

NOT-EXACT-TRUTHS, PRAGMATIC ENCROACHMENT AND THE EPISTEMIC NORM OF PRACTICAL REASONING

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ABSTRACT: Recently a number of variously motivated epistemologists have argued that knowledge is closely tied to practical matters. On the one hand, radical pragmatic encroachment is the view that facts about whether an agent has knowledge depend on practical factors and this is coupled to the view that there is an important connection between knowledge and action. On the other hand, one can argue for the less radical thesis only that there is an important connection between knowledge and practical reasoning. So, defenders of both of these views endorse the view that knowledge is the norm of practical reasoning. This thesis has recently come under heavy fire and a number of weaker proposals have been defended. In this paper counter-examples to the knowledge norm of reasoning will be presented and it will be argued that this view – and a number of related but weaker views – cannot be sustained in the face of these counter-examples. The paper concludes with a novel proposal concerning the norm of practical reasoning that is immune to the counter-examples introduced here.

KEYWORDS: pragmatic encroachment, practical reasoning, approximate truth, knowledge

1. Introduction

Recently a number of variously motivated epistemologists have argued that knowledge is closely tied to practical matters – let us refer to them here as the *encroachers* and to their view as *pragmatic encroachment*.¹ The most radical versions of this view are proposed as alternatives to epistemological views that are versions of intellectualism.² Intellectualists hold that knowledge does not depend in any way on practical factors and intellectualism is both deeply and commonly

¹ Of course various proponents of classical pragmatism such as William James, C.S. Peirce and F. P. Ramsey have also suggested related views previously. In particular, they variously suggested pragmatic views of belief where belief is intimately tied to action. However, these more historical views are not the topic of this paper and they will be ignored in what follows. See Michael Shaffer, “The Ramsey Principle and the Principle of Informational Equilibrium,” *The Reasoner* 5 (2011): 37-39 for a related criticism of pragmatic theories of belief.

² The term ‘intellectualism’ originated with Earl Conee according to Jason Stanley, *Knowledge and Practical Interests* (Oxford: Oxford University Press, 2005), 6.

held by epistemologists. Nevertheless, those who defend radical forms of pragmatic encroachment reject intellectualism and hold that what counts as knowledge depends in some important sense on practical factors. This version of the view is then a serious challenge to a widespread and deep orthodoxy in epistemology and the sorts of cases that motivate radical encroachers are cases where it is supposed that what an agent is doing has significance with respect to what they know. This is primarily because of what is supposed to be at stake in those cases. What radical encroachers claim is that by examining pairs of cases that differ only in terms of the stakes involved, we can see that such variation results in knowledge being present or absent.³ Radical encroachers believe that the analysis of knowledge itself is infected by pragmatic concerns. Let us examine one such infamous pair of cases as presented by Jason Stanley to see this point that is so crucial to the radical encroacher's view:

HANNAH AND SARAH 1: Hannah and her wife Sarah are driving home on a Friday afternoon. They plan to stop at the bank on the way home to deposit their paychecks. It is not important that they do so, as they have no impending bills. But as they drive past the bank, they notice that the lines inside are very long, as they often are on Friday afternoons. Realizing that it isn't very important that their paychecks are deposited right away, Hannah says, "I know the bank will be open tomorrow, since I was there just two weeks ago on Saturday morning. So we can deposit our paychecks tomorrow morning."⁴

HANNAH AND SARAH 2: Hannah and her wife Sarah are driving home on a Friday afternoon. They plan to stop at the bank on the way home to deposit their paychecks. Since they have an impending bill coming due, and very little in their account, it is very important that they deposit their paychecks by Saturday. Hannah notes that she was at the bank two weeks before on a Saturday morning, and it was open. But, as Sarah points out, banks do change their hours. Hannah says, "I guess you're right. I do not know that the bank will be open tomorrow."⁵

Radical encroachers claim that Hannah knows that the bank will be open tomorrow in the first case, but not in the second, and that this is because of the difference in the practical interests of the agents in the two cases. So on this view, whether an agent knows is then not just a matter of non-practical factors and whether one knows depends on what interests one has.⁶ More specifically, in low

³ Kvanvig concurs about this analysis of the encroacher's strategy in this respect in Johnathan Kvanvig, "Against Pragmatic Encroachment," *Logos & Episteme* 2 (2011): 77-85.

⁴ Stanley, *Knowledge and Practical Interests*, 3-4.

⁵ Stanley, *Knowledge and Practical Interests*, 4.

⁶ Jonathan Hawthorne, *Knowledge and Lotteries* (Oxford: Oxford University Press, 2004), Stanley, *Knowledge and Practical Interests*, Jonathan Hawthorne and Jason Stanley,

stakes situations knowledge is taken to be more prevalent than in higher stakes situations. As the pair of examples then shows, radical encroachers believe that two agents can be in epistemically similar situations qua their evidence, psychological situation and beliefs, while differing with respect to what they know because of the stakes involved and because of what they are doing. Such radical versions of pragmatic encroachment then also give rise to the additional view that knowledge is intimately connected to practical reasoning and action. So on this sort of view knowledge is closely related to action via the stakes dependence of knowledge itself and one ought only to act on (or deliberate using) what one knows.⁷

However one can defend the view that one ought only to act on (or deliberate using) what one knows without committing one's self to pragmatic encroachment. On the one hand, pragmatic encroachment is the view that facts about whether an agent has knowledge depend on practical factors and this is coupled to the view that there is an important connection between knowledge and action.⁸ Typically this amounts to the claim that knowledge has intrinsically pragmatic content and that this needs to be reflected in the analysis or characterization of knowledge itself. On the other hand, one can argue there is an important connection between knowledge and practical reasoning in the sense that knowledge is the norm of practical reasoning without arguing that this needs to be reflected in the analysis or characterization of knowledge.⁹ What is most important here is that the defenders of both of these views endorse the view that knowledge is the norm of practical reasoning. That is to say that all of these views involve accepting that claim that one should depend on a proposition is practical reasoning if and only if it is known. This thesis has recently come under heavy fire and a number of weaker proposals have been defended. In this paper counter-

"Knowledge and Action," *The Journal of Philosophy* 105 (2008): 571-590, Timothy Williamson, *Knowledge and its Limits* (Oxford: Oxford University Press, 2000), Timothy Williamson, "Contextualism, Subject-Sensitive Invariantism and Knowledge of Knowledge," *The Philosophical Quarterly* 55 (2005): 213-235 and Jeremy Fantl and Matt McGrath, *Knowledge in an Uncertain World* (Oxford: Oxford University Press, 2009) are all defenses of versions of pragmatic encroachment.

