

HOW DO WE KNOW HOW?

Josefa Toribio

Abstract

I raise some doubts about the plausibility of Stanley and Williamson's view that all knowledge-how is just a species of propositional knowledge. By tackling the question of what is involved in entertaining a proposition, I try to show that Stanley and Williamson's position leads to an uncomfortable dilemma. Depending on how we understand the notion of contemplating a proposition, either intuitively central cases of knowing-how cannot be thus classified or we lose our grip on the very idea of propositional knowledge, which then fails to demarcate any clear class of cases. I conclude with a brief discussion of the nature and role of knowledge-how, and its relation to the important, but less explored, notion of expertise.

Key words: knowing-how, proposition, proprioceptive awareness, visual agnosia, expertise.

Introduction

Against Ryle (1946; 1949), Stanley and Williamson (2001) argue that all knowledge-how is just a species of propositional knowledge. On their view, the following attribution of knowledge:

Hannah knows how to ride a bicycle

is true “if and only if there is some contextually relevant way w such that Hannah stands in the knowledge-that relation to the Russellian proposition that w is a way for Hannah to ride a bicycle” (*op. cit.* 430). A sentence such as ‘Hannah knows how to ride a bicycle’ thus requires for its truth that Hannah entertain a (Russellian¹) proposition. If Hannah knows how to ride a bicycle, then Hannah stands in a standard knowledge-that relation to a complex, syntactically structured, entity whose basic components are the very objects and properties Hannah thinks and talks about. In particular, Hannah stands in a standard knowledge-that relation to —among other objects and properties— the ordered sequence of an object —herself— and a way of engaging in the action of riding a bicycle —considered as the property of a token event. Since properties are always entertained under different modes of presentation, ways (of engaging in action), as properties, must also be thus entertained². In know-how contexts, the relevant mode of presentation is a practical one. What is it for a way to perform an action to be presented under a practical mode of presentation? Here the authors admit to being unable to clarify this notion in any nontrivial fashion, even though “thinking of a way under a practical mode of presentation undoubtedly entails the possession of certain complex dispositions” (*op. cit.* 429). The case of Hannah standing in a standard knowledge-that relation to a proposition containing a way of engaging in action under a practical mode of presentation is parallel —Stanley and Williamson claim— to first-person modes of presentation of the kind expressed by sentences such as ‘John believes that he himself has burning trousers’. In both cases, the subject’s entertaining the relevant proposition entails the subject’s possession of a complex set of dispositions. Here —still according to Stanley and Williamson— lies both the attraction of Ryle’s dispositional analysis but also its incorrectness. If they are right, the fact that entertaining a proposition in the guise just described entails the subject’s possession of a set of complex dispositions does not underwrite or otherwise justify the claim that knowledge-how is a distinctive kind of

nonpropositional knowledge. Stanley and Williamson support their view using semantic evidence coming from a particular analysis of sentences containing embedded questions³. The evidence suggests that sentences used to attribute knowledge-how are best analysed as expressing a relation between a person and a proposition.

A number of recent papers (see e.g. Hawley 2003; Koethe 2002; Noë 2005; Rosefeldt 2004; Rumfitt 2003; Schiffer 2002; Snowdon 2004) have tried to show that Stanley and Williamson's argument does not undermine Ryle's position, thus reopening a debate that already had some interesting contributions on both sides of the argument from the 50's and 70's (see e.g. Brown 1970; Carr 1979, 1981; Ginet 1975; Hartland-Swann 1956, 1957; Hintikka 1975, Roland 1958). Unlike the majority of these critics, I am not interested in whether Stanley and Williamson manage to undermine Ryle's distinction. My target is Stanley and Williamson's positive view. I aim to raise some doubts about the plausibility of their position by tackling the rather different question of what is involved in entertaining a proposition.

Propositions are standardly characterised as the contents of thought. They are mind- and language-independent items to which we assign truth conditions. When one entertains a proposition, one enters into a relationship with a rather abstract entity—even if, as in the case of Russellian propositions, the basic components of such complex entities are objects and properties themselves and not their mode of presentation. The question I want to tackle here is precisely how we are to understand this relationship in the case of knowledge-how. My discussion will follow two basic proposals introduced by Stanley and Williamson while arguing against Ryle's contention that knowledge-how is non-propositional. On the first, the authors fall back on what they consider to be a natural reading of 'contemplating a proposition', one in which the action of contemplating a proposition is construed as intentional. On the second, contemplating a proposition is characterised as the 'sort of action that is no more intentional than is the action of digesting one's food' (*op. cit.*, 416). I draw on both of these proposals to argue that it makes no sense to characterise knowledge-how in propositional terms and thus that Stanley and Williamson's view ought to be rejected. The paper is structured as follows.

