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Epistemological Experiments and Empirical Philosophy in Cross-Cultural Contexts

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Epistemological Experiments and Empirical Philosophy in Cross-Cultural Contexts¹

THE CONTINUITY OF EPISTEMOLOGICAL THOUGHT EXPERIMENTS ACROSS CULTURES

(A) Imagine that we are seeking water on a hot day. We suddenly see water, or so we think. In fact, we are not seeing water but a mirage, but when we reach the spot, we are lucky and find water right there under a rock. (8th century² Indian philosopher, Dharmottara, in Dreyfus, p. 293)

(B) Looking into a field, *S* sees an animal only a few yards off that looks, sounds, smells, etc., exactly like a sheep, and *S* noninferentially forms the perceptual belief that there is a sheep in a field. Actually the animal is of a different species but has been artfully disguised. Yet there is a sheep in the field – way off in a remote corner of the field, completely hidden behind thick hedges. $(20^{th} \text{ century US philosopher, Roderick Chisholm, 1966}^3)$

In epistemology, it has been common to refer to the intuition that *knowing* something and *only believing* something are not the same. The two cases above are attempts by philosophers to elicit this particular intuition in their readers. In these examples, Dharmottara and Chisholm describe an everyday situation in which a person forms a belief about some matter of fact, using the (typically reliable) everyday methods of belief-formation. What is more, the belief the person forms is true. Yet, they suggest, we want to say that this person does not really *know* what she believes. They ask, if knowledge is a matter of believing what is true, and having the right sort of reasons for believing it, then what is it that prevents us from saying someone knows in cases like this?

What is intriguing about these cases is that Chisholm was writing in the United States in the 20th century, whilst Dharmottara was writing in 8th century India. The cultures in which these two men were writing were quite different in uncountable ways and yet both seem to share this intuition that there is something pretty odd about the relationship between knowledge and belief. Annex (C)-(L) provides an abbreviated list of other similar thought experiments which seem to have stood the test of time. One can find such examples in philosophical writings from Ancient Greece to 6th century India to 14th century Italy to today's philosophy departments in the US and Europe. In other words, across times and places, philosophers have conceived of and considered the same kinds of thought experiments and elicited the same intuitions. Some of these

¹ I would like to thank Peter Graham, Nenad Miscevic, and Malini Sur for their insightful feedback on an earlier version of this paper presented at Soochow University, Taipei, and subsequent drafts.

² Exact dates for many of the historical examples given are not known.

³ For related formulations, see Dretkse 1970 and Kerr and Pritchard 2012, p. 195-7.

historical examples have been referenced in recent philosophical debate and are of great interest to epistemologists because of their similarity to modern examples (Boyd and Nagel 2014; Stoltz 2007).⁴ When philosophers make a claim, they do not (usually) mean to make a specific claim about the particular culture in which they are operating. Most of the time, they mean to make a general claim; in this case, a claim about knowledge and belief, not about knowledge in 8th century India or belief in 20th century United States. When philosophers write, 'Intuitively, it seems that x' or 'It seems to us that x' or 'We would surely say that x' they do not mean by this that 'I find x intuitive' or that 'We philosophers find x intuitive'. This would be a rather uninteresting claim from this point of view. It is instead a shorthand for saying that competent, thoughtful speakers would, given the right conditions, find x intuitive (Cullen 2009, p. 4). If you understand what 'knows' means you also understand that 'knows' is not identical to 'believes'. True, there may be someone who does think that 'knows' is the same as 'believes' (or 'hopes' or 'jumps') but it seems like this person has misunderstood the concept rather than that we should revise our understanding of knowledge. In other words, the claim is meant to be broadly universal, once you understand the concepts being used. Examples such as (A)-(L) provide a bulwark against the claim that philosophers are stuck in an acultural, ahistorical, detached realm of abstract propositions, practising what is pejoratively referred to as 'armchair' philosophy. If such axioms are so commonly found, they likely refer to something more general than cultural, linguistic or historical contingencies and the armchair is as good a place as any from which to access them.⁵

Epistemologists refer to kinds of thought experiment referenced above as Gettier cases after the cases in Edmund Gettier's enormously influential 'Is Justified True Belief Knowledge?' (Gettier 1963).⁶ Responses to the Gettier problem – as it has become known – form a hefty bulk of the last half century of epistemological research although, as we have seen, the problem has been with us for a considerably longer period. The historical reappearance of Gettier cases is not the only argument in defense of the armchair. Nagel, for example, argues that the lexical universality of 'knows' and 'thinks' (read: believes) suggests that the kind of distinction marked by Gettier cases runs deeper than a series of coincidental cultural accidents (Nagel 2013, p. 185-6). After all, grasping the intuitive support for Gettier cases requires adhering to a distinction between knowing something and merely believing it. She argues that the kind of distinction Gettier cases are meant to probe are remarkably culturally robust, drawing a line between

⁴ The precise definition of an intuition is one that has been debated extensively. Goldman and Pust argue that intuitions are judgments whose contents are 'singular classificational propositions, to the effect that [X is a case of C].' (Goldman and Pust 1998, p. 182) Ludwig defines intuition as 'an occurent judgment formed solely on the basis of competence in the concepts involved in response to a question about a scenario, or simply an occurent judgment formed solely on the basis of competence in the concepts involved in response to a question about a scenario, or simply an occurent judgment formed solely on the basis of competence in the concepts involved in it.' (Ludwig 2007, p. 135) Sosa defines intuitions in the following terms: 'S *rationally* intuits that p if and only if S's intuitive attraction to assent to is explained by a competence (an epistemic ability or virtue) on the part of S to discriminate, among the contents that he understands well enough, the true from the false, in some subfield of the modally strong (the necessarily true or necessarily false), with no reliance on introspection, perception, memory, testimony, or inference (no further reliance, anyhow, than any required for so much as understanding the given proposition.' (Sosa 2007, p. 61) See also Chudnoff (2013a; 2013b) for extended discussions on different accounts of intuition. Many of these accounts are quite incompatible. In this paper, I have tried to phrase what I say about intuitions in such a way as to be broad enough to apply to most accounts. Certainly, the empirical methodology I advocate should be taken to be applicable to most mainstream accounts of intuition such as those given above.

