Gettier Across Cultures[1]

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In this article, we present evidence that in four different cultural groups that speak quite different languages (Brazil, India, Japan, and the USA) there are cases of justified true beliefs that are not judged to be cases of knowledge. We hypothesize that this intuitive judgment, which we call "the Gettier intuition," may be a reflection of an underlying innate and universal *core folk epistemology*, and we highlight the philosophical significance of its universality.

1. Introduction

For much of the history of Western philosophy, the dominant account of knowledge was that knowledge is justified true belief. But in a short paper published

in 1963, Edmund Gettier challenged this traditional account by offering a pair of hypothetical counter-examples. Each of these recounted the situation of a person who, Gettier maintained, had a justified true belief in a proposition, but who did not know that proposition. He concluded that having justified true belief is not sufficient for having knowledge. Most philosophers who read Gettier's paper agreed that these cases posed a serious problem for the justified true belief (JTB) account of knowledge, and before long the philosophical literature was flooded with additional hypothetical cases in which, it was claimed, a protagonist had a justified true belief in a proposition but did not know that proposition. The term *Gettier case* soon became common in philosophy, and while there is no universally accepted definition, it is often used for any case in which it seems clear to many philosophers that a protagonist has JTB but does not have knowledge. That is how we will use the term here. We will use the term *Gettier intuition* for the judgment or intuition that a protagonist in a Gettier case does not know the relevant proposition.

The first reaction to the discovery of Gettier cases was an attempt to formulate some additional condition or conditions that, when conjoined with justification, truth and belief would yield an account of knowledge that was not challenged by Gettier style counter-examples. This approach led to dozens of proposals, none of which have been widely accepted. (For a detailed overview of early efforts, see Shope, 1983.) More recently, philosophers have explored a wide variety of other reactions to Gettier cases, and some (notably Zagzebski, 1994 and Williamson, 2000) have argued that Gettier cases show that the concept of knowledge cannot be successfully analyzed at all.

A new element was introduced into the debate when Weinberg and colleagues (2001) used the methods of "experimental philosophy" to explore whether judgments (or "intuitions") about Gettier cases vary across demographic groups. They reported that, by and large, university student participants with Western cultural backgrounds shared philosophers' intuition that the relevant beliefs of protagonists in Gettier cases are not cases of knowledge, but that a majority of participants with East Asian and South Asian cultural backgrounds did not share those intuitions. This led to a lively and ongoing debate about the implications of demographic variation in lay people's intuitions about epistemological thought experiments, and philosophical thought experiments more generally. A main focus of this debate has been the "method of cases" which uses intuitions about hypothetical cases as evidence in evaluating analyses of philosophically important concepts, like the concept of knowledge, and accounts of philosophically important phenomena (Alexander & Weinberg, 2014; Cappelen, 2012; Jackson, 2011; Machery, 2011; Nagel, 2012; Sosa, 2007, 2009; Stich, 2009, 2013; Stich & Weinberg, 2001; Weinberg, 2007; Williamson, 2007, 2011).

Of course, the debate would be of little interest unless different demographic groups really do have different intuitive reactions to Gettier cases and other philosophical thought experiments. And research on this issue has been far from conclusive. As noted earlier, Weinberg et al. (2001) found that a majority of their East Asian and South Asian participants did not share the predominant Western intuition that Gettier cases are not instances of knowledge. But Turri (2013)

reports that, when Indian participants recruited on Amazon Mechanical Turk were presented with one of Weinberg et al.'s Gettier cases in stages (instead of all at once), 85% of participants reported the Gettier intuition—they indicated that the protagonist did not have knowledge. Starmans and Friedman (2012) found that lay people, in contrast with philosophers, *do* ascribe knowledge in many, but not all, of the Gettier cases they tested. By contrast, Nagel and colleagues (2013a) maintain that lay people are in general *un*willing to ascribe knowledge in Gettier cases. They also tentatively report being unable to find any difference between ethnic groups in their sample of participants (for additional discussion, see Starmans & Friedman 2013 and Nagel et al. 2013b; for further evidence on epistemological thought experiments, see Turri, Buckwalter, & Blouw, 2015; Powell, Horne, & Pinillos, 2014; Powell, Horne, Pinillos, & Holyoak, 2015; for evidence of cross-cultural variation in intuition in other areas of philosophy, see Abarbanell & Hauser, 2010; Haidt, Koller, & Dias, 1993; Machery, Mallon, Nichols, & Stich, 2004; Machery, Olivola, & De Blanc, 2009; Machery et al., 2010).

In addition to these partially conflicting results, there are a number of limitations in these studies. In both the Weinberg et al. (2001) and the Turri (2013) studies, the sample sizes were small (N = 23 for both East Asian and South Asian participants in Weinberg et al., and N = 27 in Turri). Moreover, in contrast to American participants (Buhrmester, Kwang, & Gosling, 2011), it remains unclear whether answers obtained from Indian participants on Amazon Mechanical Turk are representative. The sample sizes for some of the ethnic groups in Nagel et al. (2013a) were also quite small (24 East Asians, 15 Latin Americans, and 14 Blacks), and the power of their test is not reported. An important limitation of another sort is that in all the studies we have cited, the vignettes and the questions were presented in English, and except for Turri (2013), all participants were resident in the United States, Canada or Britain.[2]

Because of these limitations and conflicting results, we think that at this point it is fair to conclude that we know very little about the extent to which epistemic intuitions and epistemic concepts vary across demographic groups. The goal of the study reported here is to address one of the most basic questions about this issue: Do different cultural and linguistic groups *have* Gettier intuitions? More specifically, we set out to investigate whether, in quite different cultural groups that speak quite different languages, there are cases of JTB that are not judged to be cases of knowledge.

The literature we have cited tends to support the view that English speakers in a variety of demographic groups do exhibit Gettier intuitions, since in every study except Weinberg et al. there were *some* Gettier cases that were judged not to be knowledge by a majority of participants in every demographic group reported. And even in the Weinberg et al. study, 43% of East Asian participants and 39% of South Asian participants reported that the protagonist in the Gettier case did not have knowledge. At this point, however, little is known about how the concept(s) of knowledge underlying standard translations of "S knows that p" in other languages deal with Gettier cases.[3] Does Gettier's seminal discovery apply to them, or are knowledge concepts in other languages captured by the traditional JTB account?