In Section II, I'll discuss the consequences of applying what we can call the *natural* interpretation of the act of contemplating a proposition to Stanley and

Williamson's own view on knowledge-how. I argue that, if knowledge-how is a species of propositional knowledge, and the act of entertaining a proposition is intentionally construed in the way they suggest, their own view fails to accommodate certain intuitively relevant cases of knowing-how. In Section III, I briefly discuss the shortcomings of the second proposal before introducing a more charitable interpretation of what is still a sub-personal analysis of the act of contemplating a proposition, but one where it makes sense to apply the notion of personal agency. I then show that even under this more charitable interpretation Stanley and Williamson's view turns propositional knowledge into a mystery. Their contention that knowledge-how is a species of propositional knowledge thus leads to an uncomfortable dilemma. Depending on how we understand the notion of contemplating a proposition, either intuitively plausible cases of knowing-how cannot be thus classified or the very idea of propositional knowledge fails to demarcate any clear class of cases. I end the paper (Section IV) with a brief and more positive discussion of knowledge-how as a notion whose clarification benefits from its alliance with the concept of expertise.

Contemplating a proposition: an intentional act

Although, as already stated, I am not directly interested here in Stanley and Williamson's arguments against Ryle's view, it is certainly the right place to look for an insight into what they consider possible referents of 'contemplating a proposition'. The topic comes up, in particular, while trying to show that Ryle's premises in his so-called "vicious regress" argument are false. These are the premises:

1. If one φ -s, one employs knowledge how to φ .
2. If one employs knowledge that p , one contemplates the proposition that p .

Premise (1) is true only when restricted to the realm of intentional actions, so it is false as it stands, but that restriction was already present in Ryle's argument and it remains the same in Stanley and Williamson's alternative account. It is premise (2) that becomes more interesting for our purposes because it is in the course of justifying its falsity that we can find Stanley and Williamson's take on the phenomenon of

entertaining a proposition. Premise 2 is false, they claim, because “on a natural construal of ‘contemplation’, it is simply false that manifestations of knowledge-that must be accompanied by distinct actions of contemplating propositions” (*op. cit.*, 415). They borrow the argument from Ginet:

I exercise (or manifest) my knowledge that one can get the door open by turning the knob and pushing it (as well as my knowledge that there is a door there) by performing that operation quite automatically as I leave the room; and I may do this, of course, without formulating (in my mind or out loud) that proposition or any other relevant proposition. (Ginet 1975, in Stanley and Williamson 2001, 7)

Regardless of what we may think about Ginet’s passage and about its appropriation by Stanley and Williamson in lieu of an argument to support the falsity of premise (2), linguistic articulation and / or tokening of a syntactically and semantically structured mental representation seems to be the central feature of this *natural* interpretation of the act of entertaining a proposition. If premise (2) is false because one can employ knowledge that p without formulating the proposition p , then it is false on the understanding that contemplating the proposition p is logically equivalent to verbally formulating p or tokening p in some language of thought.

It is indeed fairly common to use ‘proposition’ as referring to a sentence. That’s, for instance, the standard usage in most discussions involving the notion of propositional attitude. Yet Russellian propositions are not linguistic objects. They are the contents of thoughts, individuated by the objects and properties we think about. Since Stanley and Williamson’s preferred model is that of a Russellian proposition, we should stick to that model in what follows. But once the linguistic characterisation is voided, how are we supposed to interpret this natural construal of ‘contemplation’?

Not being linguistic items doesn’t undermine Russellian propositions’ main function. They are invoked only inasmuch as they can play a role in the explanation of a subject’s behaviour and, in order to play that role, the content of propositions has to be sensitive to the way an agent takes the world to be⁴. The connection between Russellian propositions and propositional attitude talk remains thus in place. A Russellian proposition can be the content of a subject’s thinking only inasmuch as it

constitutes a subject's reason for action. For propositions to be the complements of propositional attitudes such as believing or desiring, they must, at a minimum, enter in the explanation of why a subject acts in the way she does. The natural construal of 'contemplating p ' need not thus be understood as requiring the linguistic articulation of p or the tokening of a syntactically and semantically structured mental representation P , but it does require that the objects that figure as constituents of p can be used as reasons for actions.

A way of establishing whether the objects of thought do play this explanatory role is to present the speaker with a verbal report of the content of the proposition and see whether she recognises it as true. In the case of Stanley and Williamson, an indexical way of referring to an object or a property is all we need to check whether the subject does indeed possess this kind of propositional knowledge. It is not at all necessary that the subject can describe this propositional knowledge in nonindexical terms (cf. *op. cit.*, 433).

The take-home message from Ginet's passage, when applied to Stanley and Williamson's own proposal thus seems to be: we need not be currently aware of a proposition to warrant an ascription of knowledge-how. But, we must immediately add: if we count as contemplating a proposition at all —under the natural construal of 'contemplation'—, we'd better take the contents of our thoughts as providing a reason for our actions.