⁵ Stoltz (2007) and Boyd and Nagel (2014, p. 109), for example, make this claim. The question of whether intuitions can be used as evidence in epistemology has generated a substantial and extended debate. See Bealer 1998, Brown 2011, Buckwalter 2012b, Cappellan 2012, Cath 2012, Chudoff 2013, Clark 2013, Deutsch 2010, Earlenbaugh and Molyneux 2009a, 2009b, Goldman 2007, Kornblith 2007, Kuntz and Kuntz 2011, Levin 2004, Liao 2008, Ludwig 2007, 2010, Mizrahi 2012, 2013, Nagel 2007, 2012a, 2012b, 2013, and Pust 2000, Seeger 2010, Silva 2013, D. Sosa 2006, E. Sosa 2007a, 2007b, 2009, Stich 2013, Symons 2008, Tobia, Buckwalter, and Stich 2012, Weatherson 2003, Weinberg 2007, Weinberg, Gonnerman, Buckner, and Alexander 2010, and Williamson 2004.

⁶ See Annex (L) for an example.

'superficial' variation and 'deeper structural features of knowledge'. So can philosophy just go home, back to its armchair, safely reliant on competent, thoughtful reflections on the nature of knowledge and belief?

EXPERIMENTAL EPISTEMOLOGY: DO EPISTEMIC INTUITIONS VARY?

Experimental philosophy (henceforth, x-phi) argues that it cannot. In this paper, I will mostly constrain myself to that branch of x-phi that deals with experimental epistemology (henceforth, x-ep) but it is first worth describing the general philosophical argument.⁷ We witness a great deal of variation in reasoning practices, moral intuitions, semantic intuitions, and the like. Prior to finding out the facts, we should not presume that epistemic intuition is an exception. Since the early 2000s, philosophers and psychologists have been exploring the possibility that many of the assumptions that form the agreed basis of current philosophical and psychological debates might be false. Axioms previously thought to be beyond empirical investigation, may in fact be a source of disagreement. This new brand of philosophical-psychologist (or psychological-philosopher) argues that relating philosophical questions to actual lived practice is a central part of philosophy and that this requires paying attention to the way people think and reason.⁸ They use methods of experimental and social psychology to 'probe the way people make judgments that bear on debates in philosophy' (Nadelhoffer and Nahmias 2007, p. 123; Nichols 2004, p. 154). In the words of two leading figures in the x-phi movement, Joshua Knobe and Shaun Nichols write that x-phi is:

...concerned with questions about how human beings actually happen to be. We recognize that such an inquiry will involve us in the study of phenomena that are messy, contingent, and highly variable across times and places, but we do not see how that fact is supposed to make the inquiry any less genuinely philosophical. On the contrary, we think that many of the deepest questions of philosophy can only be properly addressed by immersing oneself in the messy, contingent, highly variable truths about how human beings really are.

(Knobe and Nichols 2007, p. 3)

What is key here is not the observation that human behaviour is contingent and culturally and historically variable. Such a statement is trivially true. The challenge from x-phi is that philosophers should insert themselves into this messy world; that discoveries about how people actually are is relevant to and can inform philosophical theory. One way in which how people actually are may be relevant is in the use of intuition to support an argument.⁹ Every argument has to start somewhere. Sometimes it starts with an intuition. As we have seen, a common practice in philosophy is to describe hypothetical cases such as the ones that opened this article and to make a claim of the form: 'In this case, it seems that x.' The appeal to such an intuition is then used to form part of a philosophical argument about the nature of a concept. If one accepts the intuition, the rest ought to follow (Knobe 2004, p. 37). Regarding the Gettier problem, one might make a claim of the form: 'In this case, it seems that *S* does not know but only believes *p*.' X-ep aims to undermine this implication of Gettier cases by claiming that:

⁷ I do not seek in the following to characterise every researcher and research programme with such general statements. There are those working in the field who would no doubt not wish to apply this characterisation to their own work. It is, after all, a broad church. Nevertheless, I do wish to summarise a particularly significant challenge that comes out of research in experimental epistemology and is defended by many in the field.

⁸ They are, of course, not the first to have proposed this. The general approach has precursors in the Wittgenstein of the *Investigations* (Wittgenstein 1953, 116), in Arne Næss' empirical semantics (Chapman 2011), and debates in ordinary language philosophy. A more recent precursor can be found in investigations of folk psychological concepts of belief, e.g. Hewson 1994, Kusch 1997. The method, however, is new.

⁹ See footnote 5 for discussion of an opposing argument that *even if* the intuitions articulated by philosophers are not generally shared then they can still count as evidence since they are, in some sense, expert intuitions. Buckwalter (2014) provides a comprehensive summary of this debate.

- the epistemic intuitions of philosophers are no more legitimate than those of non-philosophers¹⁰ and/or
- relying on epistemic intuitions (whether personal or widely held) at all is illegitimate call this reliance the 'intuition method' (Bishop 2009)¹¹; and/or
- epistemic intuitions reported by Western philosophers do not necessarily represent those of the general population – that intuitions divide along a wide range of factors including geographical and cultural boundaries – and that this affects their evidentiary status.¹²

Recent research in x-phi and x-ep has provided empirical evidence that challenges whether claims upon which philosophical arguments rest are broadly universal. For instance, Nichols et al. write,

[W]e are inclined to think that the lesson to be drawn from our cross-cultural studies is that, however obvious they may seem, these intuitions are simply not to be trusted. If the epistemic intuitions of people in different groups disagree, they can't all be true. The fact that epistemic intuitions vary systematically with culture and SES indicates that these intuitions are caused (in part) by culturally local phenomena. And there is no reason to think that the culturally local phenomena that cause our intuitions track the truth any better than the culturally local phenomena that cause intuitions that differ from ours."

(Nichols, Stich, and Weinberg 2003, p. 243)

Machery et al. concur:

We find it wildly implausible that the semantic intuitions of the narrow cross-section of humanity who are Western academic philosophers are a more reliable indicator of the correct theory of reference... than the differing semantic intuitions of other culutral or linguistic groups.

(Machery et al. 2004, p. 9)

¹⁰ Note that, when looked at from a cross-cultural perspective, the same point could be made for the epistemic intuitions of non-Western philosophers. If 8th century Indian philosophers had wildly different intuitions about Gettier-type cases then the argument could be made that, amongst groups of philosophers, the intuitions of one group is no more legitimate than those of another group. Indeed, this happens although, at least in the Gettier case, it is not clear the extent to which these examples are outliers Cf. fn. 11.