To address this question, we designed a study using two distinct Gettier cases, along with a clear knowledge case and a false belief case (all based on vignettes used in Nagel et al., 2013a). We surveyed participants in 4 different countries— USA, Brazil, India, and Japan—in their native languages: English, Portuguese, Bengali, and Japanese.

2. A Cross-Cultural Study of the Gettier Intuition

In this section, we describe the most important characteristics of our study and report our results. Technical details, including statistical analyses, are presented in Appendix 1.

We collected data from 521 participants in 4 countries: USA, India, Japan, and Brazil. Since we are interested in the prevalence of Gettier intuitions across cultures and languages, we excluded the answers of those participants who judged that the protagonist's belief was not justified in any of the 4 vignettes (answer ≤ 4 to the justification questions).[4] Our final sample consisted of 245 respondents.[5]

Four vignettes were presented consecutively in a fixed order: the Gettier/hospital case, the clear knowledge case, the Gettier/trip case, and the false belief case. The first and the third vignettes are Gettier cases; the second and fourth are control cases. The two Gettier cases read as follows:

Gettier/Hospital Case

Paul Jones was worried because it was 10 pm and his wife Mary was not home from work yet. Usually she is home by 6 pm. He tried her cell phone but just kept getting her voicemail. Starting to worry that something might have happened to her, he decided to call some local hospitals to ask whether any patient by the name of "Mary Jones" had been admitted that evening. At the University Hospital, the person who answered his call confirmed that someone by that name had been admitted with major but not life-threatening injuries following a car crash. Paul grabbed his coat and rushed out to drive to University hospital. As it turned out, the patient at University Hospital was not Paul's wife, but another woman with the same name. In fact, Paul's wife had a heart attack as she was leaving work, and was at that moment receiving treatment in Metropolitan Hospital, a few miles away.

Gettier/Trip Case

Luke works in an office in New York with two other people, Victor and Monica. All winter Victor has been describing his plans to go to Las Vegas on his vacation, even showing Luke the website of the hotel where he has reservations. When Victor is away on vacation, Luke receives a very nice email from Victor together with photos of Victor posing in front of Las Vegas landmarks. When he gets back to work, Victor talks a lot to Luke about how much fun he had vacationing in Las Vegas. However, Victor didn't really go on the trip; he has just been pretending. His tickets and reservations were cancelled because his credit card was maxed out, and he secretly stayed home in New York, very skillfully faking the photos he sent Luke. Meanwhile, Monica just spent a weekend vacationing in Las Vegas, but kept this a secret from all her co-workers.

The two control cases read as follows:

Clear Knowledge Case

Albert is in a furniture store with his wife. He is looking at a bright red table in a display. He believes the table is just the shade of red he was looking for. The showroom features contemporary furniture pieces, with clear, natural lighting throughout the entire store, and plenty of space around each piece on display. Albert usually likes traditional furniture designs, however the modern design of this particular table appeals to him for some reason. He checks the dimensions and price of the table, and starts to consider buying it. Albert asks his wife, "Do you like this red table?"

False Belief Case

Emma is shopping for jewelry. She goes into a nice-looking store. She looks at several displays, then selects a necklace from a tray marked "Diamond Earrings and Pendants." "What a lovely diamond!" she says as she tries it on. Zirconium is a substance from which fake diamonds can be made. Emma could not tell the difference between a real diamond and a zirconium fake just by looking or touching. In fact, this particular store has a dishonest employee who has been stealing real diamonds and replacing them with fakes; in the tray Emma chose from, all of the necklaces—including the one she tried on—had zirconium stones rather than diamonds.

The clear knowledge case is a clear case of knowledge: The protagonist has a justified true belief about the proposition (as in a Gettier case), and philosophers typically judge that she knows this proposition.[6] The false belief case is a clear case of false justified belief: The protagonist is justified in believing a proposition (as in a Gettier case), but her belief is false.

Each scenario was followed by 4 questions:

(1) a binary comprehension question;
(2) a binary question asking whether or not the protagonist knows the relevant proposition; the response options were "Yes, [s]he knows" and "No, [s]he doesn't know" (We call this question *Knowledge 1*);
(3) a question about justification ("How justified is [name of the protagonist] in thinking that [relevant proposition]") followed by a 7-point scale ranging from "completely unjustified" to "completely justified";
(4) the question: "In your view, which of the following sentences better describes [the protagonist's] situation?" followed by two choices, (i) "[Protagonist] knows that [relevant proposition]," and (ii) "[Protagonist] feels like [s]he knows that [relevant proposition] but [s]he doesn't actually know [this]." (We call this question *Knowledge 2.*)

To illustrate, the comprehension question of the false belief case was (possible answers in parentheses): "According to the story, what kind of stone is in the necklace that Emma tries on?" ("Diamond"/"Zirconium"); the knowledge 1 probe was: "Does Emma know whether or not the stone is a diamond?" ("Yes, she knows"/"No, she doesn't know"); The justification probe was: "How justified is Emma in thinking that the stone is a diamond?" (7-point scale); finally, the knowledge 2 probe read as follows: "In your view, which of the following sentences
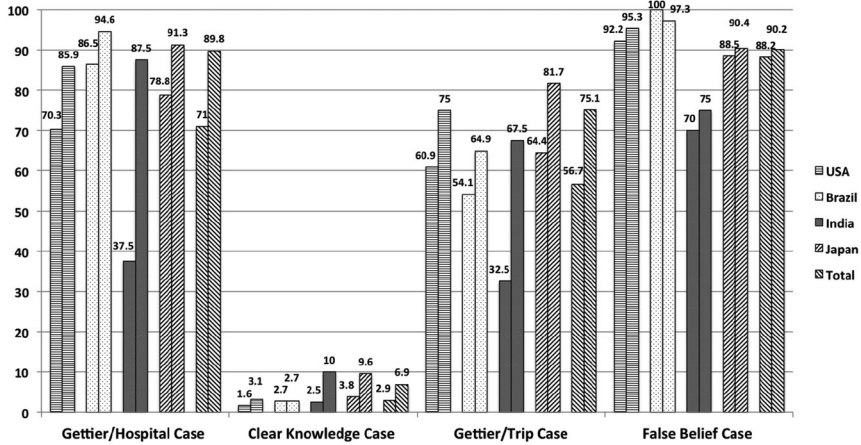
Figure 1. Proportion of knowledge denial for the four cases and the four populations (first column for each country: Knowledge 1; second column: Knowledge 2)