As we saw, to claim that Hannah *knows how* to ride a bicycle is to claim that Hannah *knows that* w is a way for her to ride a bicycle. Under the current interpretation, the truth of such a claim requires that Hannah engage in the intentional action of contemplating a proposition whose constituents are, among other objects and properties, Hannah herself and w —where the mode of presentation of w is practical. If Hannah is entertaining a proposition in the manner Stanley and Williamson seem to require (on the natural interpretation of entertaining a proposition), then Hannah must, among other things, be able to recognise w as being a way for her to ride a bicycle. It is not necessary that Hannah be able to formulate (in her mind or out loud) such a proposition, but it is necessary that Hannah be able to recognise the objects and properties that occur in that proposition as constituting the reasons why she acts in the way she does. This, of course, may simply mean that

Hannah would assent to a sentence containing just indexical expressions to refer to such objects and properties.

The minimum requirement thus seems to be that Hannah must be aware of herself and certain features in her environment, i.e., those relating to *w*'s practical mode of presentation, as involved in the explanation of her bicycle riding behaviour. These features may be processed unconsciously and may also, as pointed out earlier, not be currently available while Hannah engages in the action of riding a bicycle. Yet, it's only because Hannah is aware of how they bear upon what ought to be done to ride a bicycle that we can justifiably ascribe this kind of knowledge to her and that we can, ultimately, explain Hannah's action as being (in)appropriate or (un)successful.

Not all instances of knowledge-how, however, meet this minimum requirement. I would like to show that there are circumstances in which we feel intuitively justified in ascribing knowledge how to φ to subjects who not only do not, but actually *cannot* recognise the property of a way of φ -ing —not even under a practical mode of presentation. The presence of these cases puts Stanley and Williamson in a difficult position, namely, the position of having to withdraw ascriptions of knowledge-how in circumstances where they are intuitively granted.

The situations I have in mind relate to subjects whose visually guided action has been impaired due to severe trauma or pathological conditions brought on by injury or accidental exposure to neurotoxic substances. Two deficits are salient in this respect. One is optic ataxia, a neurological disorder that occurs when the patient can recognise objects but cannot reach them under visual guidance. The other is visual agnosia, characterised by the patients' inability to recognise objects with which they can nevertheless interact successfully⁵. This and other related phenomena have been the focus of some recent research by, among others, Milner and Goodale (1995, 2006. See also Goodale *et. al.* 1991). Their work is well known for having provided evidence supporting a 'dual stream' model of the human visual system. On the one hand, the dorsal stream seems to provide information for the guidance of skilled visuo-motor action. Optic ataxics, i.e. those patients who can recognize objects without any difficulty but are unable to act upon them —e.g., grasp the objects or orient themselves towards them— in any appropriate way, seem to have, according to Milner and Goodale, a damaged dorsal stream. On the other hand, the ventral stream —they claim— subserves conscious perceptual judgment. Visual agnosics, those

patients who fail to categorise their visual input, would thus be patients with a damaged ventral stream. These patients would be e.g. able to reach for a screwdriver with a beautifully calibrated grasp, even though they may very well pick it up at the wrong end, since they cannot identify it as an object with a particular function. Sometimes, as in the case of patient DF, these subjects do not seem to have conscious visual experience of the shape and orientation of objects at all, yet they can, in forced choice conditions, engage in action-oriented tasks with objects in ways that match control groups of normal-sighted subjects⁶. The case of DF is particularly relevant in showing the relative independence of these two visual pathways and how the visual system can unconsciously process information exclusively aimed at guiding skilled sensorimotor behaviour without the subject's recognition of any the objects involved. Most neuroscientists explain DF's ability to act in appropriate ways upon objects she cannot recognise by pointing to a damaged ventral stream and a perfectly healthy dorsal one⁷.

Cases such as DF's are clearly problematic given Stanley and Williamson's account of knowledge-how. DF has no conscious experience of the objects —*qua* objects— with which she can nonetheless engage in appropriate visuo-motor behaviour. She can perceive colours and blurred images, but these visual cues don't usually support recognition of the objects themselves. One of the best-known experiments involves DF and a circular piece of cardboard, in the centre of which there is a rectangular slot similar to those found in letter-boxes. The task consists in placing a letter through the rectangular letter-box. But the experimenter rotates the cardboard so as to change the orientation of the slot, which thus varies from horizontal to vertical to any intermediate position within the 360 degree circle. DF was, as in other similar situations, unable to consciously recognise any of the relevant properties involved in the task, e.g. the orientation of the slot. However, whenever she executed the required action, video recordings showed clearly that from the very instant in which she started to move, her hand movements as well as the rotation of her wrist and arm were all appropriate to the task of placing the letter through the oriented slot. She was as successful at this task as a control group of normal-sighted subjects. She knows-how —or so I'd suggest— to orient the letter for posting through the slot.