¹¹ Alexander and Weinberg, for example, argue that 'experimental evidence seems to point to the unsuitability of intuitions to serve as evidence at all. (2007, p. 63) For a response, see Nagel 2013. It is worth noting that while Nagel uses the kinds of examples I have listed as (A)-(L) as support for the continuity of intuitions across time periods and geographies, this continuity is not as clear-cut as it is sometimes made out to be. One problem is that we do not have data for all philosophers, or even a significantly large number of them, and so there is the chance of selection bias. If the allegation from experimental philosophy is that philosophers train their intuitions to respond in certain ways, then this may reinforce which philosophers form part of the canon and which get consigned to posterity. Whilst Nagel, in a reply to Stich, cites Dharmottara, Sriharsa, and Gangesa as three Indian philosophers who have used the philosophical method of eliciting intuitive responses to thought experiments, the latter of these actually contradicts the case for continuity. (Nagel 2013, p. 179) Matilal suggests that Gangesa would have come to the opposite conclusion were he to have read Gettier's paper i.e. he would have said that the subject in Gettier cases does know. (Matilal, p. 138-9) It may turn out that, on the whole, most philosophers do respond to Gettier-like cases in the same way but it is worth noting that, even amongst philosophers, we can identify some variation.

¹² See, for example, Weinberg et al. 2001, Beebe, Runya, Wysocki, and Endara forthcoming, 2015, Beebe and Undercoffer forthcoming, forthcoming 2016.

Indeed, the fact that this group (of professional philosophers) go through extensive training and selection might mean that their responses to certain thought experiments are precisely the ones that are not representative of intuition, but are the result of reinforcement and institutional consensus-building (Machery et al. 2004, p. 9). Within the realm of x-phi, this line of argument has its roots in Stephen Stich's work in the late 1980s and early 1990s (Stich 1987, 1990). Stich argued that empirical evidence suggests that there are significant differences in how different people reason about the world. Further, there are significant differences in epistemic intuitions, concepts, judgments, and practices. For Stich, these two hypotheses, if correct, undermine the intuition method.

Let's suppose that Stich is correct. Then, once the empirical work is done, we should expect to find all sorts of variation in epistemic intuitions about the kinds of thought experiments we are familiar with in analytic epistemology. In the next section, I will look at the claims made by experimental epistemologists (and, where relevant, by x-phi more generally) and whether such claims can pick out epistemic cultural variation of the kind predicted. It is not clear that they do. In the light of this, x-ep is left with, at least, two choices. The first, is to say that these are early days. X-ep only began in earnest at the turn of the 21st century and some of the experiments have been carried out by philosophers who are just getting to grips with the complexities of social psychological methods and how to apply them to epistemological issues. Some of the experiments, as I shall discuss, were methodologically flawed but if we were to refine them and do further studies, with better controls, with better comprehension tests, more participants, and testing more variables, we will likely get more robust results confirming or disconfirming the hypothesis.

The second is to agree that the initial motivations behind x-ep are valid and that, particularly as this is a fledgling project, the method is open to refinement and expansion. If we are to investigate the predicted variation in epistemic cultures, then conducting surveys and testing intuitions about Gettier cases may not be enough. It may be that survey methods and cognitive scientific research is not able to get at subtle cultural differences. In this paper, my aim is to widen the debate beyond, on the one hand, Gettier intuitions and similar 'vignettes' that aim to get at intuitions about knowledge and, on the other hand, social psychological and cognitive scientific methods. Survey methods are limited to vignettes in a way that the widened methods I am arguing for are not. I aim to provide an alternative explanation for why results in x-ep have been underwhelming, despite a plausible hypothesis. According to this view, even if Gettier intuitions turn out to be 'culturally robust' (in the sense that they do not admit of significant cultural variation), then there is still a role for an empirically-informed epistemology.

Experimental Epistemology: What Factors Affect Epistemic Intuitions?

The shape of epistemology in the 21st is quite different from that which preceded it. Surveys are now carried out with increasing frequency on an ever-widening range of topics challenging both the theories that rested on intuitions about the nature of knowledge and ideas about the relationship epistemology has to empirical methods. X-ep claims that results from psychology and cognitive science can inform issues in epistemology. Many bold, and some less bold, claims have been made based on the results of these surveys. The following factors have been investigated as possible influences on epistemic intuition. Also included in the following are replication successes and failures where applicable:

- *Age*. Colaco, Buckwalter, Stich, and Machery (forthcoming) report that, contra received opinion in epistemology, participants do attribute knowledge in fake-barn cases. They also found that this intuition is negatively correlated with age i.e. older participants are less likely to attribute knowledge.
- **Socioeconomic status**. Weinberg, Nichols, and Stich (2001) report that participants of low SES are more likely to attribute knowledge across a range of cases. Seyedsayamdost (2013) failed to replicate these results.

- **Gender**. Buckwalter and Stich (2013) report that women are more likely than men to agree that the agent knows that he is not a virtual-reality brain in the Brain-in-a-Vat case and in Gettier cases. Seyedsayamdost (2012) and Adleberg, Thompson, and Nahmias (forthcoming) failed to replicate these results. Buckwalter and Stich (2013) report that men are more likely to attribute knowledge in physicalism thought experiments like Jackson's Mary case and are more likely to attribute understanding to the computational system in Searle's Chinese Room thought experiment. (Jackson 1986) Seyedsayamdost (2012) and Adleberg, Thompson, and Nahmias (forthcoming) failed to replicate these results.
- *Error salience*. Buckwalter (2010) reports that, contra contextualism, participants are not significantly less likely to attribute knowledge when the possibilities for error are made more salient to them. Buckwalter (forthcoming) replicates these results and similar results were found by Feltz and Zarpentine (2010), May, Sinnott-Armstrong, Hull, and Zimmerman (2010), and Schaffer and Knobe (2012).
- **Moral judgment**. Beebe and Buckwalter (2010) report that participants are more likely to attribute knowledge to someone who causes a bad side-effect than a good one. They term this the Epistemic Side-Effect Effect; a corrolary of the Knobe Effect. (Knobe 2003a, 2003b, 2004a) Beebe and Jensen (2012) replicate this effect and demonstrate similar effects for aesthetic and prudential wrongness. Alfano, Beebe, and Robinson (2012) and Turri (forthcoming) also replicate these results.¹³ Beebe and Shea (2013) report that participants are more likely to attribute knowledge in Gettier cases when the agent is performing actions that are harmful/blameworthy than when she is performing helpful/praiseworthy or morally neutral actions.
- *Mother tongue*. Vaesen, Peterson and Van Bezooijen (2013) report that the first language of participants affects their intuitions about knowledge attribution.
- *Philosophical training*. Weinberg, Nichols, and Stich (2001) found substantial differences between the intuitions of participants who had taken no philosophy courses and participants who had taken three or more in skeptical scenarios such as the Brain-in-a-Vat case.
- **Pratical stakes**. Pinillos (2012) reports that knowledge attributions vary according to what is at stake for the protagonist. Buckwalter (forthcoming) and Buckwalter and Schaffer (forthcoming) replicate these results.