better describes Emma's situation?" ("Emma knows that the stone is a diamond"/ "Emma feels like she knows that the stone is a diamond, but she doesn't actually know that it is.")

The knowledge 2 probe is loosely inspired by the procedure used in Nagel et al. (2013a), where participants were first asked a knowledge question with the response options "yes, she knows," "no, she doesn't know," and "unclear," and then, if they had answered "yes, she knows," they were presented with what we are calling the Knowledge 2 question. Nagel et al. (2013a) motivate the use of the Knowledge 2 question by noting that "know" can be used to express the judgment that a protagonist feels like she knows some proposition—a phenomenon known as "protagonist projection" (Holton, 1997; Buckwalter, 2014)—and the Knowledge 2 question gives us some insight into whether this is what a participant is doing when she responds to the Knowledge 1 question. However, as Starmans and Friedman (2013, 664) argue, asking the Knowledge 2 question only when participants indicate that the protagonist does have knowledge is methodologically problematic. Thus, in contrast to Nagel et al. (2013a), participants in our study were *always* asked the Knowledge 2 question.

The final page of our questionnaire asked participants to report various demographic characteristics.

The proportion of knowledge denial for each condition is reported in Figure 1 (see Appendix 1 for statistical details).

We found a few differences in participants' responses to the two Gettier cases, due either to the presentation order, to their particular content, or to other differences (e.g., difference in complexity or length). In the USA, we found no difference in knowledge ascription between the two Gettier cases. In contrast, Brazilians and Indians were significantly more likely to ascribe knowledge in the Gettier/trip case than in the Gettier/hospital case in response to both knowledge probes. Indians

were significantly more likely to assign knowledge in the Gettier/trip case than in the Gettier/hospital case in response to the knowledge 2 probe. Importantly, the differences in response to the two Gettier cases were small, and by and large participants responded similarly to them.

In the four countries, participants were much less likely to ascribe knowledge in either Gettier case than in the clear knowledge case on either the knowledge 1 or knowledge 2 probe. In particular, Americans, Brazilians, Indians, and Japanese were much more likely to agree with the statement "The protagonist feels like she knows that *p*, but she doesn't actually know that *p*" in the Gettier cases than in the clear knowledge case, and the proportion of participants agreeing with this statement was large to very large (64.9% to 94.6%).

Participants were often, though not always, somewhat more likely to ascribe knowledge in the Gettier cases than in the control false belief case. Americans and Brazilians were significantly more likely to ascribe knowledge in the Gettier cases than in the false belief case except for knowledge ascription in response to the second knowledge probe in the Gettier/hospital case. Indians were significantly more likely to ascribe knowledge in the Gettier cases than in the control false belief case in response to the first knowledge probe, but not to the second knowledge probe. Japanese's knowledge ascription was not significantly different in the Gettier cases and in the false belief case, except for the knowledge 1 probe of the Gettier/trip case. Importantly, the difference between the proportion of knowledge denial in the Gettier cases and in the false belief case was typically small (from 2.7% to 32.4% as measured by answers to Knowledge 2).

Finally, in response to the knowledge 1 probe, Indian participants (who spoke Bengali) were more likely to ascribe knowledge in either Gettier case than Americans, Brazilians, and Japanese (who did not differ from each other). That is, Indian participants were more likely than Americans, Brazilians, and Japanese to say that the protagonist knows that *p* when given the choice between "know" and "does not know." Most important, however, there was no difference in knowledge ascription between the USA, Brazil, India, and Japan in either Gettier case in response to the knowledge 2 probe. That is, Indians, Americans, Brazilians, and Japanese tend to share the Gettier intuition about Gettier cases.

3. Epistemology Across Cultures

In the previous section, we have provided some novel evidence that across quite different cultures and languages people exhibit Gettier intuitions. In this section, we look more closely at these results and examine their implications for folk epistemology.

3.1 Core Folk Epistemology

Gettier cases are cases in which a protagonist has JTB but, according to many philosophers, does not have knowledge, and Gettier intuitions are judgments indicating that the protagonists in such cases do not have knowledge. The question our study was designed to address is whether Gettier intuitions can be found in different

cultural and linguistic groups, and our data provide clear evidence that the answer is *yes*. In response to both the Knowledge 1 and the Knowledge 2 questions, a substantial majority of our Brazilian, Japanese and American participants judged that the protagonist did not know the relevant proposition in both of the Gettier cases we presented to them. With our Bengali speaking Indian participants, the situation is a bit more complicated. Their responses to the Knowledge 2 questions in the Gettier cases were not significantly different from the responses of the Brazilian, Japanese and American participants. In response to the Knowledge 1 question, between 32.5% and 37.5% of the Bengali speakers denied knowledge, while less than 2.5% denied knowledge in the clear knowledge case. Taken together, these findings strongly suggest that for many Bengali speaking participants, their concept of knowledge requires more than JTB. Though a substantial number of Bengali speakers (between 62.5% and 66.5%) said that the protagonists in the Gettier cases did have knowledge in response to the Knowledge 1 question, we suspect that this can be explained by facts about the word commonly used to translate "know" in Bengali. The words commonly used to translate "to know" in Bengali ("jáná") and in Sanskrit "jñá" (the verbal root of the Bengali word) are used somewhat differently from "to know" in English. In particular, the distinction between "to believe" and "to know" is not always retained when "jáná" or "jñá" are used, which plausibly explains why in Gettier cases a majority of Bengali participants readily "ascribed knowledge" to the protagonist when simply asked whether the protagonist knows ("jáná") the relevant proposition. At the same time, "jáná" can be used to single out an epistemic state that differs from true justified belief, as shown by participants answer to the Knowledge 2 question. Thus, "jáná" may in fact express two rather different concepts in Bengali, one of which is closer to the concept expressed in English by "knows" and the other closer to the concept expressed in English by "believes." While the distinction is apparently not highly salient for Bengali speakers, the different responses to the Knowledge 1 and Knowledge 2 questions suggest that there is a (largely unconscious) awareness of the distinction.