⁷ See for example Hawthorne, *Knowledge and Lotteries*, 30 and Stanley, *Knowledge and Practical Interests*, 8-12.

⁸ John Hawthorne, Jason Stanley, Jeremy Fantl and Matthew McGrath are encroachers of this sort.

⁹ Timothy Williamson appears to be an encroacher of this sort, particularly because he believes that knowledge is not analyzable. This is of course expressed by his infamous endorsement of the E = K thesis. See Williamson, *Knowledge and its Limits* and Patrick Greenough and Duncan Pritchard, *Williamson on Knowledge* (Oxford: Oxford University Press: 2009).

examples to the knowledge norm of reasoning will be presented and it will be argued that this view – and a number of related but weaker views – cannot be sustained in the face of these counter-examples. The paper concludes with a novel proposal concerning the norm of practical reasoning that is immune to the counter-examples introduced here.

2. Pragmatic Encroachment and the Knowledge Norm of Practical Reasoning

There are a number of specific versions of the knowledge norm of practical reasoning, but the versions defended by Timothy Williamson and by John Hawthorne and Jason Stanley are perhaps the most well-known and influential. Hawthorne and Stanley are proponents of the typical form of strong pragmatic encroachment discussed above, whereas Williamson is a proponent only of the knowledge norm of practical reasoning. So they all share in common the view that knowledge is the norm of practical reasoning. In adopting this view Williamson and Hawthorne and Stanley have independently endorsed what amounts to the following thesis:¹⁰

(KNPR) $K_{sp} \equiv$ it is rational for S to employ p (appropriately) in S's practical reasoning.¹¹

To support this attribution one need only look at the following rather straightforward claims to this effect. Williamson claims that, "...one knows q iff q is an appropriate premise for one's practical reasoning."¹² Hawthorne and Stanley similarly claim that, "Where one's choice is p-dependent, it is appropriate to treat the proposition that p as a reason for acting iff you know that p."¹³ So, all three are all encroachers in this sense and the attribution of KNPR to them appears to be correct. Of course, this means that its being rational for S to employ p (appropriately) in S's practical reasoning is both a necessary and sufficient condition for S's knowing that p. So, we can represent the necessary condition component of the view easily and conveniently as follows:

(KNPR-N) It is rational for S to employ p (appropriately) in S's practical reasoning $\rightarrow K_{sp}$.

¹⁰ See Williamson, "Contextualism, Subject-Sensitive Invariantism," Hawthorne and Stanley, "Knowledge and Action," Williamson, *Knowledge and its Limits*, Hawthorne, *Knowledge and Lotteries*, and Stanley, *Knowledge and Practical Interests*.

¹¹ Lackey refers to this general view as the knowledge norm of practical reasoning (KNPR) in Jennifer Lackey, "Acting on Knowledge," *Philosophical Perspectives* 24 (2010): 361-382. This usage will be followed here.

¹² Williamson, "Contextualism, Subject-Sensitive Invariantism," 231.

¹³ Hawthorne and Stanley, "Knowledge and Action," 578.

Of course, one might immediately take issue with KNPR (and hence with KNPR-N) by noting that what counts as ‘rational’ with respect to practical reasoning and what counts as ‘appropriate’ use(s) of p are controversial matters to say the least. However, here KNPR will be challenged by presenting a perfectly clear and potent counter-example to the claim that S ’s knowing that p is a necessary condition for it to be rational for S to employ p (appropriately) in S ’s practical reasoning – that is to say, KNPR will be challenged by producing a clear counter-example to KNPR-N. What will make this even more telling as a counter-example is that the case involved does not solely turn on the degree to which the agent is justified in believing the relevant proposition(s) in the case in question and the case has little or nothing to do with the stakes involved. But, first we need to consider two clarificatory points about the pragmatic encroachers’ views with respect to KNPR.

First, it is important to note the qualification concerning p -dependence that Hawthorne and Stanley impose on their version of KNPR.¹⁴ This condition is imposed in order to allow them to deal with certain problematic counter-examples to the knowledge norm of practical reasoning involving acting on the basis of irrelevant propositions. For Hawthorne and Stanley a choice between options $\{o_1, o_2, \dots, o_n\}$ is *p-dependent* if and only if the most preferable of $\{o_1, o_2, \dots, o_n\}$ given proposition p is not the same as the most preferable option given the proposition $\neg p$.¹⁵ Most defenders of the knowledge norm have then followed Hawthorne and Stanley in imposing this qualification on KNPR in order to deal with those sorts of counter-examples, and so it has become a canonical element of the general view.

Second, let us say a little more about KNPR and the relevant concept of appropriateness that it assumes. As Jennifer Lackey has recently pointed out, what the defenders of KNPR are specifically interested in is *epistemic* appropriateness, as opposed to moral appropriateness, societal appropriateness, etc.¹⁶ So, she characterizes the knowledge norm view generally as follows:

It is epistemically appropriate for one to use the proposition that p in practical reasoning if and only if one knows that p .¹⁷

So she essentially attributes KNPR, and thereby KNPR-N, to the encroachers as well, but makes an important additional clarification of their view. Lackey’s characterization is then particularly instructive in this respect because it specifies the particular sense of appropriateness assumed in KNPR and KNPR-N (i.e.

¹⁴ Hawthorne and Stanley, “Knowledge and Action.”

¹⁵ See Hawthorne and Stanley, “Knowledge and Action,” 4.

¹⁶ Lackey, “Acting on Knowledge.”

¹⁷ Lackey, “Acting on Knowledge,” 1.

epistemic appropriateness). So, we can make this explicit as follows. Where the choice is p-dependent,

(KNPR') $K_{sp} \equiv$ it is *epistemically* rational for S to employ p (appropriately) in S's practical reasoning.

And we can do the same thing with PE-N as follows. Where the choice is p-dependent,

(KNPR-N') It is *epistemically* rational for S to employ p (appropriately) in S's practical reasoning $\rightarrow K_{sp}$.