Many of these factors are also investigated in x-phi more generally where a wide range of factors have been reported to influence particpants' intuitions including *age* (Beebe and Sackris under review) and *personality traits* such as extroversion and introversion, emotional stability, neuroticism, and openness to experience (Cokely and Feltz 2009, 2011; Feltz 2013; Feltz and Cokely 2008, 2009, 2012, forthcoming; Feltz, Perez, and Harris 2012; Shultz et al 2011), as well as certain 'non-truth-conducive' factors such as pragmatic factors, moral judgment, performance errors, and demographic variation. (Buckwalter 2012) Could culture also be a factor and in what sense?

Studies have also been carried out to investigate culture as a factor. Often, this research uses psychological research into cultural variation as a template which can be applied to epistemological issues (e.g. Machery et al. 2004). Extensive research in psychology and cognitive science, though by no means conclusive and uncontroversial, suggests that matters of human reasoning that had previously been thought to be near universal may vary across geographical divides. The 'East-West' divide – a category that opposes so-called Eastern countries and cultures such as China and India and so-called Western ones such as the U.S. and the U.K. – has been a particularly well-trammelled path. Researchers have investigated differences between modes of reasoning (Norenzayan et al. 2002; Nisbett 2003; Nisbett, Peng, Choi, and Norenzayan 2001; Norenzayan et al. 2002); attention and perception (Chua et al. 2005; Ji, L. et al. 2000; Kitayama 2003;

¹³ See Buckwalter 2013 for further discussion.

Masuda and Nisbett 2001; Nisbett and Miyamoto 2005); causation (Norenzayan and Nisbett 2000; Peng and Knowles 2003); rule-based and association based reasoning (Nisbett 2003); and language acquisition (Gopnik and Choi 1995). The motivation behind experimental philosophy is that (philosophical) intuitions should also be so studied and often this psychological research as a template.

Such research has prompts us to ask whether there has been a 'Western bias' in philosophy. Analytic philosophy, after all, is a discipline practised almost exclusively in North American, Australasian, and European (i.e. Western) universities. Any intuitions relied upon without the kind of psychological research detailed above draws upon a predominently Western base. This presents a problem since we cannot, prima facie, assume that Western people are representative of the species as a whole; a problem that has been well-described elsewhere. In their paper, 'The Weirdest People in the World,' Joe Henrich, Steven Heine, and Ara Norenzayan highlighted the problems with relying solely on North American test subjects in psychological experiments – or WEIRD (Western Educated Industrialised Rich Democratic) people, as they call them. Henrich had earlier tested behavioural experiments from economics on the Machiguenga, an indigenous people living north of Machu Picchu in Peru. His experiment provides a neat illustration of just how easily reasoning practices can diverge. The 'game' he used was a variation on the prisoner's dilemma. In the game, one player is given an amount of money and told that he has to offer some of it to the other player. The second player can either accept or refuse the offer. However, if the second player refuses the offer, both players get nothing. He found that US participants generally offer an even split when they are the 'giver' and tend to punish the other player if the split is uneven when they are the 'receiver'. The results for the Machiguenga were radically different. When giving, players would offer much lower sums and when receiving they would almost never turn down any offer. After trying the experiment in various other smallscale countries he found even more variety. For example, in some societies where gift-giving is frequently used to fain favour and allegiance, the 'giver' would often make very generous offers and the receiver would often reject them. One could imagine that Western economists unfamiliar with such examples would base their theories on the assumption that most people offer even splits in such scenarios and punish others when they do not offer even or 'fair' splits. This, however, would be based on the behaviour of Western homo economicus but would not generalize to human behaviour in general. Could philosophers be similarly biased in their analyses?

Machery, Mallon, Nichols, and Stich (2004), in a brief article for *Cognition*, report that Western and East Asian participants differ in their semantic intuitions. Specifically, they found that Western participants are more likely than East Asian participants to report intuitions that are consistent with a causal-historical than a descriptivist view of reference. They presented participants with two thought experiments derived from Saul Kripke who had used the intuition method to refute descriptivist theories of the reference of proper names.¹⁴ Machery et al. had observed that some cross-cultural research suggests that East Asians are more likely to make categorical judgments on the basis of similarity than Westerners and that Westerners are more likely to focus on causation in describing the world and classifying things. (Machery et al. 2004, B5; Norenzayan, Smith, and Kim 2002; Watanabe 1998) Given that this research showed that Westerners have a greater tendency to make causation-based judgments, they predicted that Westerners would be more

¹⁴ This refers to an old debate in philosophy of language about how we use words to refer to people, places, and the like. Briefly, descriptivist accounts are those that claim that competent speakers associate a description with every proper name; that this description specifies a set of properties; and that an object is the referent of a proper name if and only if it uniquely or best satisfies this description. (Machery et al. 2004, B2. See also Lewis 1970; Searle 1958) When someone calls me 'Eric' they mean the individual who fits a list of descriptive statements that are true about me: born in Scotland, lives in Singapore, wrote this article, and so on. An alternative, the causal-historical view, takes a different approach. It says that when I was first named 'Eric' by my parents this began a causal chain of successive users each of whom learnt my name from a previous user. I am referred to as 'Eric' because that is what my parents named me and every other user is following on that tradition. Kripke is today generally thought to have refuted the descriptivist account by the use of several key thought experiments. As we have discussed above, this method of argument relies on the shared intuition that the thought experiment is inconsistent with the traditional (in this case, descriptivist) account. If such intuitions are not shared, the argument would appear to be weakened.

likely to respond in accordance with causal-historical accounts of reference, and East Asians would adopt a descriptivist account. To test this hypothesis, Machery et al. presented participants with a number of thought experiments derived from Kripke.¹⁵ They found that, in one type of thought experiment at least, East Asian participants tended to have descriptivist intuitions, while Westerners tended to have Kripkean ones. Beebe and Undercoffer (forthcoming, 2016) replicates these results.¹⁶

One of the earliest studies in x-ep focused on intuitional variation between East Asians, Westerners, and participants from the Indian subcontinent. Weinberg, Nichols, and Stich (2001) found striking results in cross-culural tests that spurred a great deal of research. They found that Western participants were more likely than East Asians to attribute knowledge in Truetemp cases,¹⁷ although both were likely to deny knowledge unless the mechanism responsible for the true belief was shared amongst everyone in the community, in which case East Asians were more likely to attribute knowledge. Further, they found that East Asians and participants from the Indian subcontinent were more likely to attribute knowledge in a number of Gettier cases and that participants from the Indian subcontinent were more likely to attribute knowledge in the Cancer Conspiracy case.¹⁸ One case involved the following thought experiment:

(O) Bob has a friend, Jill, who has driven a Buick for many years. Bob therefore thinks that Jill drives an American car. He is not aware, however, that her Buick has recently been stolen, and he is also not aware that Jill has replaced it with a Pontiac, which is a different kind of American car.