Though we have only looked at four cultures and four languages, they include both cultures and languages that are quite different from each other. Since participants in all four cultures exhibit Gettier intuitions, we think it is plausible to hypothesize that Gettier intuitions may be a reflection of an underlying innate and universal *core folk epistemology*. If this hypothesis is correct, then people in all cultures will possess epistemic concepts that require more than justification, truth and belief, and in most cultures that concept will be expressed by the epistemic term commonly translated into English as "know."[7] Other plausible components of core folk epistemology are evidential markers (Ozturk & Papafragou, 2007, 2008; Papafragou, Li, Choi, & Han, 2007) and epistemic modals (Noveck, Ho, & Sera, 1996; Papafragou & Ozturk, 2007).[8]

It is important to recognize that even if Gettier intuitions are a reflection of a core folk epistemology, and people in all cultures have a central epistemic concept that requires more than JTB, this does *not* entail that people in all cultures have the same knowledge concept. For it might be the case that, while core folk

epistemology requires a knowledge concept that is more demanding than JTB, it permits considerable variation in the details, with different cultures elaborating on the JTB theme in different ways. If that's correct, we would expect to find that while all cultures exhibit Gettier intuitions, different cultures judge different Gettier cases not to be knowledge. It might also be the case that there is variation within a culture, with different sub-groups having different knowledge concepts and different intuitions about which Gettier cases are and are not instances of knowledge. Indeed, this pattern is suggested by the Starmans and Friedman (2012) finding that many English speaking non-philosophers attribute knowledge in a number of Gettier cases that philosophers typically judge not to be cases of knowledge. In more recent work, Starmans and Friedman have also found striking differences in Gettier intuitions between philosophers and academics in other disciplines (Starmans & Friedman, 2014). Recent work by Waterman, Gonnerman, and Alexander (ms) suggests another way in which folk epistemology may vary as a function of demographic variables. They report that that Indian participants (recruited through Amazon Mechanical Turk) are less likely than Chinese and American participants to ascribe knowledge to a protagonist when one makes salient a merely possible situation that would render the protagonist's belief false.

3.2 Limitations and Further Studies

Since we only examined 4 cultures and languages, it is important to extend these results to other cultures and languages. We plan to do this and to expand the studies to include demographic variables other than native language and culture. Among the variables we will include in the new studies are religion, SES, and age. In the current study, a large majority of participants were undergraduate students. To get a better picture of the scope and limits of core folk epistemology, it will be important to replicate this study with people who have not received an extensive formal education.

There are two other ways in which the present research should be extended. First, if there is a core folk epistemology, we should study its development. There is already a substantial body of developmental evidence about evidentials (Ozturk & Papafragou, 2007, 2008; Papafragou, Li, Choi, & Han, 2007), but the developmental literature about knowledge remains limited (but see Abbeduto & Rosenberg, 1985; Booth, Hall, Robison, & Kim, 1997; Chandler, Fritz & Hala, 1989; Fabricius & Khalil, 2003; Hogrefe, Wimmer & Perner, 1986; Lewis, Hacquard, & Lidz, 2012; Shatz, Wellman, & Silber, 1983; Sullivan & Winner, 1993; Wellman & Liu, 2004). Second, we should extend this cross-cultural research beyond Gettier cases to study other possible components of the core folk epistemology—including whether people in a variety of cultures tend to think that reliability is a necessary condition for the justification of beliefs, whether or not stakes affect knowledge ascription, and a wide range of other issues that have been broached by contemporary epistemologists, who are overwhelmingly WEIRD[9] and English speaking.

4. Philosophical Implications

As we noted in Section 1, over the last fifteen years, philosophers have been engaged in a sustained debate about whether the Gettier intuition and, more generally, the concept of knowledge are widely shared across cultures and languages (e.g., Sosa, 2007, 2009; Spicer, 2010; Nagel, 2012; Stich, 2013; Hannon, 2015). Some philosophers have been unmoved by the cross-cultural studies reporting cultural variation in response to epistemological cases (Weinberg et al., 2001), maintaining that the Gettier intuition is likely to be widespread and that the concept of knowledge is likely to be shared across cultures. Sosa argued that the diversity of responses reported by Weinberg and colleagues could simply be due to participants understanding the cases (e.g., the Gettier case) differently across cultures (2009, 107):

> It is not clear exactly what question the subjects disagree about. In each case, the question would be of the form: "Would anyone who satisfied condition C with regard to proposition <p> know that p or only believe it?" It is hearing or reading a description of the example that enables the subjects to fill in the relevant C and <p>. But can we be sure that they end up with exactly the same C and <p>?

> Here is a reason for doubt. When we read fiction we import a great deal that is not explicit in the text. We import a lot that is normally presupposed about the physical and social structure of the situation as we follow the author's lead in our own imaginative construction. And the same seems plausibly true about the hypothetical cases presented to our WNS [Weinberg, Nichols, and Stich] subjects. Given that these subjects are sufficiently different culturally and socio-economically, they may because of this import different assumptions as they follow in their own imaginative construction the lead of the author of the examples, and this may result in their filling the crucial C differently. (. . .) But if C varies across the divide, then the subjects may not after all disagree about the very same content.