DF does not, of course, have a conscious visual experience of the shape of the slot or its orientation. She thus responds to her own success with no small amount of disbelief since she really doesn't experience the situation as one in which she can hope to achieve any such success⁸. DF's skilled action does not seem to draw upon any kind of fitting experiential content, i.e., she doesn't experience her unfolding action as being appropriate for success at the task⁹. Yet her sensorimotor behaviour is indistinguishable from that of a normal-sighted subject, i.e., most of the time she orients her hand in ways that perfectly track the slot. DF is thus *unconsciously aware*, courtesy of her intact dorsal pathway, of the relevant environmental features that guide her action. We could very well claim, without distorting the semantics of the expression, that DF just *knows how* to place a letter through a letter-box slot. But suppose we apply Stanley and Williamson's apparatus to this case? The explanation of DF's behaviour would have to be in the following terms: DF knows how to φ (place a letter through an oriented rectangular slot) because she entertains the proposition that w is a way for her to φ . W must thus *appear to* DF as being a way to φ , and DF must grasp this property as bearing upon what ought to be done to φ . However, DF couldn't possibly entertain such a proposition because she cannot grasp one of its constituents — she cannot perceive the features, e.g. the orientation, that govern her motor behaviour in the posting task, and hence couldn't recognise them as in any way constituting a reason for her action. DF lacks the kind of phenomenal experience that would underwrite an appreciation of her own behaviour as suited to solving the problem.

This lack of phenomenal appreciation becomes more relevant when we consider the strategy followed by Stanley and Williamson in discussing the idea of a *practical* mode of presentation of the property of being a way of engaging in action. The dialectic here consists in running a parity argument between practical and first-person modes of presentation (*op. cit.*, 429):

Giving a nontrivial characterization of the first-person mode of presentation is quite a substantial philosophical task. Unfortunately, the same is true of giving a nontrivial characterization of a practical mode of presentation of a way. In both cases, however, one can provide an existence proof for such modes of presentation. If, as is assumed in much of philosophy of language, there is a

sound argument from (26) [John believes that that man has burning pants] to (27) [John believes that he himself has burning pants] to the existence of first-personal guises of propositions, then there is a sound argument from (28) [Hannah knows that that way is a way for her to ride a bicycle] to (29) [Hannah_i knows [how PRO_i to ride a bicycle]] to the existence of practical guises of propositions.

The reflexivity expressed through first-person propositional-attitude ascriptions clearly requires the subjects involved to be aware of themselves as being the recipient of such ascriptions. It requires that the subjects understand how the features and properties of the situation affect them. One does not even need to accept heavy-duty self-ascription theories of the kind advanced by Chisholm (1981) or Lewis (1979) to acknowledge that the difference in truth-value between (26) [John believes that that man has burning pants] and (27) [John believes that he himself has burning pants] must be accounted for in terms of John being able to perceive himself as the one who is in danger, i.e., as John having an appreciation of how the property of having burning pants affects *him*. We should thus expect any sound argument taking us from (26) to (27) to reflect this fact.

Since the transition from a demonstrative to a practical mode of presentation when discussing Hannah's propositional knowledge of a way to ride a bicycle is presented as following the same pattern as the transition from a demonstrative to a first-person mode of presentation, we should also expect Hannah to have an appreciation of how the properties of the objects involved in the bicycle riding task affect *her* performance. Stanley and Williamson's semantic interpretation of the empty pronominal element (PRO) occurring in the subject position of infinitives in English seems to support this claim (cf. *op. cit.*, 425). According to them, when we say that Hannah knows how to ride a bicycle, we claim that Hannah knows that there is a way *for her* to ride a bicycle. Yet, if this line of argument is right, DF's performance becomes all the more relevant as a problem case for Stanley and Williamson's view of knowledge-how, since DF has no perceptual experience of the shape or orientation of the slot and, *a fortiori*, is not aware of herself as performing in any way appropriate to success in a task involving those features, even though we can justifiably —or so I suggest— claim that she knows how to do it¹⁰.

Of course, Stanley and Williamson could now opt for the other interpretation of what entertaining a proposition might consist in vis-à-vis characterising instances of knowledge-how. They could —as we saw— take the act of entertaining a proposition to be a non-intentional, sub-personal, act. It is to this possibility that I now turn.

Contemplating a proposition: a sub-personal analysis

The possibility of considering the act of entertaining a proposition a non-intentional act is introduced as an attempt to rescue the truth of premise (2) [“if one employs knowledge that p , one contemplates the proposition that p ”] in Stanley and Williamson’s reconstruction of Ryle’s argument (*op. cit.*, 415-416):

... we can rescue premise (2) from Ginet’s objection by denying that ‘contemplating a proposition’ should be taken in its intentional action sense in premise (2). Perhaps there is a sense of ‘contemplating a proposition’ in which it refers to an action that is no more intentional than is the action of digesting food. Or perhaps it can also be construed as denoting an action merely in some deflationary sense of ‘action’. If ‘contemplating a proposition’ is taken in such a sense, then premise (2) can be salvaged after all.