This too has become a component of the canonical general version of KNPR.

3. Two Counterexamples to KNPR

Having made this point, let us now turn to developing the promised counterexample.

ROBIN 1: suppose that Robin is an independently wealthy advanced physics student studying relativistic mechanics at M.I.T. in 2009 and who is totally ignorant about archery. Nevertheless he believes that the laws of Newtonian mechanics are false and he knows that he believes this. Suppose then that Robin has been offered a fairly standard sort of performance wager. The terms of the wager are as follows. Robin will be given a bow and arrow, although Robin has never previously used this bow or one of its type. Nevertheless, he is aware of the strength of the bow and is assured that it is perfectly functional, that the arrow is perfectly normal and that anyone can use it effectively without training. He is also allowed to train as much as he likes. Robin is asked to put up \$50, and provided he can shoot an arrow beyond a marker set at 30 yards he will win \$100. If he fails to do so, then he loses the \$50 he put up. So, Robin must use his practical reason to determine whether he should accept the wager or not. Initially, given his ignorance of archery, he has no idea whether the bow is capable of shooting an arrow beyond the marker. But recall that Robin is a physics student and so let us suppose that Robin quickly remembers Newton's laws of force and motion and so easily calculates that given the strength of the bow and a reasonable angle of trajectory, the arrow will travel at least 100 yards. So, Robin completes his practical deliberation, accepts the wager and proceeds to win, thus doubling his stake.

Now, it should be patently clear that Robin's behavior is *epistemically* rational given virtually any standard of epistemic rationality. Robin deliberates about accepting the wager in a perfectly rational manner on the basis of propositions that it is perfectly rational for him to employ and draws the perfectly reasonable conclusion that he should accept the wager. He is also fact successful in his acting on the basis of his reasoning to this effect. But, in the course of Robin's

practical reasoning, he depends essentially on a number of propositions that are constitutive of Newtonian mechanics (i.e. Newton's laws of force and motion). Of course, we (and *ex hypothesi* Robin) know that these propositions are only approximately true.¹⁸ Newton's laws only hold (approximately) for cases where the velocities involved do not approach the speed of light. In reality, we (and *ex hypothesi* Robin) are aware that, properly speaking, relativistic mechanics describes the motion of the arrow and its possible trajectories. However, in the circumstances Robin finds himself in, the equations of Newtonian mechanics are sufficiently close to the relativistic case so that Robin can – in what looks like the correct epistemic sense – rationally depend on them, even though he cannot possibly know them. He cannot possibly know them because, strictly speaking, approximately true claims are false and knowledge is widely taken to be factive.¹⁹ This makes the counter-example especially potent because the encroachers cannot reasonably claim that Robin really does know the relevant proposition(s) *p* in this case, and this is the case because the example does not turn at all on Robin's degree of justification for the propositions of Newtonian mechanics, for he *knows* that those propositions are false. So, we have a *p*-dependent choice and it seems to be obviously *epistemically* rational for *S* to employ *p* (appropriately) in *S*'s practical reasoning but where it is clear that $\neg K_{sp}$. So, KNPR-N' appears to be false, and thereby KNPR' is impugned as well.

Now, one obvious retort is that while Robin cannot know the laws of Newtonian mechanics because they are false but approximately true, he can certainly know *that they are approximately true*. In point of fact, *ex hypothesi* this belief is adequately justified in this case. One might then submit that it is Robin's knowledge of the approximate truth of those propositions that is the basis of his

¹⁸ They can be regarded as approximately true in the standard sense (see Graham Oddie, "Truthlikeness," *The Stanford Encyclopedia of Philosophy* (Fall 2008 Edition), ed. Edward N. Zalta, URL= <<http://plato.stanford.edu/archives/fall2008/entries/truthlikeness/>>), partially true (see Elijah Millgram, *Hard Truths* (London: Wiley-Blackwell, 2009)), false but true enough (see Catherine Elgin, "True Enough," *Philosophical Issues* 14 (2004): 113-131), or inexactly true (see Paul Teller, "Twilight of the Perfect Model," *Erkenntnis* 55 (2001): 393-415 and Paul Teller, "The Finewright Theory," in *Nancy Cartwright's Philosophy of Science*, eds. Stephan Hartmann, Carl Hoefer, and Luc Bovens (London: Routledge, 2008), 91-116). The counter-examples here will work – with only very minor modification – for any of these alternative accounts of useful claims that are 'true-but-not-exactly-true.'

¹⁹ See Risto Hilpinen, "Approximate Truth and Truthlikeness," in *Formal Methods in the Methodology of the Empirical Sciences*, eds. Marian Przelecki, Klemens Szaniawski, and Ryszard Wojcicki (Dordrecht: Reidel, 1976), 19-42, Theo Kuipers, *What is Closer-to-the-truth?* (Amsterdam: Rodopi, 1978), Graham Oddie, *Likeness to Truth* (Dordrecht: Reidel, 1986) and Oddie, "Truthlikeness."

deliberation about whether to accept the wager. But, of course we can simply modify the story that introduces the counter-example slightly to avoid this riposte. Let us alter our story then as follows.

ROBIN 2: let us now suppose that Robin is an independently wealthy physics student studying Newtonian mechanics in 1795, that he believes that Newton's laws of force and motion are true, that this belief is adequately justified and that he is totally ignorant about archery. So he believes that the laws of Newtonian mechanics are true and he knows that he believes this. Let us then suppose that Robin is offered the same performance wager as in the first case and that the terms of the wager are the same. So, again Robin must use his practical reason to determine whether he should accept the wager or not. Now recall that since Robin is a physics student we can imagine that he quickly remembers Newton's laws of force and motion and so easily calculates that given the strength of the bow and a reasonable angle of trajectory, the arrow will travel at least 100 yards. So, Robin completes his practical deliberation, accepts the wager and proceeds to win, thus doubling his stake.