Similarly, granting that Weinberg and colleagues' cross-cultural work on knowledge ascription shows that responses to Gettier cases vary across cultures, Spicer argues that this variation is compatible with the universality of folk epistemology (2010, 525):

> [T]here are a number of possible explanations of the cross-cultural differences in epistemic intuitions—one positing analogous variation in FE [folk epistemology]; others consistent with folk epistemology's being universal. Summarizing, the Nicols [sic] et al. result might be due to:

> - cross-cultural differences between attention, reading-with-care, etc.
> - cross-cultural differences in which aspects of the story are salient
> - cross-cultural differences in tacit theory
> - cross-cultural differences in non-epistemic judgement about the case described [. . .]
> - cross-cultural differences in choice of which principles of the tacit theory to deploy.

Others have alluded to evidence supporting the universality of the concept of knowledge. In particular, summarizing the research associated with Wierzbicka and Goddard, Hannon claims (2015, 770):

According to the program of semantic research known as Natural Semantic Metalanguage, there exists a small inventory of universal concepts that are expressed by some word in every human language (Goddard and Wierzbicka, 2002). Evidence from cross-cultural semantics suggests that the concept expressed by the word "know" is universal in this sense (Goddard, 2010).

The universality of the Gettier intuition and of the concept of knowledge bears on several philosophical issues, two of which are discussed here. First and foremost, it bears on the role of intuition in philosophy.[10] If intuitions vary across cultures, their legitimate use in philosophy seems in jeopardy. This challenge has been put in different terms. Machery (2011) argues that this variation is defeasible evidence that philosophical intuitions are unreliable. In contrast, Weinberg (2007) and Alexander and Weinberg (2014) argue that this variation only shows that philosophical intuitions are fallible, but they also hold that we should not rely on them because we do not know when they fail (they are thus "hopeless" in Weinberg, 2007's terminology). Together with the intuition elicited by the Gödel case (Machery et al., 2004), the Gettier intuition has been a central piece of evidence for the cross-cultural challenge to the role of intuitions in philosophy. The universality of the Gettier intuition and of the concept of knowledge bears on a second philosophical issue. In an influential book, Craig (1990) argued, roughly, that the teleological function of the concept of knowledge is to identify reliable sources of information. If Craig is right, people should share the concept of knowledge across cultures.

The research presented in this article moves these two debates forward, although much work remains to be done to settle them conclusively. We have provided evidence that the Gettier intuition is universal, removing one of the crucial bits of evidence for the cross-cultural challenge to the role of intuitions in philosophy. That said, at this point we should refrain from dismissing this challenge too quickly. Further evidence could show that the Gettier intuition does vary across cultures. Other epistemic intuitions may vary across cultures. For instance, we know almost nothing about whether the sensitivity of knowledge ascription to stakes varies across cultures. Finally, a robust body of evidence shows that the intuition elicited by the Gödel case varies across cultures (Machery et al., 2004; Machery et al., 2009; Machery et al., 2010; Beebe & Undercoffer, 2015; Machery, Sytsma, & Deutsch, 2015; Sytsma, Livengood, Sato, & Oguchi, 2015).

Second, we have provided evidence that people across cultures share a core folk epistemology, just as they share a folk physics or a folk biology (for review, see Carey, 2009). Furthermore, we have identified a possible component of this core folk epistemology: It is plausible that across languages the word that is used to translate "to know" refers to a property speakers distinguish form the possession of a mere justified true belief. These findings are broadly consistent with Craig's proposal, although we should again refrain from drawing any premature conclusion since much remains unknown about folk epistemology. In particular, as we explained in the previous section, our findings do not support the claim that the words used to translate "to know" express the same concept: Speakers of different languages may refer to different properties, all of which differ from the possession of mere justified belief.

5. Conclusion

In this article, we have provided evidence that across quite different cultures and languages people exhibit Gettier intuitions, and thus that the concepts they express by the words that translate "to know" require more than justification, truth, and belief. This may reflect one of the components of a species-typical core folk epistemology.

Appendix 1

Participants
American participants were recruited on Amazon Mechanical Turk (www.mturk.com) and received some compensation. All the other participants completed paper-and-pencil versions of the survey, and they were volunteers. We excluded data from participants who failed to complete the questionnaire, were less than 18 years old, did not answer correctly any of the 4 comprehension questions, indicated that they were not citizens of the country in which they were recruited, or were born in a country other than the one in which they were recruited. Table 1 presents basic descriptive statistics for participants in each country.

Procedure
The questionnaire was translated from English into the appropriate language for each country. In India, data was collected in Kolkata where the dominant language is Bengali. The translators were bilingual scholars who were native speakers of Portuguese, Bengali and Japanese, respectively. Participants from Brazil, Japan, and India were administered paper-and-pencil versions of the questionnaire, while American participants completed a web-based version of the same questionnaire. The first two pages of the questionnaire briefly introduced participants to the study, instructed them to read the instructions and questions carefully and to refrain from talking to anyone else during the study; it was explained that their responses would remain anonymous.

Results
We first analyze participants' answers across cultures. For the two Gettier cases, we found a significant difference for Knowledge 1 (Gettier/hospital case: $\chi^2(3, 245) = 29.25$, $p < .001$; Gettier/trip case: $\chi^2(3, 245) = 12.64$, $p = .005$), but not for Knowledge 2 (Gettier/hospital case: $\chi^2(3, 245) = 2.47$, $p = .48$; Gettier/trip case: $\chi^2(3, 245) = 4.75$, $p = .12$). Indian participants were significantly less likely to deny knowledge for Knowledge 1 than the 3 other samples for the 2 Gettier cases (Gettier/hospital case: American participants, $\chi^2(1, 104) = 10.86$, $p = .001$, Brazilian participants, $\chi^2(1, 77) = 19.40$, $p < .001$, Japanese participants, $\chi^2(1, 144) = 22.46$, $p<.001$; Gettier/trip case: American participants, $\chi^2(1, 104) = 7.96$, $p = .005$, Japanese participants, $\chi^2(1, 144) = 11.92$, $p = .001$), except when their answers were compared to Brazilian participants' answers to the Gettier/trip case ($\chi^2(1, 77) = 3.65$, $p = .06$). In contrast, Indian participants did not differ from any

Table 1.