The essential feature of this interpretation is to characterise the act of contemplating a proposition as purely mechanical. If we go back to Ryle’s argument with this in mind, premise (2) would be true, but unfortunately —Stanley and Williamson argue— any attempt to draw Ryle’s intended conclusion would then face an obvious fallacy of equivocation since the actions that make premise (1) true are of the intentional kind. If to contemplate a proposition is not an intentional action, then it cannot be a substitution instance for ‘ φ ’ in premise (1), and thus the argument avoids Ryle’s suggested infinite regress.

Interestingly though, neither Ryle nor, I trust, anyone else would be tempted by this construal of ‘contemplation’ since the act of digesting food —like any act that is the result of the mechanical operation of sub-personal mechanisms— can hardly be considered a good candidate when discussing matters of agency. However, there may

be a more interesting reading of this type of proposal. It seems possible, for instance, to maintain the spirit of the suggestion but to shift the focus to a type of sub-personal event that —unlike digesting food— is susceptible of being modified by way of training. The movements involved in e.g. the act of hitting a golf ball or in swimming are examples of this kind. When thus considered, we enter an interesting realm. On the one hand, it makes sense to talk about e.g. swimming as being an intentional action, subject to the usual constraints of the intentional sphere. Yet, the practice of swimming doesn't really consist in the practice of this intentional action. It consists rather in the attempt to fine-tune the otherwise unconscious constituent acts involved in such an activity, such as breathing rhythms, arm movements, angles at which to hit the water, etc. (cf. Roland 1958, 382). These basic acts would —if the training is successful— become again automatic, thus re-joining the sub-personal and unconscious domain to which they belong, only modified and fine-tuned this time as a result of the process of learning and / or training.

Had Stanley and Williamson pursued this alternative version of their proposal when analysing Ryle's argument, they might have found their diagnosis of equivocation far less appealing¹¹. Our purpose here, however, is rather to discuss what would happen to their own positive view if, as suggested, the act of contemplating a proposition is considered to take place at the sub-personal level, yet, as a result of learning and / or training, it is sensitive to the subject's intentional projects.

If Hannah knows how to ride a bicycle (φ), she does so —according to Stanley and Williamson— because she entertains the proposition that w is a way for her to φ . On this new interpretation, for Hannah to entertain such a proposition is for her sub-personal mechanisms to be causally connected in the required manner to the relevant environmental features after a certain period of training. What about DF and her preserved ability to place a letter through a rectangular slot in a variety of orientations? Suppose that, as we did before, we grant the truth of Stanley and Williamson's claim that if DF knows how to place a letter through the slot it is because she entertains the proposition that w is a way for her to place a letter (φ). Unlike under the previous interpretation, there is now no problem in ascribing to DF a kind of knowledge-how. We are justified in claiming that DF knows how to post a letter through a rectangular slot since all that is required on this interpretation is for the visual inputs to DF's healthy dorsal stream to provide enough information for

coding orientation and shape, all of which could perfectly be done via DF's unimpaired visual mechanisms such as V1 or the collicular-thalamic route. DF has no conscious awareness of this visual information and has no phenomenal experience as to the appropriateness of her own performance, but she has proprioceptive awareness of the features that govern her visually guided action in this particular task. DF's unimpaired dorsal pathway is working on her behalf as a sub-personal proposition-consumer.

But, what does 'proposition' mean here? Explaining Hannah's and DF's cases in this way threatens to make us lose our grip on what propositional knowledge is. After all, a proposition is a structurally complex syntactic entity with a semantic content. It is an abstract, intentional, object toward which a subject could have different attitudes. Causal relationships supported by sub-personal mechanisms, by contrast, need be neither syntactically structured nor symbolic. Even a Fodorian appeal to sentences in a language of thought acting as intermediaries between intentional subjects and the proposition they entertain would fail to work in this context. There is no central processing here, nothing that bears any resemblance to the process of contemplating an abstract object. Especially in the case of DF, what's doing the work is an egocentric action field which channels information in a way relevant only for supporting visually guided action. Hence, it wouldn't make much sense to claim that to know-how is a species of *propositional* knowledge when propositions appear to be just pieces of proprioceptive information with no epistemic value, and the act of grasping such information occurred at the sub-personal level. In conceptualising the act of entertaining a proposition as a sub-personal act of *this* kind, we thus seem to fail to demarcate any clear class of cases as failing under the notion of propositional knowledge.

Of course, one could question the role of examples like DF in our discussion of Stanley and Williamson's account. The most obvious objection would seem to be that DF's ability does not count as an instance of know-how. In fact, that would probably be Stanley and Williamson's natural line of response since they deny that one knows how to ϕ if and only if one can ϕ and hence are free to allow that DF can ϕ without taking her ability to be knowledge at all. However, we could agree with Stanley and Williamson about the need to differentiate between the properties of being able to ϕ and knowing how to ϕ without necessarily taking DF as merely

instantiating a property of the first kind. One could stop this move based on e.g. considerations about DF's reliable, consistent and successful performance (see below)¹². It is DF's dramatic impairment that ultimately seems to be behind the reluctance to take DF's ability as a case of knowing-how. After all DF is a classic example of a visual form agnostic, someone with a damaged occipital lobe¹³. As a result of this, hers —it could be argued— is a pathological case of questionable relevance. The fact that she displays normal visuomotor behaviour regarding this particular task¹⁴, even though she has no conscious experience of any of the relevant features for doing so¹⁵, should not incline us to conceptualise her action as manifestations of knowledge. At the very least —the critic would continue— it is not clear what our intuitions ought to be and there are certainly sufficient disanalogies between DF's circumstances and other typical knowledge-how cases to rule out its relevance as a counterexample to Stanley and Williamson's view.