Does Bob really know that Jill drives an American car, or does he only believe it? (Weinberg et al. 2001)

Their results showed that East Asians did not share the intuition of Euro-Americans that Bob lacked knowledge. Cultural variance in epistemic intuitions has also been discussed in Turri (2012); Starmans and Friedman (2012); and Cullen (2010) who report that Western participants' tendencies to attribute knowledge in Gettier cases differ from non-Western participants. At the outset, we should note that Weinberg et al.s' results have not been replicated in several attempts.

We can see that there are claims that many factors can affect epistemic intuitions (just as these factors may affect semantic and moral intuitions) but also many instances of failed replication. As things stand, it is difficult to know what, if anything, underlies these varying results and whether the initial prediction – that epistemic intuitions vary – is borne out by the research. Some research from x-phi has shown certain judgments are more robust. Beebe, Runya, Wysocki, and Edara (forthcoming, 2015) report that Chinese, Polish, and Ecuadorian participants attributed ethical statements in similar patterns. Non-national factors – the participants' strength of opinion about an issue, the level of societal agreement or disagreement, and participants' age – were found to 'significantly affect their inclination to view the truth of an ethical statement as a matter of objective fact. So whilst there could be some cultural influence, non-cultural factors may play a larger role. Intra-cultural factors – differences within national boundaries, for example, as well as between national groupings – would also have to be studied to demonstrate that such factors are less influential. In the next section, I'll look at possible reasons why the results are so mixed.

¹⁵ See Annex M for one example.

¹⁶ Sytsma and Livengood (2011) and Lam (2010), using a different methodology, failed to replicate these results. Cf. Machery, Deutsch, Mallon, Nichols, Sytsma, and Stich (2010) and Machery, Olivola, and De Blanc (2009).

¹⁷ Adapted from Lehrer (1990), see Annex (Q).

¹⁸ See Annex N.

Limitations of X-Ep Method I: Surveys

One answer is that the lack of conclusive results derives from limitations in the methodology of x-ep. The limitations of survey methods are, of course, well known within pyschology and other disciplines that make use of them. They also suffer from problems particular to philosophy, as outlined in Kauppinen (2007). Simon Cullen (2009) succinctly describes some of the limitations of the x-phi method.¹⁹ X-phi depends, in the main, on surveys but one cannot simply 'read off' intuitions from survey responses. What people say does not necessarily equal what they think. Whilst that is fairly straightforward we might reply that survey responses have a quality of verisimilitude.²⁰ However, sociologists and psychologists have developed extensive methods and procedures for being extremely careful about how examples are used, questions are framed, and the setting in which questions are asked to aim towards verisimilitude. This careful preparation has not always been followed in x-phi and x-ep. Cullen provides an illuminating demonstration of the potential pitfalls experimenters can run into using one of Weinberg et al.s' vignettes (2006):

(P) Dave likes to play a game with flipping a coin. He sometimes gets a "special feeling that the next flip will come out heads. When he gets this "special feeling", he is right about half the time, and wrong about half the time. Just before the next flip, Dave gets that "special feeling", and the feeling leads him to believe that the coin will land heads. He flips the coin, and it does land heads. Did Dave really know that the coin was going to land heads, or did he only believe it?

Cullen notes that the words special feeling are consistently enclosed in quotation marks. It is unclear to a reader whether Weinberg et al. are implying that *special feeling* is a quote from Dave or that they intend to introduce a degree of skepticism around the idea, as in, 'so-called' special feelings. The latter may bias many readers against the idea that Dave knows anything on the basis of this feeling. The second point Cullen observes is that the phrase 'really knows' may, for many readers, imply that 'knows' in this case has a very high standard – Dave doesn't just know, he really knows. Conversely, 'only knows' may lower the standard required for answering the Dave believed, but did not know, the proposition. The really/only distinction is not just used by Weinberg et al. but is fairly standard across the literature on Gettier case intuitions. Even proposing knows and believes as the only two possible options already seems to bias the reader towards a particular reading of the case. Cullen argues that x-philosophers are committed to the view that 'people's philosophical intuitions are implanted within them in some way, and by administering simple surveys we can discover them' (Cullen 2009). Cullen is right to point out that x-philosophers have often been too ready to jump on the results of their experiments as 'straightforward data' (Knobe 2006, p. 205) or 'brute facts' (Weinberg et al. 2006, p. 215) but we could read this as eagerness rather than naivety. X-philosophy has often assumed that intuitions are implanted in the way that Cullen describes but it does not seem that it has to, as I show later, when the methodology is expanded.

Other incidental elements of the set-up of an experiment have been shown to influence participants' responses including the *order* in which examples are presented (Swain et al. 2008), *font type* (Gonnerman, Reuter, and Weinberg 2011) and *environmental factors* such as cleanliness (Helzer and Pizarro 2011). Particularly when participants do not share a language, there are likely to problems of comprehensibility and translation. The scenarios that philosophical thought experiments use can be quite removed and abstracted from the kind that people are used to thinking about. Further, this disconnect can be compounded in translation. It is difficult to know in some cases whether the scenario is properly understood by the participant although experimenters can test this to an extent. Subtle contextual differences may emerge when transplanting scenarios from one culture to another. For example, to use (O) from Weinberg et al., if we were to simply translate the scenario for Japanese speakers, participants may

¹⁹ This has been discussed extensively in experimental psychology literature. See, e.g., Schwartz 1995, 1996.

²⁰ That is, they approximate or approach the truth.

be influenced by the fact that few people in Japan drive American cars and so the situation is unlikely.²¹ More fundamentally, answering questions often relies on understanding or presuming what the questioner wants. If the responder misunderstands this, as is quite likely with philosophical problems, then their response will be affected. These are elements of the survey method that are tricky to control and pose specific problems for philosophers.

A good example of the subtle linguistic problems that can arise when conducting surveys in philosophy is described by Melody Dye (2010). Specifically, she describes lexical priming as a potential worry for experiments in x-phi i.e. the idea that participants will give differing responses to these kinds of thought experiments depending on the kinds of words we are primed to expect. For example, she asks us to consider the following question:

Next Wednesday's meeting has been moved ahead two days. Which day is it on now?

Here, the answer could be either Monday or Friday depending upon how 'moved ahead' is interpreted. As a comparison of this kind of lexical priming, describes an experiment in which participants were asked to read sentences that were identical but for a changed motion verb.

The road *comes* all the way from New York. The road *goes* all the to New York.