In this case, it still seems epistemically appropriate for Robin to employ the propositions that constitute Newton's mechanics in his deliberations and his choice is p-dependent for the same reason that apply in the case of ROBIN 1, but he does not know – or even believe – that they are approximately true in this case (even though they are in point of fact only approximately true), and, of course, he does not know that they are true. So, the counter-example is easily saved from this sort of response and the encroacher's view is in serious trouble unless they (1) claim that Robin *really* does know the propositions of Newtonian mechanics in the second case, or (2) they claim that Robin somehow *really* does know that the propositions of Newtonian mechanics are approximately true or close enough to true in the second case, or (3) they adopt the view that in the second case Robin is not acting in an epistemically appropriate manner. But none of these options seems reasonable at all and so the encroacher's view is in serious jeopardy. Strategy (1) fails straightforwardly because knowledge is factive. Strategy (2) fails (*ex hypothesi*) because Robin does not believe, let alone know, that the propositions of Newtonian mechanics are approximately true. Finally, strategy (3) would ultimately require adopting the totally implausible view that it is never epistemically rational to base one's practical reasoning on approximately true premises that one is adequately justified in believing. It is worth noting then that cases like the Robin cases are utterly pedestrian and so the jeopardy is both serious and widespread. It is often perfectly rational to base one's practical reasoning on propositions that one has adequate justification for but which are only approximately true, even when we do not know that they are only approximately

true. In fact, we typically do this because these sorts of propositions have great practical value. This happens with great regularity in both everyday reasoning and in sciences and we shall return to this topic shortly.

4. Weakened forms of KNPR

It is tempting however to believe that there are weaker forms of KNPR that avoid the counter-examples proposed here and two such responses have recently been proposed. The first alternative suggestion that seems relevant here is related to a position on the matter that has been endorsed recently by Ram Neta.²⁰ Neta also argues against KNPR and then argues that all of the examples offered by Hawthorne and Stanley in support of KNPR can be explained by a weaker version of that thesis.²¹ His discussion suggests that the following modification of KNPR' might be used to avoid the negative conclusion about the encroacher's view based on the Robin cases. Where the choice involved is p-dependent,

(JBKNPR) $JBsK_{sp} \equiv$ it is epistemically rational for S to employ p (appropriately) in S's practical reasoning.

Here $JBsK_{sp}$ just means that S justifiably believes that she knows that p. We can then derive the corresponding weaker version of KNPR-N' as follows: where the choice is p-dependent,

(JBKNPR-N) It is epistemically rational for S to employ p (appropriately) in S's practical reasoning $\rightarrow JBsK_{sp}$.

Neta's proposal however fails straightforwardly as it cannot accommodate ROBIN 1. In the first Robin case Robin's reasoning and subsequent action is epistemically rational, but he is not justified in believing that he knows that the laws of Newtonian mechanics are true. This is simply because he knows that they are false. He is however justified in believing that those laws are approximately true or close enough to true for his purposes and so this is suggestive of how one might modify JBKNPR in order to get the correct results in the Robin cases. What needs to be worked into JBKNPR in order to avoid the threat of ROBIN 1 is the requirement that one's beliefs used in practical reasoning need only to be known to be approximately true, and that they need not be known simpliciter. If we leave JBKNPR as it is stated however, ROBIN 1 refutes Neta's weakened version of KNPR. Neta's proposal appears however to do better in the case of ROBIN 2. In ROBIN 2 Robin is justified in believing that he knows that the laws of Newtonian

²⁰ See Ram Neta, "Treating Something as a Reason for Knowledge," *Nous* 43 (2009): 684-699.

²¹ See Neta, "Treating Something" and Hawthorne and Stanley, "Knowledge and Action."

mechanics are true because he has a great deal of evidence supporting the truth of that theory. This is not really the case however because Neta's proposal then faces a damning dilemma with respect to ROBIN 1 and ROBIN 2 *taken as a pair of counterexamples*.

On the one hand, JBKNPR can be maintained as is (i.e. without weakening it to require only that one justifiably believes that one knows that the propositions being used in one's practical deliberations are approximately true). But, then JBKNPR fails due to ROBIN 1. On the other hand, one could weaken JBKNPR and require only that one justifiably believes that one knows that the propositions being used in one's practical deliberations are approximately true. But, then JBKNPR fails due to ROBIN 2. One would have to maintain in ROBIN 2 that while Robin does not know that the laws of Newtonian mechanics are true and he does not know that they are approximately true, he is acting in an epistemically appropriate manner because he is justified in believing that he knows that the laws of Newtonian mechanics are approximately true. But this won't do at all. If JBKNPR is to save the encroacher's view from the threat posed by ROBIN 2 it would have to be the case that (a) Robin is justified in believing that he believes that the laws of Newtonian mechanics are approximately true, (b) he would have to be justified in believing that it is true that the laws of Newtonian mechanics are approximately true and (c) he would have to be justified in believing that he is justified in believing that the laws of Newtonian mechanics are approximately true in 1795 and as the case is described. These three claims are true (respectively) because knowledge presupposes belief, is factive and requires adequate justification.

It is clear however that the first of these three claims is not true in ROBIN 2. Robin believes falsely in that case that the laws of Newtonian mechanics are true and he knows that he believes that they are true. Given his evidence he is clearly not justified in believing that he believes that those laws are approximately true and he knows that he does not believe that the laws of Newtonian mechanics are approximately true. It is also not entirely obvious that Robin meets the second condition. Given his evidence in 1795 it is not at all obvious that he is justified in believing that the laws of Newtonian mechanics are approximately true, particularly if we are treating justification in terms of internalism. Finally, it is also not entirely obvious that the third claim is true in the second Robin case. Since Robin does not believe that the laws of Newtonian mechanics are approximately true in that scenario it would be exceedingly strange to say that he is justified in believing that he is justified in believing that the laws of Newtonian mechanics are approximately true. However, whatever one says about (b) and (c), the fact that (a)

is not met in ROBIN 2 while it is epistemically rational for Robin to use the claim that Newton's laws are approximately true in his deliberations in that scenario shows that Neta's weakened view of KNPR is in serious trouble. This also indicates more generally that the defenders of KNPR are in trouble because we have plausible counter-examples with respect to both KNPR-N' and with respect to JBKNPR-N, and so with respect to KNPR' and with respect to JBKNPR. So it appears to be the case that it can be epistemically rational to act on a false but approximately true proposition, even when one is not justified in believing that one knows it is true that such a proposition is approximately true.²²

A second recently proposed alternative that is relevant here has been endorsed by Clayton Littlejohn. Littlejohn, like Neta, argues against KNPR and claims that none of the examples offered Hawthorne and Stanley support KNPR.²³ What is more interesting is that he endorses what amounts to the following principle to replace both KNPR and JBKNPR.²⁴ Where the choice is p-dependent,

(JBKNPR) (JBsp) and (p is true) $\equiv$ it is epistemically rational for S to employ p (appropriately) in S's practical reasoning.