But, are there? Assuming —as we are doing— the truth of Milner and Goodale's hypothesis, it is in fact DF's damaged ventral pathway that ultimately accounts for this cognitive deficit¹⁶. Let's then imagine for a moment that DF's ventral pathway began to process visual information again in the usual way. Would this restoration be sufficient for turning DF's letter posting ability into a standard case of knowing-how? This certainly would seem to be what our critic has in mind. Once the injury had disappeared, and with it the perceptual impairment it caused, it would then make sense to think of DF's ability as a good example of knowing how to post a letter. So, what does adding a healthy ventral stream do for DF's knowledge regarding this particular task?

Under our favoured hypothesis, the main difference is that DF's healthy doppelganger would now be able to *perceive* the shape and orientation of the box. Remember that we are talking about visual pathways running between the retina and two different regions of the brain. The dorsal pathway connects V1 to the posterior parietal cortex —the brain area for motor control. That, of course remains in place. The ventral stream runs from the primary visual cortex (V1) to the infero-temporal cortex —the conceptual and language processing area of the brain. It is considered to be responsible for the subject's recognitional and classificatory abilities in visually guided action. So a healthy ventral stream means that DF's doppelganger now has the ability to identify and classify shapes and orientations. DF's healthy doppelganger

would thus have recovered a minimal set of recognitional capacities, i.e. she would now be able to identify such-and-such shape as rectangular and such-and-such orientation as being at n degrees, which, allegedly, would allow her to accommodate the angle and rotation of her hand so as to be successful at this task. It would make sense to claim in this context that there is a way w for DF to post a letter and that DF grasps the property of w appearing to be thus-and-so based on her being able to perceive e.g. the box being rectangular and at 45 degrees right. However, and interestingly, what is most characteristic about knowing-how cases, about someone who e.g. knows how to place objects through different shaped slots, is not that they can identify, or in any way classify the environmental properties that make their actions successful¹⁷. What matters most in these cases is that the subjects can consistently and reliably perform a task better than chance under variable circumstances and do so without being driven by conceptual or linguistic resources.

I suggest that DF knows how to post a letter not because she is able to articulate her knowledge or identify the relevant properties of the objects involved in such an action. She knows how to post a letter because she reliably, consistently and successfully engages in this action based on the processing of proprioceptive, goal-directed information. This doesn't mean, of course, that her action ought to be considered mechanical or placed outside the arena of intentionality. First of all, her behaviour is elicited by trying to comply with a request —in the case of DF's forced choice scenario— or just by the desire to post a letter —in the case of DF's healthy doppelgänger or the contemporary DF now fully acclimatised to her preserved abilities. Secondly, DF's behaviour is the result of learning. Granted that it may be the kind of learning that proceeds without the formulation of rules, but it is nevertheless governed by them. Typical cases of knowing-how are precisely those in which successful action has priority over descriptive and classificatory abilities of any kind and where recognition and generalisation play a much less important role.

It thus looks like those who object to the appropriateness of DF as a counterexample to Stanley and Williamson's view based on the rarity of her case should to re-think their position, since perfectly normal subjects —i.e., subjects without this particular cognitive impairment— seem to rely on the same kind of proprioceptive —not propositional— information as does DF. A healthy ventral pathway doesn't seem to contribute in any significant way to changing the nature of

DF's relevant processing of information. What DF does for us is to bring to the fore what is true even in normal subjects, i.e, the fact that we are able to act upon objects in skilful ways that are quite independent of propositional corseting. I would thus like to spend the last section of this paper discussing, albeit briefly, the positive idea that knowledge-how requires a certain kind of expertise.

Knowing-how and expertise

According to Stanley and Williamson, it's incorrect to analyse knowledge-how in terms of abilities. Knowledge —knowledge of all kinds— is propositional. We may not be currently aware of lots of propositions, but under certain favourable circumstances, we can retrieve those propositions from memory, even if, as in the case of knowing-how, those propositions contain as one of their constituents just an indexical reference to a way of doing something.

For Hannah to know how to ride a bicycle, in certain favored circumstances, she must be able to retrieve some propositions expressed by sentences of the form 'w is a way for Hannah (herself) to ride a bicycle'. The favored circumstances may include sitting on a bicycle, and Hannah can retrieve the proposition without being able to express it in nonindexical words (*op. cit.*, 440).