They were then asked the ambiguous question above. Participants who had just read the 'comes' sentence tended to choose Monday, whilst those who had read the 'goes' sentence tended to choose Friday. Linguists can then look up the words 'comes' and 'goes' to see what other kinds of words are typically seen in tandem. It turns out that when we use the word 'comes' we tend to accompany it with past-looking words like 'earlier', 'sooner' or 'before'. When we use 'goes' we tend to accompany it with future-looking words like 'later' or 'after'. We are therefore primed to expect past-looking words to follow 'comes' and future-looking words to follow 'goes' even before we've read the sentence. Dye shows that similar biases exist for 'harms' and 'helps' and that this could explain differences in judgment in famous x-phi cases such as those demonstrating the Knobe effect.

Experimenters are able to probe participants' intuitions to an extent, but it always has to be pre-meditated and the number of permutations is limited. For example, in Weinberg et al's study, they presented participants with a few 'tweaks' of the initial Truetemp case. In the first instance, they changed the mechanism responsible for the protagonist's lucky ability from a rock falling on his head to a 'socially sanctioned intervention.²² (Weinberg et al. 2001, p. 16) In this tweak, the protagonist is 'knocked out by a team of well-meaning scientists sent by the elders of his community.' (ibid.) They found that the stark difference observed between Westerners and East Asians was reduced. In a second tweak, they described a mechanism that was not unique to a single individual but shared by everyone in the community.²³ Curiously, in this case, East Asians were *more* likely than Westerners to ascribe knowledge.

Limitations of X-Ep II: WEIRD Epistemology and the East-West Dichotomy

Nevertheless, psychologists continue to rely on survey methods in their experiments and so should it not be possible to refine the method for philosophy? There is a further general problem with the assumptions behind such studies as they might apply to epistemology that may explain why some of these experiments are being replicated and some are not. We are asked to assume that there are some fundamental

²¹ My thanks to Michael Slote for pointing out this possibility.

²² See Annex Q.

²³ See Annex R.

differences in culture between 'the West' or 'Euro-American' and 'East Asia'. But what could be the underlying mechanism that would explain differences in epistemic intuition across people so diverse as, on the one hand, to come from China, Japan, India, and South Korea, etc. and, on the other hand, the US, Canada, Australia, Europe, etc. We are at an early stage in working out exactly what the underlying mechanisms are in epistemic intuition but it seems improbable that such factors would divide across such essentialized lines, especially one that has been so extensively critiqued.²⁴

When x-phi and x-ep talks about cultures they can mean a number of different kinds of groups. 'Culture' can be a synonym for place of birth (or place of parent's birth), for the place where one's mother tongue is spoken or for the place where one grows up as a child. It can be very broad, e.g. 'Asian', or more narrow, e.g. 'Glaswegian'. Weinberg et al., for example, conducted experiments in Asia and the United States for some of their experiments but, for others, they used East Asian students studying in the U.S. or first and second generation East Asian immigrants to the United States. The Western participants were 'Americans of European ancestry' (Weinberg et al. 2001, fn. 19). Representatives from all Asian or Western countries can rarely be found and so, for example, Weinberg et al. (2001) rely on Chinese, Japanese, and Korean participants to represent 'East Asia'. It is not at all clear here, given such varying categories, what 'cultural variation' refers to. We must assume, for example, that it is something that individuals pick up after 17 or 18 years of age and carry with them when they travel abroad. In addition, it must be something that is imparted from parent to child and that the child picks up the culture of the parent, not of the place where they live and grow up. In Machery et al., results are extrapolated from Hong Kong undergraduates to represent the East Asian category, whilst U.S. undergraduates represent Westerners (Machery et al. 2004, B2).²⁵ They are aware of the problem. In a footnote they write,

There is a common concern that the labels 'East Asian' and 'Western' are too rough to do justice to the enormous diversity of cultural groups such labels encompass. We are sympathetic to this concern. However, the crudeness of these groupings does nothing to undermine the experiment we present. On the contrary, if we find significant results using crude cultural groupings, there is reason to believe more nuanced classifications should yield even stronger results.

(Machery et al. 2004, fn. 9)

In other words, the assumption is that variation in crude cultural groupings (CCG) entails variation between a subset of one CCG and another. However, it is not clear in what way we should expect this to manifest in epistemic intuition. Variations might be more likely to be the result of sampling quirks than actual difference. We have already seen that a great number of factors may affect epistemic intuition (age, gender, socioeconomic status, philosophical training, language spoken, and so on). Professional experience or religious background factor into culture. If these factors do influence epistemic intuitions then this will muddy any picture derived from CCGs since such factors can be represented differently in different cultures. Using these CCGs, we cannot know whether it is 'East Asian culture' that is responsible for the difference in intuition or whether it is socioeconomic status or philosophical training or a mixture of any number of other factors. Non-cultural factors could be muddying the picture, making any cultural differences harder to see using such methods. None of this is to say that culture is a useless category, as will be seen in the following section, but only to say that a finger-grained tool may be needed to 'cut the joints' of epistemic intuitions. Experimental epistemologists need to think carefully about culture and how to approach it. The following examples suggest possible paths through this terrain.

²⁴ See, for example, Hendry and Wong 2006.

²⁵ They use the same ethnic identification questionnaire that Richard Nisbett and his colleagues used in the research described above.

CROSS-CULTURAL EPISTEMOLOGY

The method x-phi employs is new but the kind of argument they appeal to has a longer history in epistemology. Cross-cultural epistemologists have long argued that we ought to reconsider the legitimacy of a method that involves extrapolating from one's own intuitions about knowledge to general claims about the nature of knowledge. They have suggested that epistemology ought to look further afield to epistemology practised outside of the U.S., Europe, and Australia, and to take seriously folk epistemology in general. Some steps towards this more fine-grained exploration have been carried out under various guises including ethnoepistemology and anthroepistemology which I will broadly refer to as cross-cultural epistemology.

In cross-cultural epistemology, a great many cultures, societies, and religions have been studied using sociological, historical, psychological, and anthropological, as well as philosophical methods. Aztec (Maffie), Native American (Maffie, Waters, Hester, Cheney), Indo-Tibetan (Hugon, Stoltz, van der Kuijp), Buddhist (Ole 1991, Matilal, Evans), Chinese (Cua), Indian and Ancient Indian (Chakrabarti, Phillips, Sukharanjan, Chakravarthi, Potter, Bhatt, Freschi), African (Hallen and Sodipo, Òkè, Hamminga, Oruka), and Maori (Salmond). Some look at epistemic practices of all people of the particular group studied. Some look at what can be called reflective epistemologies: the thoughtful, considered reflections of thinkers, theorists, scientists, doctors, and so on. Some have conducted a sociology of philosophers, detailing the practices of historical and living philosophers, distinguishing from and comparing with their Western co-professionals, such as Jonathan Stoltz who has uncovered Gettier-like experiments in the Indo-Tibetan tradition. Others, such Hallen and Sodipo have looked at particular ways in which knowledge forms part of the grammar of particular languages and contend that the Yoruba in West Africa lack equivalent terms for belief and knowledge. Others discuss whether non-Western epistemologies can be framed in terms of justified true belief, such as Karl Potter's research on Indian epistemology and others still analyze epistemological concepts such as understanding, testimony, doubt, and belief, to non-Western groups (Chakrabarti and Matilal 1994; Phillips 2012, 2015; Scharfstein 2001). One of the benefits of this research is not just in illuminating issues that experimental epistemology has addressed but in drawing our attention to the broad variation in folk and reflective epistemology across cultures.

