is right. Her belief is unsafe. Hence, there are sufficiently similar cases where her belief is false — call such case “E” — where, for example, there is no train to the Colosseum that stops at the nearest station to Alice's hotel and where Alice will not reach the Colosseum. Hence, an explanation of her reaching the colosseum will not show that it occurs in all close cases; hence it will not be satisfactory.

Greco (2016:190) concludes that *success based on unsafe beliefs is always a fluke*. If there is ever going to be a satisfactory explanation of intentional success, it must be in terms of safe beliefs. Assuming further that knowledge plays an uneliminable role in explaining success (Williamson 2000; Nagel 2013), the argument concludes that there must be a safety requirement on knowledge.

One might wonder, however, whether Greco's argument really succeeds at establishing **Strong Safety**. Anne might have easily be run over by a nearby bus. If so, her reaching the Colosseum is not strongly safe. But her actual success might still be susceptible of a satisfactory explanation, for we might suppose it still occurs in most (or sufficiently many) of the close worlds where she is not run over by a bus. If so, it seems that, for an explanation of her success to be satisfactory, it must only predict that it occurs in most (or sufficiently many) of the close worlds — call this range R — even if those are not the totality of the range of all close worlds —

²²As we have seen in §2, this premise has a lot going for it.

call this T — where R is properly included in T. It does not need to predict that it also occurs across T. At most, the argument seems to establish **Weak Safety**.

Greco's argument supports a version of **Strong Safety**, however, provided that one thinks of strong safety as the requirement that beliefs be strongly safe*:²³

Strong Safety*: A belief is strongly safe* just in case it is true in all the *relevantly* close cases.

Strong Safety* quantifies over *a subset* of the close cases to the actual: the relevant ones. Call **Strong safety*** the thesis that knowledge requires strongly safe* belief. The idea motivating **Strong safety*** is that when we are looking for an explanation of Anne's success, certain unfavourable possible worlds where she might have run over a bus are not relevant. Because what counts as the relevant worlds is fixed by the context of explanation, Strong Safety* is committed to taking safety to be context-relative.^{24,25}

Is there any reason to prefer **Strong Safety*** to the corresponding **Weak Safety***? Here is one. We want to be able to distinguish between *explanation of an event* and *explanation of an event happening with a high probability of success*. This distinction is salient when it comes to prediction. One thing is to predict that *I will most certainly lose a lottery*; an altogether different thing is to predict that *I will lose a lottery*. Given the intimate relation between explanation and prediction, it is reasonable to expect that we should find the same distinction in the realm of explanation. An explanation that only shows an event to occur in sufficiently many, but not all, of the cases of the (relevant) range would only explain an occurrence of an event with some degree of probability. In order to explain an event *simpliciter*, we might need explanations that are strongly safe in Greco's sense.

With this in mind, in the following I will be assuming that, if one accepts the fundamental assumption that knowledge plays an uneliminable role in explaining success, Greco's argument does establish *at least* **Weak Safety**. The argument also establishes **Strong Safety*** if in addition

²³ Greco (2016) actually formulates safety as truth in all the relevant cases, rather than in all the relevantly close ones, thereby departing from the usual understanding of safety as based on a similarity metric. This complexity, and the considerations that Greco (2016) gives to motivate it, will not matter here.

²⁴ It is notoriously difficult to spell out what conditions count as relevant. But this problem is not specific to the explanatory role of beliefs *vis a vis* success: arguably, it is a problem that is inherited by the context-sensitivity of explanation.

²⁵ Thanks to Daniel Greco for discussion here.

one is happy to endorse a particular form of contextualism about safety, explanation, and knowledge.

4.2 *An argument for a safety constraint on know-how*

Here is, then, an argument for a safety requirement on know-how. The first premise is that know-how plays a role in an explanation of intentional success. This is, I take it, uncontroversial: after all, we ordinarily use know-how ascriptions — such as “Anne Bonny knows how to hijack vessels”²⁶ or “Usain Bolt knows how to run 100 meters” — to explain intentional successes. For example, we might explain Anne Bonny’s successful hijacking a vessel by citing, among other things, the fact that she knew how to do it; or we might explain Usain Bolt’s successfully running a 100-meter race by citing, among other things, the fact that he knows how to run one.

Although some luck might have contributed to the success, if the successful event to be explained is not a fluke, there will be a range of close situations where it occurs throughout. But we have seen good reasons to think that if an explanation of that successful event has to be satisfactory, it must predict that the event will occur across that range of close cases. Consider again Bonny’s success at hijacking a vessel named *Pirates*. If Bonny’s success is not a fluke, it must hold true across a range of close cases. Call such a range R. If satisfactory explanations must show their *explanandum* not to be a fluke, explaining Bonny’s success at hijacking a vessel in terms of her knowing how to do so (together with the details of the situations and other relevant generalizations) must predict that she would have succeeded across R. Now, suppose that her know-how involved an unsafe belief. Then, in several close worlds in R, Bonny might have a false belief about hijacking *Pirates*, and based on that belief, her actions might fail. Then an explanation appealing to her know-how would fail to predict her success across R. Hence, if know-how can ever occur in satisfactory explanations of intentional success, it ought to require not just true belief — as argued in §2 — but outright safe belief.²⁷

²⁶ Anne Bonny was an exceptionally skilled Irish pirate, operating in the Caribbean.