Stanley and Williamson's view thus clearly belongs to the intellectualist tradition Ryle was trying to criticise. We can say of a subject that she knows how to fit pegs of different shapes into appropriately shaped holes because she is in command of at least a minimally articulate and conceptualised understanding of the situation. If asked why she expected a peg to fit through a particular hole, she may appeal, for example, to *the way* the peg looked to her. The reasoning-weighted role of indexicals in a subject's explanation of her knowledge-how seems thus to be essential in the characterisation of knowledge-how as propositional. Grasping a proposition requires the subject to appreciate a suitable connection between the proposition itself and the subject's reasons for entertaining it. So, for Stanley and Williamson, it's propositions all the way down.

However, it is quite a common feature of standard repertoires of knowledge-how that subjects are not aware of their reasons for φ -ing, in the way they do, even when asked. In a large number of cases, we seem justified in ascribing knowledge-how to subjects who are incapable of articulating, or in any other way recognising, their reasons for φ -ing in the way they do. Such a justification does not depend on there being reasons in place. The requirement seems to be much weaker and it could be cashed out in terms of success. If S knows how to φ , then she knows that —in certain favoured circumstances— she will succeed at φ -ing if she tried (cf. Hawley 2003; Young 2004).

That ascriptions of knowledge-how are warranted only when a subject's performance reaches certain standards of efficiency or success brings to the fore a second and more important feature of these cases. Achieving the necessary proficiency is usually the result of a non-insignificant amount of training. We talk about e.g. knowing how to knit, how to cook, how to swim, how to play golf, how to fix the sink, how to behave in church. All those activities require the development of a certain technique through time. They involve diachronic episodes in which practice has played a major role. Of course, very simple actions may require very little time to become an expert at (e.g. posting a letter), but even those aspects of our cognitive lives that seem more basic (knowing how to walk, knowing how to obey an order) are mostly the result of some form of training. The process of learning begins at the moment we engage or are exposed to a particular activity for the first time, it continues through different stages of apprenticeship, and it (if successful) ends in expertise. It is also part of what it takes to be an expert to be able to recognise which ways of φ -ing are the best to attempt to pick up through this process of training.

If knowledge-how were just a species of propositional knowledge, shouldn't we be able to acquire it in the synchronic fashion typically associated with propositional knowledge? Wouldn't we count as knowing how to do certain things — e.g. play golf— on the spot, as it were, i.e., as soon as we synchronically grasped a proposition one of whose constituents was *a way of playing golf*¹⁸? How could entertaining a proposition one of whose constituents is *a way of playing golf* either constitute or entail my knowing how to do it? Instead, I need to be an expert of sorts. To be an expert at e.g. playing golf is to be able, under certain circumstances, and without any further training, to automatically adjust and respond appropriately to all

kinds of variations and difficulties as presented by the game. What golf training does is to change the functional poise of certain perceptual inputs by engendering a skill that allows the subject to automatically and unreflectively make certain body, grip and balance adjustments such as may promote a successful, efficient —and, ideally, legal— way of getting the ball to the green. The expert golf player, who knows how to hit the green of a par-3 hole by hitting the ball far up into the air and 200 yards across the middle of the fairway, knows how to do so as a result of practice. She has learnt to make the stance, muscular and proprioceptive adjustments required to cope with situations of this kind. Also, and importantly, she has learnt to unconsciously and automatically recognise which situations require which type of adjustment.

What learning and practice typically do for us —that the mere act of entertaining a proposition cannot do¹⁹— is to support the fine-tuning of the many sub-personal mechanisms involved in skilled activities. That such sub-personal mechanisms *can* be tuned via deliberate learning allows the sub-personal bedrock to respond, albeit only indirectly, to rational —and thus intentional— demands. Stanley and Williamson’s view of knowledge-how as propositional all the way down loses sight of all this and leaves us with no understanding of two essential features of knowledge-how. First, that it can be justifiably ascribed in the absence of the appreciation of reasons and second, that it can be justifiably ascribed only when skilled behaviour approaches a certain level of competence.

NOTES

- ¹ Russellian propositions are the preferred model in the paper but the authors claim their analysis does not depend on this particular choice. Any of the standard theories of the semantics of propositional-attitude ascriptions would do the job.
- ² Regardless of any particular view concerning the semantic import of modes of presentation. If modes of presentations are semantically relevant —i.e., if they contribute to the truth conditions of a corresponding attitude ascription—, the actual entertainment of a proposition under a practical mode of presentation is required. If modes of presentation are not semantically relevant, then entertaining a proposition under a practical mode of presentation is not

required as such, but is shown to be present through pragmatic considerations. Stanley and Williamson remain neutral on this issue.

³ Karttunen's (1977) theory.

⁴ In fact, we only give up the requirement of connecting specifications of content to reasons for action, in this sense, when we adopt a view of propositions as functions from possible worlds to truth-values —as it is done in possible worlds semantics. On any other view —Fregean or Russellian— the content of propositions has to be connected to the way in which an agent represents the world. Otherwise, it would fail to have any explanatory role regarding the agent's behaviour.