We can then derive the corresponding weaker version of KNPR-N. Where the choice is p-dependent,

(JBKNPR-N) It is epistemically rational for S to employ p (appropriately) in S's practical reasoning $\rightarrow$ (JBsp) and (p is true).

Littlejohn claims that this principle is the weakest principle that allows us to say of an agent both that he is concerned about the accuracy of his beliefs and that he is concerned with his concern for the accuracy of his beliefs. He then explains that,

...it makes sense to say that if p misrepresents how things are or the subject arrives at the belief that p in a way that only someone insufficiently concerned with the truth could have, it follows that the subject's belief that p is not proper and is not the proper basis for further deliberation.²⁵

But, even this principle is too strong, and ROBIN 1 and ROBIN 2 illustrate this clearly. Robin's actions in both cases are epistemically rational, but the propositions used by Robin in his practical deliberations certainly do not meet Littlejohn's factive condition that p be true. Again, as we have already seen, it

²² See Elgin, "True Enough" for discussion of the utility of false but 'true enough' beliefs.

²³ See Clayton Littlejohn, "Must We Act Only on What We Know," *The Journal of Philosophy* 106 (2009): 463-473 and Hawthorne and Stanley, "Knowledge and Action."

²⁴ Littlejohn refers to this principle as RJTBP in Littlejohn, "Must We Act."

²⁵ Littlejohn, "Must We Act," 473.

appears to be the case that it can be epistemically rational to act on a false but approximately true proposition. So the basis of practical reasoning has to be something weaker yet and the norm of practical reasoning does not appear to be knowledge *simpliciter*. It is then also worth noting that attempts to weaken KNPR like Neta's and Littlejohn's result in views that are no longer about knowledge. They are merely about justified belief. As a result, pragmatic encroachers who adopt the weakening strategy threaten both to undermine their stated motives and to make their view uninteresting – at least if they continue to maintain that their view is a revisionary theory of knowledge.²⁶

5. Practical Reasoning, Rationality and Not-Exact-Truths

Taking the lessons of the previous two sections to heart, a plausible candidate for a principle concerning the epistemic conditions on practical reasoning might then be something like the following one. Where the choice is p-dependent,

(JBATNPR) (It is at least the case that JB_{sp} is approximately true) and (p is at least approximately true) $\equiv$ it is epistemically rational for S to employ p (appropriately) in S's practical reasoning.

It is important to notice that the justified belief component of the left hand side of the bi-conditional is qualified by an 'at least' qualification with its scope outside the doxastic operator. This is intentionally designed to capture the idea that the norm of practical reasoning involves at least S being justified in her belief that p is approximately true. This is then compatible with S's being justified in her belief that p is strictly true as well her being justified in her belief that p is only approximately true. We cannot just substitute (JB_{sp} is at least approximately true) for (JB_{sp} or JB_{sp} is approximately true) without running into problems in the second Robin case. So that particular qualification is crucial. If we insisted on the condition with the scope as follows: (JB_{sp} is at least approximately true), then ROBIN 1 would not be too problematic. In ROBIN 1 this condition is met because Robin is justified in believing that the laws of Newtonian mechanics are approximately true and it is not unreasonable to suppose that Robin would also have the belief that those laws are then at least approximately true. In ROBIN 2 this condition would not be met because Robin is justified in believing that the laws of Newtonian mechanics are true, but it is not reasonable to suppose that he has the belief that they are approximately true or even at least approximately true.²⁷ Additionally, adopting that condition might give rise to the appearance that

²⁶ This point about weakening KNPR was suggested by a very helpful referee.

²⁷ This worry was suggested by a referee.

meeting the condition would be inferential and that would be problematic were one to deny the rationality of standard closure principles. So it looks like the condition with the qualifier outside the scope of the doxastic operator is the right way to go in defining the norm of practical reasoning. In the other conjunct in the left hand side of the bi-conditional p 's being at least approximately true signifies that p is true *or* that p is approximately true.

So this much weaker principle captures a much more reasonable sense of the epistemic conditions on practical reasoning and it has two important virtues. First and foremost, it gets us the correct result in both the ROBIN 1 and ROBIN 2 cases. In ROBIN 1 the M.I.T. Student is at least justified in his belief that the laws of Newtonian mechanics are approximately true because, *ex hypothesi*, he knows the conditions under which the approximations involved are appropriate, and those laws are in fact approximately true. In ROBIN 2 the 1795 counterpart of our contemporary M.I.T. student is justified in believing that the laws of Newtonian mechanics are true *simpliciter* so he too is at least justified in his belief that the laws of Newtonian mechanics are approximately true. Moreover, they are in fact approximately true. So JBATNPR appear to get things right with respect to the norm of practical reasoning, but it involves significant weakening of KNPR and even of its weaker cousins.

Second, this weak principle of the epistemic conditions on practical reasoning respects what a number of variously motivated philosophers have convincingly argued about epistemic rationality and inexact truth to a much greater extent than do any of the other proposals. This is interesting because the parties to the debate about pragmatic encroachment and the defenders of the knowledge norm of practical reasoning have by and large simply assumed some implicit philosophical or folk theory of rationality in the discussion of these ideas that ignores the practical rationality of inexact, partial or approximate truths. Serious discussion of the substance of rationality itself is conspicuously absent in all of Williamson's, Hawthorne and Stanley's, Neta's and Littlejohn's papers and so this is not really a surprise.²⁸ But, this lacuna is problematic here because what a number of other philosophers have recently and compellingly argued is that rational thinking and acting involves the use of approximations, idealizations and/or inexact truths.²⁹ That we are less than perfectly rational is, of course, not at

²⁸ See Williamson, "Contextualism, Subject-Sensitive Invariantism," Hawthorne and Stanley, "Knowledge and Action," Neta, "Treating Something," and Littlejohn, "Must We Act."