Country	Method	Location / Source	N	% Male	Age			
					Range	M	SD	Median
Brazil	Paper-pencil	Law School of the Federal University of Rio de Janeiro	37	18.9	20–37	22.1	2.8	22.0
Japan	Paper-pencil	The University of Tokyo, Fukuyama University, Toyo University, Kyushu University, and public places	104	60.6	20–78	28.3	13.7	22
India	Paper-pencil	Jadavpur University, Vidyasagar University, University of Kalyani	40	42.5	18–56	26.8	9.3	22.5
USA	Web-based	Amazon Mechanical Turk	64	40.6	na–na	na	na	na

of the 3 other populations for Knowledge 2 of either Gettier case (Gettier/hospital case: American participants, $\chi^2(1, 104) = .05$, $p = .82$, Brazilian participants, $\chi^2(1, 77) = 1.17$, $p = .30$, Japanese participants, $\chi^2(1, 144) = .49$, $p = .49$; Gettier/trip case: American participants, $\chi^2(1, 104) = .69$, $p = .41$, Brazilian participants, $\chi^2(1, 77) = .06$, $p = .81$, Japanese participants, $\chi^2(1, 144) = 3.39$, $p = .07$). American, Brazilian, and Japanese participants did not differ from one another for either the Gettier/trip case ($\chi^2(2, 205) = 4.46$, $p = .11$) or the Gettier/hospital case ($\chi^2(2, 205) = 3.72$, $p = .16$).

We now turn to the analysis of our data country by country. In the USA, we found no difference between the 2 Gettier cases (Knowledge 1: $\chi^2(1, 128) = 1.33$, $p = .26$; Knowledge 2: $\chi^2(1, 128) = 2.44$, $p = .12$). As expected, we found a significant difference between the 4 cases for Knowledge 1 ($\chi^2(3, 256) = 117.08$, $p<.001$) and Knowledge 2 ($\chi^2(3, 256) = 148.40$, $p<.001$). Planned tests found that American participants were significantly less likely to ascribe knowledge in either Gettier case than in the clear knowledge case (Gettier/hospital case: Knowledge 1, $\chi^2(1, 128) = 65.70$, $p<.001$ and Knowledge 2, $\chi^2(1, 128) = 88.84$, $p<.001$; Gettier/trip case: Knowledge 1, $\chi^2(1, 128) = 52.51$, $p<.001$ and Knowledge 2, $\chi^2(1, 160) = 69.45$, $p<.001$), although they were also significantly more likely to ascribe knowledge in either Gettier case than in the false belief case (Gettier/hospital case: Knowledge 1, $\chi^2(1, 128) = 10.05$, $p<.005$; Gettier/trip case: Knowledge 1, $\chi^2(1, 128) = 17.42$, $p<.001$ and Knowledge 2, $\chi^2(1, 128) = 10.45$, $p = .001$), except for Knowledge 2 of the Gettier/hospital case ($\chi^2(1, 128) = 3.31$, $p = .07$).

In Brazil, we found a significant difference between the 2 Gettier cases (Knowledge 1: $\chi^2(1, 74) = 9.32$, $p = .002$; Knowledge 2: $\chi^2(1, 74) = 10.12$, $p = .001$). As expected, we found a significant difference between the 4 cases for Knowledge 1 ($\chi^2(3, 148) = 87.21$, $p<.001$) and Knowledge 2 ($\chi^2(3, 148) = 94.16$, $p<.001$). Planned tests found that Brazilian participants were significantly less likely to ascribe knowledge in either Gettier case than in the clear knowledge case (Gettier/hospital case: Knowledge 1, $\chi^2(1, 74) = 52.56$, $p<.001$ and Knowledge 2, $\chi^2(1, 74) = 62.53$, $p<.001$; Gettier/trip case: Knowledge 1, $\chi^2(1, 74) = 24.00$, $p<.001$ and Knowledge 2, $\chi^2(1, 74) = 31.96$, $p<.001$). Brazilian participants were significantly more likely to ascribe knowledge for Knowledge 1 of the Gettier/hospital case than in the false belief case ($\chi^2(1, 74) = 5.36$, $p<.05$), but not for Knowledge 2 ($\chi^2(1, 74) = .35$, $p>.5$); they were significantly more likely to ascribe knowledge in the Gettier/trip case than in the false belief case (Knowledge 1: $\chi^2(1, 74) = 22.07$, $p<.001$; Knowledge 2, $\chi^2(1, 160) = 12.7$, $p<.001$).

In India, we found a significant difference between the 2 Gettier cases for Knowledge 2 ($\chi^2(1, 80) = 4.56$, $p<.05$), but not for Knowledge 1 ($\chi^2(1, 80) = .22$, $p = .64$). As expected, we found a significant difference between the 4 cases for Knowledge 1 ($\chi^2(3, 160) = 39.98$, $p<.001$) and Knowledge 2 ($\chi^2(3, 160) = 58.96$, $p<.001$). Planned tests found that Indian participants were significantly less likely to ascribe knowledge in either Gettier case than in the clear knowledge case (Gettier/hospital case: Knowledge 1, $\chi^2(1, 80) = 15.31$, $p<.001$ and Knowledge 2, $\chi^2(1, 80) = 48.08$, $p<.001$; Gettier/trip case: Knowledge 1, $\chi^2(1, 80) = 12.47$, $p<.001$ and Knowledge

2, $\chi^2(1, 80) = 27.86$, $p<.001$), although they were also significantly more likely to ascribe knowledge in either Gettier case than in the false belief case for Knowledge 1 (Gettier/hospital case: $\chi^2(1, 80) = 8.50$, $p<.005$; Gettier/trip case: $\chi^2(1, 80) = 11.26$, $p = .001$), but not for Knowledge 2 (Gettier/hospital case: $\chi^2(1, 80) = 2.05$, $p = .15$; Gettier/trip case: $\chi^2(1, 80) = .60$, $p = .46$).