⁵ Sometimes visual agnostics can actually recognise objects or even describe them through other senses, like sound or touch. Colours associated with certain objects can also help identification.

⁶ As we pointed out earlier, visual agnostics like DF can nevertheless perceive colours and textures. Inasmuch as colours could get associated to certain objects, it would be correct to say that DF has a certain residual visual experience of objects. But only in that indirect sense.

⁷ There has been a heated debate recently as to which exactly are the roles of the ventral and dorsal streams. In particular Pisella and colleagues (Pisella *et al.* 2000), Rossetti, Pisella, and Vighetto (2003), and Rossetti and colleagues (Rossetti *et al.* 2005) revisit the role of the ventral and the dorsal visual streams so as to question the assimilation of this anatomical distinction to the distinction between perception and action. They argue that there is indeed insufficient evidence to argue for this dissociation on the basis that optic ataxia (the 'complimentary' of DF's visual agnosia) appears to be a phenomenon that takes place only when subjects reach for an object into the periphery of their visual field or when there has to be some subtle correction of the reaching movement as a consequence of the target object having moved in some way. They also claim —against Milner and Goodale— that both the selection of action and the initial motor programming of heading may be carried out by the ventral stream. Milner and Goodale disagree about these results and provide further evidence to show that optic ataxics are indeed impaired at the level of initial motor behaviour, even though —they

acknowledge— there may be two different subsystems operative within the dorsal stream (Milner and Goodale 2006, 237-238). To be clear, we are presenting DF's case on the assumption that Milner and Goodale's interpretation is correct.

8 Although DF has actually gained confidence in such classes of actions over the years (Goodale and Milner 2004). We can now say that she herself feels that she knows how to perform the tasks —rather as we might feel we know how to perform a slip-catch in cricket: an action too fast, too dorsally dominated, for conscious perceptual guidance or monitoring.

9 Cf. Young (2004, 42-43).

10 We thus agree with Young (2004) that attributions of knowledge how to φ need not make reference to a subject's performance 'feeling right' as a consequence of her phenomenal experience while φ -ing.

11 Noë (2005) recommends a similar way of downplaying the success of Stanley and Williamson's criticisms of Ryle's view. Noë's suggestion in order to re-establish the grounds for Ryle's argument is to consider the act of contemplating a proposition intentional yet unconscious. Our suggestion is rather to locate the act of contemplating a proposition at the sub-personal level, thus making it unconscious, but making it intimately connected to the intentional sphere through processes of learning and / or training.

12 For a more detailed argument attempting to show that this line of response would not succeed, see Noë (2005).

13 Her lateral occipital cortex, in particular, shows bilateral necrosis as a result of carbon monoxide poisoning.

14 DF is not only good at posting letters, she can also reach for objects of all kind of shapes and is perfectly capable of e.g. catching a ball. Of course, DF's precision in real-time grasping tasks doesn't make her general sensorimotor behaviour indistinguishable from that of a normally sighted person. She completely fails when asked e.g. to simulate grasping an object to which she was exposed only 2 seconds earlier (cf. Goodale, Jakobson, and Keillor 1994).

15 DF can perceive colour and texture and thus recognise objects based just on these properties (Humphrey *et al.* 1994). However, these are not parameters

that play any role in DF's success at posting a letter through a rectangular box, our central case.

¹⁶ Recent high-resolution functional MRIs studies of brain functionality in DF have also come to support it (cf. James 2003).

¹⁷ Even if DF became a normal subject, it would still be true that her posting the letter through the letter-box wouldn't probably be guided by her conscious visual attention, but by the unconscious processing of information that takes place at the dorsal stream.

¹⁸ Of course, some propositional knowledge can also be the result of having being exposed to a succession of experiences or having been trained in a particular subject (think of mathematics), but although training and/or exposure to experiences may have been involved in the knowledge of such facts, such an effort is not essential to our knowing them.

¹⁹ This is possibly a contingent fact about human brains and human learning (cf. Lewis 1990).

CV

Josefa Toribio's research is located at the intersection of philosophy of mind, philosophy of science, and cognitive science. She has published papers in these areas for, among others, *Philosophy and Phenomenological Research*, *Synthese*, *Consciousness and Cognition*, *Philosophical Issues*, *Philosophical Papers*, *Pragmatics and Cognition*, *Minds and Machines*, *Theoria*, and *Phenomenology and the Cognitive Sciences*. Currently she is exploring the conceptualism vs. nonconceptualism debate as it arises at the intersection between scientifically informed Philosophy of Mind / Cognitive Science and what might be dubbed the "normative image" of mind. She joined the Department of Philosophy at the University of Edinburgh in August 2004, having previously held positions at the School of Cognitive and Computing Sciences, University of Sussex, Washington University in St Louis, and Indiana University. Address: Department of Philosophy, University of Edinburgh, David Hume Tower, George Square, Edinburgh EH8 9JX, Scotland, UK. Email: j.toribio@ed.ac.uk.

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