²⁹ See Catherine Elgin, *Considered Judgment* (Princeton: Princeton University Press, 1996), Elgin, "True Enough," Nancy Cartwright, *How the Laws of Physics Lie* (Oxford: Oxford University Press, 1983), Millgram, *Hard Truths*, Teller, "Twilight of the Perfect Model" and

all a new recognition and the debates between the various defenders of the heuristics and biases tradition, the ecological rationality model and more traditional views attests to this.³⁰ We do not need to go into the details of these debates here, but what they strongly suggest is that we sometimes base both practical and theoretical reasoning on propositions that are not-exactly-true and that we can be efficient problem solvers and deliberators even though we do not reason in maximally accurate ways on the basis of exact truths.³¹ We often trade degrees of accuracy with respect to truth for things like efficiency, ease of use and generality – just as Robin does in ROBIN 1 and ROBIN 2 – but without compromising rationality or success. There is nothing irrational about employing approximate, partial or inexact truths in our practical reasoning and JBATNPR reflects this whereas the stronger alternatives discussed above simply do not do so. In that respect JBATNPR is more realistic.

6. Objections, Responses and Implications

Let us then turn to the consideration of some possible objections that the pragmatic encroacher's might raise about the cases and to some responses they might give to the results derived from the cases. The first two objections involve claims that the cases are misdescribed in some important way and that the factivity condition is met in both Robin cases. The first such objection involves looking at some worries about the relationship between Newtonian mechanics and relativistic mechanics. The second such objection, involves some potential worries about the relationship between truth and approximate truth. Two more radical responses to the results presented here involve conceding the descriptive correctness of the cases, and rejecting the conclusions drawn on the basis of those cases nonetheless. The first such response involves the rejection of factivity and the other response involves the adoption of the safety condition on knowledge. Ultimately it will be shown here that all of these objections and responses are inadequate, but they are worth looking at nonetheless.

"The Finewright Theory," Mark Wilson, *Wandering Significance* (Oxford: Oxford University Press, 2006), and William Wimsatt, *Re-engineering Philosophy for Limited Beings: Piecewise Approximations to Reality* (Cambridge: Harvard University Press, 2007).

³⁰ See, for example, Renée Elio, ed., *Common Sense, Reasoning and Rationality* (Oxford: Oxford University Press, 2002), Massimo Piattei-Palmarini, *Inevitable Illusions* (New York: Wiley, 1994), Gerd Gigerenzer, *Adaptive Thinking* (Oxford: Oxford University Press, 2000), Michael Shaffer, "Decision Theory, Intelligent Planning and Counterfactuals," *Minds and Machines* 19 (2009): 61-92, and Michael Shaffer, *Counterfactuals and Scientific Realism* (New York: Palgrave MacMillan, 2012).

³¹ See Shaffer, "Decision Theory, Intelligent Planning."

So, one way to challenge the results here would be to challenge the acceptability of the Robin cases in terms of the manner in which the relationship between Newtonian mechanics and relativity theory is understood in those cases. In the first Robin case it is assumed that Newtonian mechanics is false and that relativity theory is true. So the former cannot be known and the latter can be known. But, some philosophers of science do not accept these claims. Some philosophers of science argue that theories that have been superseded by better theories that capture them as restricted cases are not false.³² So it would not follow that if relativity theory is true, then Newtonian mechanics is false. If this view were granted, then in the first Robin case Robin could know Newtonian mechanics because it is not false. The factivity condition on knowledge would be met and KNPR would be immunized against the Robin counter-examples. Robin would then have knowledge if he has the relevant beliefs about Newtonian mechanics and if those beliefs were justified. Other philosophers of science argue that *no* theories are true.³³ If this is the case, then in the first Robin case Robin would not know that relativistic mechanics is true and so it would not be rational for him to base his practical reasoning on that theory.

The problem with the first component of this objection is that it faces a damning dilemma. Newtonian mechanics can be understood as Newton proposed it or as a special case of relativistic mechanics – as it is understood contemporarily. As is well-known Newton proposed his theory unrestrictedly (i.e. it was claimed to hold at all velocities and for all masses). So if Newtonian mechanics is understood as Newton understood it (and as Robin would understand it in 1795), then it is false. Its observable implications have been found to be false and so it has been definitively falsified. Robin of course probably does not believe Newtonian mechanics in this sense in ROBIN 1, as he is aware of the relationship between the two theories of mechanics. So this appeal gets ROBIN 1 right and Robin could know Newtonian mechanics. If we understand Newtonian mechanics as having a restricted scope (i.e. as a special case of relativity theory) then it is true. But, that is *not* what Robin believes in ROBIN 2. We cannot non-anachronistically say that Newton's theory is a true special case of relativistic mechanics and that 1795 Robin believes *that*. So this suggestion cannot get the correct result in ROBIN 2.³⁴

³² See Fritz Rorhlich and Larry Hardin, "Established Theories," *Philosophy of Science* 50 (1983): 603–617. This is of course not the orthodox view of the matter.

³³ Cartwright, *How the Laws of Physics Lie*.

³⁴ This response is the same response that one can give to versions of the correspondence principle famously defended by Bohr, Poincaré, and others. See Michael Shaffer, "Idealization, Counterfactuals and the Correspondence Principle," in *The Courage of Doing Philosophy: Essays Dedicated to Leszek Nowak*, eds. Jerzy Brzeziński, Andrzej Andrzej, and Theo A. F.

Thus, the pair of counter-examples would still refute KNPR. The problem with the second component of this objection is that it is not at all clear that *all* theories are false and that relativity theory cannot be known or rationally used in practical deliberations. It may well turn out that relativity theory itself *is false but approximately true*, and so it would be rational for Robin to base his reasoning on those propositions even if that theory is not strictly true. This was the upshot of JBATNPR.