In Japan, we found a significant difference between the 2 Gettier cases (Knowledge 1: $\chi^2(1, 208) = 5.32$, $p<.05$); Knowledge 2: $\chi^2(1, 208) = 4.13$ $p<.05$). As expected, we found a significant difference between the 4 cases for Knowledge 1 ($\chi^2(3, 416) = 186.15$, $p<.001$) and Knowledge 2 ($\chi^2(3, 416) = 222.91$, $p<.001$). Planned tests found that Japanese participants were significantly less likely to ascribe knowledge in either Gettier case than in the clear knowledge case (Gettier/hospital case: Knowledge 1, $\chi^2(1, 208) = 120.61$, $p<.001$ and Knowledge 2, $\chi^2(1, 208) = 138.96$, $p<.001$; Gettier/trip case: Knowledge 1, $\chi^2(1, 208) = 85.46$, $p<.001$ and Knowledge 2, $\chi^2(1, 208) = 108.99$, $p<.001$). They were not significantly more likely to ascribe knowledge in either Gettier case than in the false belief case (Gettier/hospital case: Knowledge 1, $\chi^2(1, 208) = 3.52$, $p = .06$; Knowledge 2, $\chi^2(1, 208) = .06$, $p = .8$); Gettier/trip case: Knowledge 2, $\chi^2(1, 208) = 3.25$, $p = .07$), except for Knowledge 1 of the Gettier/trip case ($\chi^2(1, 208) = 16.69$, $p<.001$).

Appendix 2

Appendix 2 reports the data analysis with all the participants who passed the comprehension checks, whether or not they judged the cases to be justified (Figure 2).

We first analyze participants' answers across cultures. For the two Gettier cases, we found a significant difference for Knowledge 1 (Gettier/hospital case: $\chi^2(3, 409) = 42.52$, $p<.001$; Gettier/trip case: $\chi^2(3, 409) = 17.45$, $p = .001$), but not for Knowledge 2 (Gettier/hospital case: $\chi^2(3, 409) = 4.03$, $p<.001$; Gettier/trip case: $\chi^2(3, 409) = 7.36$, $p = .06$). Indian participants were significantly less likely to deny knowledge for Knowledge 1 than the 3 other samples for the 2 Gettier cases (Gettier/hospital case: American participants, $\chi^2(1, 158) = 14.67$, $p<.001$, Brazilian participants, $\chi^2(1, 126) = 29.08$, $p<.001$, Japanese participants, $\chi^2(1, 281) = 29.55$, $p<.001$; Gettier/trip case: American participants, $\chi^2(1, 158) = 10.11$, $p = .001$, Japanese participants, $\chi^2(1, 281) = 15.81$, $p<.001$), except when their answers were compared to Brazilian participants' answers to the Gettier/trip case ($\chi^2(1, 126) = 2.77$, $p = .10$). American, Brazilian, and Japanese participants did not differ from one another for either the Gettier/trip case ($\chi^2(2, 331) = 2.02$, $p = .33$) or the Gettier/hospital case ($\chi^2(2, 331) = 5.93$, $p = .0.52$), although the latter p-value was close to the significance threshold.

We now turn to the analysis of our data country by country. In the USA, we found no difference between the 2 Gettier cases (Knowledge 1: $\chi^2(1, 160) = .47$, $p = .50$; Knowledge 2: $\chi^2(1, 160) = 1.05$, $p = .31$). As expected, we found a significant difference between the 4 cases for Knowledge 1 ($\chi^2(3, 320) = 147.31$, $p<.001$) and Knowledge 2 ($\chi^2(3, 320) = 173.24$, $p<.001$). Planned tests found that American participants were significantly less likely to ascribe knowledge in either
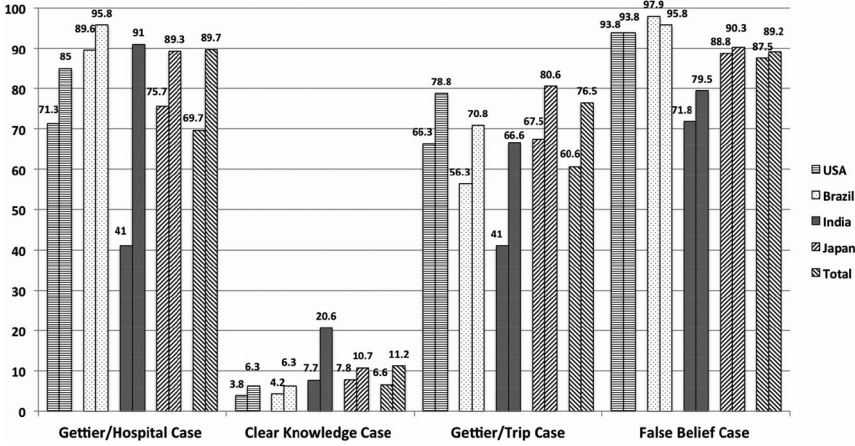
Figure 2. Proportion of knowledge denial for the four cases and the four populations (first column for each country: Knowledge 1; second column: Knowledge 2)

Gettier case than in the clear knowledge case (Gettier/hospital case: Knowledge 1, $\chi^2(1, 160) = 77.76$, $p<.001$ and Knowledge 2, $\chi^2(1, 160) = 99.99$, $p<.001$; Gettier/trip case: Knowledge 1, $\chi^2(1, 160) = 68.68$, $p<.001$ and Knowledge 2, $\chi^2(1, 160) = 86.04$, $p<.001$), although they were also significantly more likely to ascribe knowledge in either Gettier case than in the false belief case (Gettier/hospital case: Knowledge 1, $\chi^2(1, 160) = 14.01$, $p<.001$; Gettier/trip case: Knowledge 1, $\chi^2(1, 160) = 18.91$, $p<.001$ and Knowledge 2, $\chi^2(1, 160) = 7.60$, $p<.01$), except for Knowledge 2 of the Gettier/hospital case ($\chi^2(1, 160) = 3.23$, $p = .07$).