²⁷ Could one deny that know-how is needed in explanations of intentional success by arguing that the role played by know-how in those explanations could be played by something else? For example, could not we explain Bonny’s success simply by citing her *ability to hijack*? Note that Bonny’s mere ability will fail to explain her intentional success. As the previously considered case of Ruth and other examples show (§2), one’s ability to ϕ might explain one’s success at ϕ -ing but cannot suffice to explain intentional success at ϕ -ing (Bengson & Moffett 2007, 2011a, 2011b; Bengson & Moffett & Wright 2009; Pavese 2015a). For that, one would need the ability to intentionally ϕ . But as we have seen at the outset, the ability to intentionally ϕ goes together with one’s knowing how to ϕ and is to be explained in terms of it. If so, then nothing less than know-how can explain one’s intentional success.

Like Greco's (2016) argument before, this argument *prima facie* faces the following objection. Know-how can enter in explanations of successes that are, to a considerable extent, lucky. Consider mundane cases of tasks that we know how to perform without having the ability to safely succeed at performing them. Rashid might know how to cook all kinds of delicious dishes, but because they are complex, he sometimes end up mucking them up, failing to produce delicious dishes. His successfully producing a delicious dish is not a safe outcome (Hawley 2004:24).

In response, just like Greco's claim is not that knowing the directions for the Colosseum entails safe success at reaching to the Colosseum, my claim is *not* that knowing how to perform a task entails safe success at performing the task. For example, certainly knowing how to cook a dish by itself does not guarantee success in all the close cases. Greco's point, like mine, is rather the following: a non-fluke event will occur in most (or sufficiently many) cases other than the actual; hence, for an explanation of a non-fluke event to be satisfactory, it must show the event to occur across most (or sufficiently many) of the close cases. This range of cases might coincide with the range of relevantly close cases — in which case, we get **Strong Safety***. If it does not, we still get at least **Weak Safety**.

This argument provides us with a novel theoretical motivation for thinking that the belief that know-how involves cannot be unsafe. However, it fails to establish that know-how has the same epistemic profile as knowledge, because even if necessary (weak or strong) safety may fail to be sufficient for knowledge (Sosa 2007; Pritchard 2012).²⁸ In order to buttress the hypothesis that know-how and knowledge do share the same epistemic profile, in the next section I advance a more direct argument for the claim that whatever is needed in addition to true justified belief to get knowledge is also needed in addition to true justified belief to get know-how. My argument starts by defending an argument by Gibbons (2001) for thinking that nothing less than knowledge can explain intentional success against a recent objection raised by Cath (2015).

5. Know-how and Lotteries

Gibbons (2001:589–90) asks us to consider a lottery case, involving the following three scenarios. In **Scenario 1**, Cindy buys a lottery ticket in a fair lottery, knowing that her chances

²⁸Some find a safety condition on knowledge controversial (Rohrbaugh and Neta 2004; Comesaña 2005; Bogardus 2014; Kelp 2016). But see Lasonen-Aarnio (2010) for a defense of a throughout modal account of knowledge.

are a million to one, and she wins. In this case, with a fair lottery, Cindy's winning is too accidental and too lucky to count as intentional. In **Scenario 2**, Cindy knows the lottery is rigged in her favor and knows that if she buys a ticket she will win. In this case, Cindy intentionally wins the lottery. In **Scenario 3**, Cindy mistakenly believes someone rigged the lottery in her favor. She believes, on this basis, that if she buys a ticket, she will win. She buys the ticket and wins. So her belief about winning is true. She even has a justified true belief.

Is Cindy's success intentional in **Scenario 3**? Gibbons (2001: 587–8) argues that it is not, for the winning is just as accidental and lucky as in **Scenario 1**, and in **Scenario 1**, Cindy's winning is clearly not intentional.²⁹ Her chances were 1 over a million. In general, it does not seem like one can intentionally win a fair lottery, for winning a fair lottery is not sufficiently under one's control to count as intentional. Moreover, the only difference between **Scenario 1** and **Scenario 3** is that in **Scenario 3** Cindy has the true belief that her ticket will win. But that belief is true by luck. It is hard to see how the mere fact of possessing a belief true by luck would make the outcome of the lottery under Cindy's control. So, if Cindy's victory is not intentional in **Scenario 1**, it cannot be intentional in **Scenario 3**. However, in **Scenario 3**, Cindy both truly and justifiably believes that she will win the lottery by buying a ticket. Hence, intentional action requires more than true and justified belief. If so, a plausible explanation for why her victory is not intentional in **Scenario 3** is that Cindy does not *know* that she will win the lottery by buying that ticket, as she instead does in **Scenario 2**.