Finally, if one is not entirely convinced by these responses to this objection, we can simply construct a different counterexample that does not involve theories at all. As a result, the objection is rendered moot. Consider the following case:

ROBIN 3: suppose that Robin is an independently wealthy carpenter in 2009 and who is totally ignorant about archery. Suppose then that Robin has been offered a fairly standard sort of performance wager. The terms of the wager are as follows. Robin will be given a bow and arrow, although Robin has never previously used this bow or one of its type. Nevertheless, he is aware of the strength of the bow and is assured that it is perfectly functional, that the arrow is perfectly normal and that anyone can use it effectively without much training. He is allowed to train as much as he likes, however. Robin is asked to put up \$50, and provided he can shoot an arrow beyond a marker set at 30 yards he will win \$100. If he fails to do so, then he loses the \$50 he put up. So, Robin must use his practical reason to determine whether he should accept the wager or not. Initially, given his ignorance of archery, he has no idea whether the bow is capable of shooting an arrow beyond the marker. So Robin takes 10 practice shots and uses his handy tape measure to determine to the closest tenth of a foot that arrows landed approximately 105.5 yards., 103.6 yards, 106.8 yards, 101.7 yards, 107.3 yards, 102.3 yards, 104.1 yards, 103.2 yards, 106.5 yards, and 103.3 yards away. So, on the basis of what – being a good carpenter – he knows to be only approximate measurements he concludes that an arrow fired from the bow will travel at least 100 yards. So, Robin completes his practical deliberation, accepts the wager and proceeds to win, thus doubling his stake.

So Robin is epistemically rational in his practical reasoning, but does not know the distances that the arrows really travelled. His beliefs about those distances are all only approximately true and so do not constitute knowledge and he knows this, but this does not preclude him from being rational in using them in his practical reasoning. More importantly, none of this depends on his beliefs about any scientific theory at all and so this objection can easily be circumvented in this manner. Moreover, making the analogous move that gave rise to ROBIN 2

Kuipers (Amsterdam: Rodopi, 2007), 179-204 and Michael Shaffer, "Re-formulating the Correspondence Principle: Problems and Prospects," *Polish Journal of Philosophy* 2 (2008): 99-115 for criticism of that view of inter-theoretical relations.

from ROBIN 1 and claiming that Robin knows that the distances the test arrows were fired are approximately true will not work here either because we can slightly alter the story as follows:

ROBIN 4: suppose that Robin is an independently wealthy lounge singer in 2009 and who is totally ignorant about archery. Suppose then that Robin has been offered a fairly standard sort of performance wager. The terms of the wager are as follows. Robin will be given a bow and arrow, although Robin has never previously used this bow or one of its type. Nevertheless, he is aware of the strength of the bow and is assured that it is perfectly functional, that the arrow is perfectly normal and that anyone can use it effectively without much training. He is allowed to train as much as he likes, however. Robin is asked to put up \$50, and provided he can shoot an arrow beyond a marker set at 30 yards he will win \$100. If he fails to do so, then he loses the \$50 he put up. So, Robin must use his practical reason to determine whether he should accept the wager or not. Initially, given his ignorance of archery, he has no idea whether the bow is capable of shooting an arrow beyond the marker. So Robin takes 10 practice shots and uses his handy tape measure to determine to the closest tenth of a foot that arrows landed 105.5 yards., 103.6 yards, 106.8 yards, 101.7 yards, 107.3 yards, 102.3 yards, 104.1 yards, 103.2 yards, 106.5 yards, and 103.3 yards away. So, on the basis of what he takes to be accurate measurements he concludes that an arrow fired from the bow will travel at least 100 yards. So, Robin completes his practical deliberation, accepts the wager and proceeds to win, thus doubling his stake.

Here Robin is again perfectly rational in his practical reasoning, but he does not even believe that the measurements are approximately true and so cannot know that to be the case. So this objection fails, whatever one might say about the relationship between Newtonian and relativistic mechanics.

A second – and closely related – way to challenge the Robin cases would be to challenge the assumption that if a proposition is approximately true, then it is false. Were one to adopt this view, then one could maintain that some approximately true theories are also true. If this were true of Newtonian mechanics, then that theory would be true as well as approximately true. So, in the first Robin case Robin could meet the factivity condition on knowledge and would know Newtonian mechanics, thus immunizing KNPR against that counterexample. As in the case of the first objection, Robin would then have knowledge in the first case because he has the relevant beliefs, they are justified and they are true. The problem with this view is that all extant theories of approximate truth are explicitly based on the claim that all approximately true propositions are strictly false, although there are many falsehoods that are not

approximately true.³⁵ So, if this strategy were to be pursued, we would be owed an account of approximate truth that does not incorporate this feature. But, it is difficult to see why one might want such a theory. The extant theories of approximate truth, truthlikeness and verisimilitude were developed specifically to make the distinction between not-true propositions that are just false and not-true propositions that are approximately true.³⁶ More importantly, this maneuver does nothing to immunize KNPR against ROBIN 2. Even if one could make sense of this idea in ROBIN 2 Robin does not believe that Newtonian mechanics is approximately true and so cannot reasonably be taken to believe that the theory is approximately true and true.

Encroachers however might just grant that the counterexamples are adequate with respect to the theories involved and with respect to the relationship between the concepts of truth and approximate truth, and simply attempt to dodge the criticism by arguing that in both cases Robin does know. The first way to do this involves the recognition that in both Robin cases the stakes are low. As we saw in section 1, encroachers believe that in low stakes situations knowledge is more prevalent than in high stakes situations. So encroachers can potentially respond to the Robin cases by arguing that in both cases Robin does know Newtonian mechanics even though the propositions that constitute that theory are false but approximately true. What an encroacher might then say is that in low stakes situations approximate truth is sufficient for knowledge and that these cases involve low stakes. This then amounts to the concession of the factivity condition on knowledge and it would amount to accepting the claim that knowledge entails (at least) approximate truth. Since the defenders of KNPR have already adopted what looks like a view that is a radical departure from what is epistemological orthodoxy, they could simply embrace this consequence. The second way to potentially dodge the Robin cases without challenging the adequacy of construal of the relationship between the theories involved and without challenging the assumptions about the concepts of truth and approximate truth made in those cases involves weakening KNPR-N' to require only that the conclusions of practical deliberations be known and the epistemic principle known as safety.³⁷ The safety condition is often stated as follows: if S believes that p, then p would not easily have been false.³⁸ Safety is widely supposed to have a strong degree of

³⁵ See Oddie, "Truthlikeness."

³⁶ See Oddie, "Truthlikeness" and Kuipers, *What is Closer-to-the-truth?*

³⁷ This strategy was suggested by a helpful referee.