Sometimes, epistemologists have found that non-Western epistemic practices and intuitions seem to be in conflict with contemporary Western ideas. Soraj Hongladarom, for example, has written on Thai epistemology using the work of the Dutch anthropologist, Neils Mulder, which he argues is incompatible with veritistic epistemology and the maxim to 'seek truth and avoid error' (Hongladarom 2002, Mulder 2000). Mulder's description of the concept of knowledge in Thailand begins with the influence of Buddhist teachings that emphasize memorization and rote-learning. Knowledge becomes separated from understanding; a 'thing to possess, an arsenal of rules and recipes that are formal and static... a thing to display [that] has primarily a social function. To have relatively more knowledge entitles one to equivalently more respect and position, and, correspondingly, people in higher positions are thought to have knowledge—or at least they are expected to behave as if they know.' (Mulder 2000, p. 140-1) According to Mulder, truth is not the ultimate goal in Thailand but instead is 'subordinate to the hierarchical social system where the *phuujaj* [elders] are perceived to be superior in knowledge,' even though what they believe is false. Of course, such a claim is highly controversial. Perhaps social norms are overriding perceived epistemic norms. However, we can suppose that, whether or not it is true of Thailand, it is logically, nominally, and psychologically possible. What Hongladarom and Mulder succeed in doing is in illustrating how such an alternative society might operate.

CONCLUSION

The take-home messages of this paper are two-fold. First, failure of psychological experimental epistemology is not failure of experimental epistemology *per se*. Second, an alternative or expanded methodology can include sociological methods in conjunction with existing methods of experimental epistemology. In part, this project is already under way within the guise of cross-cultural epistemology. Bringing the two into conversation with one another results in a finer understanding of the issues. Interdisciplinary work between sociology and philosophy has been limited but experimental philosophy would seem to be an ideal candidate for such cross-pollination. Of course sociologists and anthropologists have frequently engaged with questions of knowledge, truth, and value, creating subdisciplines within their own fields in which to conduct such research. There is also some history of epistemologists engaging with the sociology of knowledge. Martin Kusch, in particular, has developed a communitarian epistemology out of the engagement between the Strong Programme in sociology of scientific knowledge and contemporary debates in epistemology around testimony, foundationalism, and contextualism (Kusch 2002, Cf. Maffie 1999).

Even amongst those who have called for a 'broad conception' of x-phi, the methods only reach as far as psychology and cognitive science (Rose and Danks 2013). What is particular about these disciplines is that they are what we might call individual sciences (as opposed to social sciences). They tend to investigate knowledge from the perspective of individual organisms, not as social beings embedded in social contexts. Individualistic approaches are ill-equipped to understand culture, a concept more ably addressed by sociology, anthropology, and so on. Widening the methods of empirical epistemology to include sociological methods also raises questions about whether the traditional instruments of analytic epistemology can answer questions that are so culturally-embedded. Gettier intuitions appear, prima facie, to be relatively culturally robust but interpreting ancient texts and translating contemporary ones are fraught with indeterminacy and misunderstandings. Historians and linguists could, no doubt, be of help in reducing these concerns but it may also be that the thought experiment is too crude a tool with which to understand culturally-variable epistemic concepts. Once again, broadening the methods of experimental epistemology allows researchers to escape the narrow confines of the intuition pump. This is not an argument in itself for doing x-ep. It is not an argument that folk epistemic intuitions, or non-Western epistemological intuitions, have implications for Western analytic epistemology. It is an argument that, if we are sympathetic to x-ep's guiding motivations, then we ought to expand what the 'x' stands for. It may turn out that some, or even all, of the early experiments in x-ep - such as that carried out on Gettier intuitions in Asian and Western populations - are not replicated across a wide range of cases (Boyd and Nagel 2013; Kim and Yuan forthcoming).

I have argued that Stich's motivating principle is sound: it is psychologically possible that the society he imagines exists. Cross-cultural epistemologists, sociologists, historians, and anthropologists, imagine and investigate such a possibility, giving us grounds to doubt the anthropological constancy of particular thought experiments in epistemology as well as the conceived notion of cultural variation. The current solution that has found the most traction in the literature is experimental epistemology but it relies on a limiting method based on surveys and thought experiments that may not be equipped to get at the phenomena in question. Consequently, x-ep ought to embrace sociological methods and physically go into the societies they are interested in - as sociologists and anthropologists do - or, at the least, enter into a conversation with this research and understand, in a deeper and more nuanced way, the particular epistemological practices therein (Kerr 2013, 2014). They would not need to assume that participants understood esoteric thought experiments because the discussions they would have would be related to lived practice. It seems likely – although we do not know until the research is carried out – that there will be cultural variation across some issues, and less across others. Gettier intuitions, for example, seem pretty robust, although the robustness may come, to a significant extent, from the specific framing which they are given and the way in which it leads the reader towards a particular conclusion. It may be that there are two possible responses to Gettier cases. The first is to understand the problem and why the case is being

considered, and so to also grasp the assumed different between 'really knowing' and 'only believing'. The second is to not understand the problem or why the case is being considered. Anecdotally, in my own conversations with people who have grown up far from any Western philosophy department, the confusion and perplexion surrounding the Gettier case has overridden any meaningful answer to the question it poses. Consider the example in Annex L. Sometimes people think that I must be implying some magical connection between the coins in someone's pocket and getting the job. Since such a connection would be very strange they simply do not see the point in asking the question. Other times people are conflicted between both answers. In other words, it is not clear to them whether the person knows or only believes. Neither of these possible responses can be captured in a simple survey. One can only get them through extended conversation, listening, contextualization, and through understanding the cultural implications contained in almost any thought experiment. Attitudes towards epistemic virtues, responsibility, and other normative areas may be much more variable. This paper presents a way forward beyond the confines of current experimental epistemology that is in accord with the discipline's initial manifesto but overcomes the shortcomings in cultural definition and methodology. If the initial call was for philosophers to abandon the armchair and embrace the empirical methods of neighbouring disciplines, then walking down the corridor to the psychology department is but the first step on such a journey.