In Brazil, we found a significant difference between the 2 Gettier cases (Knowledge 1: $\chi^2(1, 96) = 13.50$, $p<.001$; Knowledge 2: $\chi^2(1, 96) = 10.80$, $p = .001$). As expected, we found a significant difference between the 4 cases for Knowledge 1 ($\chi^2(3, 192) = 110.58$, $p<.001$) and Knowledge 2 ($\chi^2(3, 192) = 121.50$, $p<.001$). Planned tests found that Brazilian participants were significantly less likely to ascribe knowledge in either Gettier case than in the clear knowledge case (Gettier/hospital case: Knowledge 1, $\chi^2(1, 96) = 70.32$, $p<.001$ and Knowledge 2, $\chi^2(1, 96) = 80.67$, $p<.001$; Gettier/trip case: Knowledge 1, $\chi^2(1, 96) = 30.88$, $p<.001$ and Knowledge 2, $\chi^2(1, 96) = 45.51$, $p<.001$). Brazilian participants were significantly more likely to ascribe knowledge in the Gettier/trip case than in the false belief case (Knowledge 1: $\chi^2(1, 96) = 23.58$, $p<.001$; Knowledge 2, $\chi(1, 160) = 10.8$, $p = .001$), but not in the Gettier/hospital case (Knowledge 1: $\chi^2(1, 96) = 2.84$, $p = .09$; Knowledge 2, $\chi^2(1, 96) = .00$, $p = 1$).

In India, we found a significant difference between the 2 Gettier cases for Knowledge 2 ($\chi^2(1, 156) = 13.87$, $p<.001$), but not for Knowledge 1 ($\chi^2(1, 156) = .000$, $p = 1$). As expected, we found a significant difference between the 4 cases for Knowledge 1 ($\chi^2(3, 312) = 66.62$, $p<.001$) and Knowledge 2 ($\chi^2(3, 312) = 97.60$, $p<.001$). Planned tests found that Indian participants were significantly less likely to ascribe knowledge in either Gettier case than in the clear knowledge case

(Gettier/hospital case: Knowledge 1, $\chi^2(1, 156) = 23.52$, $p<.001$ and Knowledge 2, $\chi^2(1, 156) = 78.61$, $p<.001$; Gettier/trip case: Knowledge 1, $\chi^2(1, 156) = 23.52$, $p<.001$ and Knowledge 2, $\chi^2(1, 156) = 33.79$, $p<.001$), although they were also significantly more likely to ascribe knowledge in either Gettier case than in the false belief case (Gettier/hospital case: Knowledge 1, $\chi^2(1, 156) = 15.02$, $p<.001$ and Knowledge 2, $\chi^2(1, 156) = 4.13$, $p<.05$; Gettier/trip case: Knowledge 1, $\chi^2(1, 156) = 15.02$, $p<.001$), except for Knowledge 2 of the Gettier/trip case ($\chi^2(1, 156) = 3.26$, $p = .07$).

In Japan, we found a significant difference between the 2 Gettier cases for Knowledge 2 ($\chi^2(1, 406) = 6.34$, $p<.05$), but not for Knowledge 1 ($\chi^2(1, 406) = 3.47$, $p = .06$). As expected, we found a significant difference between the 4 cases for Knowledge 1 ($\chi^2(3, 812) = 322.66$, $p<.001$) and Knowledge 2 ($\chi^2(3, 812) = 408.63$, $p<.001$). Planned tests found that Japanese participants were significantly less likely to ascribe knowledge in either Gettier case than in the clear knowledge case (Gettier/hospital case: Knowledge 1, $\chi^2(1, 406) = 190.25$, $p<.001$ and Knowledge 2, $\chi^2(1, 406) = 252.22$, $p<.001$; Gettier/trip case: Knowledge 1, $\chi^2(1, 406) = 151.43$, $p<.001$ and Knowledge 2, $\chi^2(1, 406) = 200.06$, $p<.001$), although they were also significantly more likely to ascribe knowledge in either Gettier case than in the false belief case (Gettier/hospital case: Knowledge 1, $\chi^2(1, 406) = 12.16$, $p<.001$; Gettier/trip case: Knowledge 1, $\chi^2(1, 406) = 27.64$, $p<.001$ and Knowledge 2, $\chi^2(1, 406) = 7.16$, $p<.01$), except for Knowledge 2 of the Gettier/hospital case ($\chi^2(1, 406) = .03$, $p = .87$).

Notes

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[2] Similar concerns apply to two other studies that failed to replicate Weinberg et al. (2001): Seyedsayamdost (2015) and Kim and Yuan (forthcoming).

[3] For ease of expression, we will adopt the convention of referring to the concepts invoked when people utter standard translations of "S knows that p" as *knowledge concepts*, though some philosophers would insist that if speaker does not share the intuition that Gettier cases are not cases of knowledge, then the concept she invokes when she says "S knows that p" is not the concept of knowledge (Jackson, 2011).

[4] The results reported below are qualitatively identical if these participants are not excluded. For details, see Appendix 2.

[5] 46.1% male; Age: Range = 18–78, $M = 26.7$, $SD = 11.6$, Median = 22. Age information was accidentally not collected for American participants.

[6] An informal poll among our colleagues confirms that philosophers take this to be a case of knowledge (N= 10; knowledge: 100%).

[7] Evidence suggests that the concept expressed by "to know" in English requires belief (Buckwalter, Rose, & Turri, 2013; Rose & Schaffer, 2013) and truth (Buckwalter, 2014).

[8] Of course, this is not the only hypothesis that might explain our findings. One alternative hypothesis is that there is some feature of the role that knowledge concepts play that favors the cultural evolution of knowledge concepts requiring more than JTB. It is not clear what this feature might be, though there are some suggestive comments in Craig (1990).

⁹ WEIRD is an acronym introduced by Henrich et al. (2010) for people from cultures that are Western, Educated, Industrialized, Rich and Democratic.

¹⁰ We bracket the question of whether and, if they do, in which sense philosophers actually appeal to intuitions in philosophical argumentation (Williamson, 2007; Cappelen, 2012).

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