Cath (2015: 18-9) points out that there is an alternative way of explaining the intuitive lack of intentionality in **Scenario 3**. Cindy's belief is not about *a reliable way of winning a fair lottery*, for buying a lottery ticket is not a reliable way of winning a fair lottery.³⁰ So, Cindy's victory involves not just luck in the forming of his belief — which Cath (2015: 20) calls “upstream luck,” the sort of epistemic luck we also find in Charlie's lightbulb case (§3); it also involves “downstream luck,” that is, luck involved in how the success is reached. Hence, one might worry, with Cath (2015), that Gibbons' case does not really show that knowledge is

²⁹One might contend that winning a fair lottery is not an action that can be performed intentionally and that that *by itself* explains why Cindy cannot win the lottery intentionally. But that would miss the point. The point is exactly to explain *why* winning a fair lottery is not an action that can be performed intentionally. Gibbons' (2001) response to this question, as I understand it, is that winning a fair lottery is not an action *one can ever know* that one will succeed at performing.

³⁰ Cath (2015) only discusses one of Gibbons' cases, the one involving Harry's trying to kill his uncle. But the same consideration discussed in the text applies to Harry's case.

required for intentional action; it only shows that intentional action requires beliefs about *sufficiently reliable ways* to perform it.

I agree with Cath's (2015) criticism of Gibbons' cases. But I am not convinced that Cath's (2015) criticism is deadly for Gibbons' general argument. For Gibbons' examples can be re-described in such a way to relegate all the relevant downstream luck into upstream (or epistemic) luck. While it is true that *buying a ticket* is not a sufficiently reliable way of winning the lottery, *buying a (particular) ticket that one truly believes to be the winning ticket* is a *perfectly* reliable way of winning the lottery. And we might suppose that, at the moment of buying the ticket, Cindy does believe truly of a particular ticket that she can win the lottery by buying that ticket that she truly believes to be the winning ticket. (For example, we might imagine that Cindy justifiably believes that the lottery is rigged in such a way that, while handed to her at the betting office, the ticket is henceforth marked as the winner. And that, although the ticket is, as a matter of fact, the winning ticket, it is not so because of the plot believed by Cindy.) If we describe Cindy's scenario in these terms, her winning the lottery by acting on the basis of that belief depends on *even less* downstream luck than most actions that we ordinarily deem intentional, for most intentional actions are produced in accordance with less than perfectly reliable plans.

Now, even so described, it is still true that Cindy is not winning the lottery intentionally: because the lottery is, as a matter of fact, fair, her victory is still not under her control and is too fortuitous to count as intentional.³¹ But the residual sense in which her victory is not under her control is now *epistemic*: being her true belief based on false information about the lottery being rigged, she *does not know* that she will win the lottery by buying what she truly believes to be the winning ticket. Because **Scenario 3** can be re-described in such a way to turn all the alleged downstream luck into upstream (or epistemic) luck, and because even when so described, we observe lack of intentional behavior, it seems to me that Gibbons is generally on good grounds to conclude that the lack of intentionality must be due to Cindy's belief falling short of knowledge.

³¹ If this sounds contentious, consider the bomb defusal case (Mele & Moser 1994: 40), also discussed in §2, and which Cath (2015: 13, and fn. 11) takes to be a case where the successful bomb defusal is not intentional. Now consider a variant of the bomb defusal case, where not only does Fred rightly guess the ten digit code but also comes to believe, out of sheer optimism, that it is the correct code. Fred's defusing the bomb does not seem to be any more intentional just because Fred has now acquired that belief. *Mutatis mutandis*, Cindy's acquiring a true belief about a perfectly reliable method does not make her victory in a fair lottery any more intentional.

Here is, then, an argument for the claim that know-how cannot be anything less than knowledge. Cindy does not have the ability to intentionally win the lottery in **Scenario 3**, because her winning would be too accidental and fortuitous to count as intentional. Because Cindy does not have the ability to intentionally win the lottery in **Scenario 3**, by *Know-how/Intentionality* (§2), she must not know how to win the lottery. But suppose know-how were, or involved, a true belief that did not amount to knowledge. We would then predict that Cindy knows how to win the lottery, for she does have a true and justified belief about how to win the lottery. If so, however, true and justified belief does not suffice for know-how: know-how cannot be less than knowledge.

6. Conclusions

The role of know-how in explaining intentional success shows that the epistemic differences between know-how and knowledge, if any, are in any case much less than the “epistemic difference” critics of intellectualism allege. Moreover, it shows that the sort of revisionary intellectualism that Cath (2015) envisages — one that takes know-how to be, or to involve, a possibly lucky true belief — is not really a stable position.

The argument outlined in this essay also has repercussions for the question of the value of know-how, from which I started. Know-how has a special explanatory role *vis a vis* intentional success. And that is what makes it valuable. What is its value due to? The line of argument in §§2–5 supports the idea that it is because know-how involves propositional knowledge that has a special explanatory link to success. For it shows that, if know-how involved a true belief that falls short of knowledge, it could never figure in satisfactory explanations of intentional success. But it can. And that is what makes for a good chunk of its value. If so, the value of know-how must be due, to a considerable extent, to its being, or its involving, propositional knowledge.

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