ANNEX

(C) Suppose I close my palm and ask a gambler, 'How many dice do I have in my palm?' The gambler replies, 'Five.' And five it is. (12th century Indian philosopher, Sriharsa, in Matilal 1986, p. 136)

(D) Socrates: If a man knew the way to Larissa, or any other place you please, and walked there and led others, would he not be a good guide?

Meno: Certainly.

Socrates: And a person who had the right opinion as to which was the way, but had never been there and did not really know, might also be a good guide, might he not?

Meno: Certainly. (Classical Greek philosopher, Plato, Meno 97a-c. Cf. Theaetetus 200d5-201c7)

(E) Suppose *A* has stolen something, and the police have got the suspect. Now two persons, *B* and *C*, come along to testify. *B*, who does not *know*, tells, simple out of malicious intent, that he has *seen A* in the act. And *C*, who has actually seen *A* in the act, says the same thing. The content of the belief of the police or the judge in both cases would be the same. But if the judge inflicts punishment on the basis of *B*'s testimony rather than *C*'s, we would feel that something has gone wrong. (A re-contextualisation of 6th century Indian philosopher, Candrakirti, in Matilal, p. 104)

(F) *S* looks at a clock and forms a true belief as to the time of day. *S* has every reason to believe that the clock is working well, but in fact it has stopped. (Scheffler 1965, following 20th century British philosopher, Bertrand Russell 1948)

(G) Suppose somebody misperceives a cloud of dust as a line of smoke and consequently infers that there is a body of fire in the field beyond. Further suppose there is actually a body of fire there with or without smoke, but the person's inference happens to be based upon a misperception. (Sriharsa in Matilal 1986, p. 136)

(H) You take your son to the zoo, see several zebras, and, when questioned by your son, tell him they are zebras. Do you know they are zebras? Well, most of us would have little hesitation saying that we did know this. We know what zebras look like, and, besides, this is the city zoo and the animals are in a pen clearly marked "Zebras." Yet, something's being a zebra implies that it is not a mule and, in particular, not a mule cleverly disguised by the zoo authorities to look like a zebra. Do you know that these animals are not mules cleverly disguised by the zoo authorities to look like zebras? (Dretske 1970, p. 1015-16. Cf. Kerr and Pritchard 2012, p. 195-7 and Weinberg, Nichols, and Stich 2001, p. 23 for related formulations)

(I) You see Plato running right past you. Unfortunately, you mistake him for Socrates and you form the confident belief that Socrates is running, based on what you have seen. As it happens, just at this very moment Socrates *is* running, in a distant city. (14th century Italian philosopher, Peter of Mantua, in Boyd and Nagel, p. 109. Cf. Boh 1985)

(J) [S]uppose one (correctly) identifies an object at a distance as a cow by looking at a piece of cloth around the neck of the cow and mistaking it for the actual dewlap. (Sriharsa in Matilal 1986, p. 136)

(K) Mary enters the house and looks into the living room. A familiar appearance greets her from her husband's chair. She thinks, 'My husband is home,' and then walks into the den. But Mary misidentified the man in the chair. It is not her husband, but his brother, whom she had noreason to think was even in the country. However, her husband was seated along the opposite wall of the living room, out of Mary's sight, dozing in a different chair. (Turri 2012, adapted from 20th century American philosopher, Linda Zagzebski, 1996, p. 285-6)

(L) Alice recently applied for a job. Her boss, who is in charge of hiring the successful applicant, told her that another candidate, Carol, will get the job. Alice forms the (justified) belief that Carol will get the job. She also saw Carol put ten coins in her pocket. She thus (justifiably) forms the belief that 'the successful applicant has ten coins in her pocket.' It turns out that Carol does not get the job, Alice does. As it happens, Alice also, unknowingly and by sheer chance, has ten coins in her pocket. Her belief that 'the successful applicant has ten coins in her pocket' is thus justified and true. (My own paraphrase of 20th century American philosopher, Edmund Gettier, 1963)

(M) Ivy is a high-school student in Hong Kong. In her astronomy class she was taught that Tsu Ch'ung Chih was the man who first determined the precise time of the summer and winter solstices. But, like all her classmates, this is the only thing she has heard about Tsu Ch'ung Chih. Now suppose that Tsu Ch'ung Chih did not really make this discovery. He stole it from an astronomer who died soon after making the discovery. But the theft remained entirely undetected and Tsu Ch'ung Chih became famous for the discovery of the precise times of the solstices. Many people are like Ivy; the claim that Tsu Ch'ung Chih determined the solstice times is the only thing they have heard about him. When Ivy uses the name "Tsu Ch'ung Chih", is she talking about:

(a) the person who really determined the solstice times? or

(b) the person who stole the discovery of the solstice times? (Machery et al. 2004, B9-10)

(N) It's clear that smoking cigarettes increases the likelihood of getting cancer. However, there is now a great deal of evidence that just using nicotine by itself without smoking (for instance, by taking a nicotine pill) does not increase the likelihood of getting cancer. Jim knows about this evidence and as a result, he believes that using nicotine does not increase the likelihood of getting cancer. It is possible that the tobacco companies dishonestly made up and publicized this evidence that using nicotine does not increase the likelihood of cancer, and that the evidence is really false and misleading. Now, the tobacco companies did not actually make up this evidence, but Jim is not aware of this fact. Does Jim really know that using nicotine doesn't increase the likelihood of getting cancer, or does he only believe it? (Weinberg, Nichols, and Stich 2001, p. 251)

(Q) The Faluki are a large but tight knit community living on a remote island. One day, a radioactive meteor strikes the island and has one significant effect on the Faluki – it changes the chemical make-up of their brains so that they are always absolutely right whenever they estimate the temperature. The Faluki are completely unaware that their brains have been altered in this way. Kal is a member of the Faluki community. A few weeks after the meteor strike, while Kal is walking along the beach, the changes in his brain led him to believe that it is 71 degrees where he is. Apart from his estimation, he has no other reasons to think that it is 71 degrees. In fact, it is at that time exactly 71 degrees where Kal is. (Weinberg et al. 2001, p. 17)

(R) One day Charles is suddenly knocked out by a falling rock, and his brain becomes re-wired so that he is always absolutely right whenever he estimates the temperature where he is. Charles is completely unaware that his brain has been altered in this way. A few weeks later, this brain re-wiring leads him to believe that it is 71 degrees in his room. Apart from his estimation, he has no other reasons to think that it is 71 degrees. In fact, it is at that time 71 degrees in his room. (Weinberg et al. 2001, p. 16)

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