³⁸ See for example Ernest Sosa, "Skepticism and Contextualism," *Philosophical Issues* 10 (2000): 1-18.

intuitive support and so its application here is at least *prima facie* promising. Given this approach, it would be rational to employ false but approximately true premises in practical deliberation provided that the conclusion reached is one that could not easily have been false. The encroacher could then argue on the basis of the safety condition on knowledge that Robin's belief that the arrow would fly further than 30 yards could not easily have been false, because it was derived from theoretical claims that are close to the truth. So, despite the fact that Robin's calculations involve approximately true premises, the conclusion would be known nonetheless.

Let us address these two responses in turn. First, what can we say about the suggestion that encroachers adopt the view that knowledge entails approximate truth rather than truth? As we have already seen this amounts to the denial of factivity and thus entails that at least some falsehoods can be known. There are few more firmly entrenched orthodoxies in epistemology than factivity and so this is a radical suggestion to say the least. It is especially problematic in that it not only has the implication that falsehoods can be known, but also it has the implications that justification cannot exclusively be a matter of support for truth and that belief cannot be commitment to the truth of a proposition. Justification cannot be support for truth alone if factivity is ceded because otherwise some known propositions would turn out to be unjustified. Such propositions would be known approximate truths for which there is no justification in the sense of support for their (strict) truth. So the encroacher who responds in this way would have to replace the standard justification condition on knowledge as well with something more akin to the requirement only that S be justified in the belief that p is approximately true. Similarly, if factivity is ceded, then the commitment involved in knowledge cannot be belief in the (strict) truth of a proposition. This is problematic in both cases because it is widely accepted that truth is the norm both of belief and of justified belief. In ceding factivity, encroachers would have to adopt a view of belief and justification that involves only the commitment to approximate truth. Otherwise some propositions would be known but not believed to be true. As a result, the denial of factivity is dangerously close to collapsing knowledge into mere belief and thus obliterating any possibility of usefully articulating *epistemic* conditions on the rationality of practical reasoning. This seems to be an excessively radical step to take in order to preserve KNPR in light of the Robin counter-examples. In addition, it is not clear that this response works in the case of ROBIN 2. This is simply because in that case Robin does not believe that Newtonian mechanics is approximately true and so cannot

presumably know the propositions that make up that theory, whatever one says about factivity.

Let us then consider the second suggestion involving the safety condition and the weak requirement that only the conclusions of practical reasoning be known. We might state this alternative as follows. Where p is a reason and q is a conclusion drawn on the basis of p and the choice is p -dependent and q -dependent,

(SCNPR-N) It is epistemically rational for S to employ p and q (appropriately) in S 's practical reasoning $\rightarrow$ (it is at least the case that JBp is approximately true), (p is at least approximately true) and $K'sq$.

Here we are to understand that K^*sp specifically requires meeting the safety condition. As we have seen this response looks promising because in ROBIN 1 and ROBIN 2 Robin could be taken to know the conclusion of his practical deliberations based on the false but approximately true propositions that constitute Newtonian mechanics because that conclusion could not easily have been false given the approximate truth of that theory. Given this approach, he knows that the arrow will fly further than 30 yards because that belief is safe and that belief is safe because it was derived from propositions that are approximately true. The problem with this view however is straightforwardly clear. One can be epistemically rational in one's practical reasoning even if the conclusion one draws on the basis of approximately true premises is not known. This can be because some such conclusions are approximately true but not safe, and therefore not known according to such views. Consider the following modification of ROBIN 4:

ROBIN 5: suppose that Robin is an independently wealthy carpenter in 2009 and who is totally ignorant about archery. Suppose then that Robin has been offered a fairly standard sort of performance wager. The terms of the wager are as follows. Robin will be given a bow and arrow, although Robin has never previously used this bow or one of its type. Nevertheless, he is aware of the strength of the bow and is assured that it is perfectly functional, that the arrow is perfectly normal and that anyone can use it effectively without much training. He is allowed to train as much as he likes, however. Robin is asked to put up \$50, and provided he can shoot an arrow beyond a marker set at 100 yards he will win \$100. If he fails to do so, then he loses the \$50 he put up. So, Robin must use his practical reason to determine whether he should accept the wager or not. Initially, given his ignorance of archery, he has no idea whether the bow is capable of shooting an arrow beyond the marker. So Robin takes 10 practice shots and uses his handy (and previously reliable) tape measure to determine to the closest tenth of a foot that arrows landed 100.1 yards, 100.0 yards, 100.1 yards, 100.3 yards, 100.2 yards, 100.2 yards, 100.0 yards, 100.1 yards, 100.2 yards,

and 100.2 yards away. So, on the basis of what he takes to be approximate measurements he concludes that an arrow fired from the bow will travel at least 100 yards. So, Robin completes his practical deliberation, accepts the wager and proceeds to win, thus doubling his stake.

In this case Robin's practical reasoning is epistemically rational, it is successful and it is based on approximately true propositions that he is justified in believing to be approximately true. But his conclusion could easily have been false because of the small degree of difference between the approximate measured values and the real distance of the marker. So, given safety, Robin does not know that the arrow will travel at least 100 yards. The only way that the appeal to the safety condition can then save KNPR and pragmatic encroachment in general here is by rejecting factivity. But we have already seen the problematic consequences of pursuing that line of reasoning. Consequently, adopting this modification of KNPR is not sufficient to save the pragmatic encroacher's views. Moreover, even if this weakened view could be salvaged it would be a serious concession on the part of the pragmatic encroachers to adopt it in any case, because it is no longer a pure analysis of knowledge in much the same way that Neta's and Littlejohn's proposals are not versions of strong pragmatic encroachment.

7. Conclusion

So it seems to be the case that we actually reason rationally and perform remarkably well on the basis of approximations and JBATNPR best reflects these facts as an account of the epistemic dimensions of practical reasoning. There then is a perfectly well understood sense in which Robin's behaviors in the various Robin cases are rational, but not in the way assumed by the pragmatic encroachers. It seems reasonable to suppose that in the cases described above Robin uses approximations in reasoning about whether to accept the wager in a perfectly rational way even though they are not strictly true. In general we use these sorts of approximations because they are appropriate in specific contexts and in the Robin cases doing so allows him to secure an efficient and successful solution to his problem in a rational manner. He is rational in those cases because he is either justified in believing the relevant claims are true or he is justified in believing that they are approximately true, and those claims really are at least approximately true for those situations. Of course, this would not necessarily be the case for other situations, but this sort of behavior looks to be the norm rather than the exception.