# Cross-Cultural Universality of Knowledge Attribution

Since the first reports of significant cross-cultural differences in epistemic intuitions (Weinberg, Nichols & Stich, 2001), the field of epistemology has been haunted by the idea that epistemic intuitions are arbitrary.[1] Epistemologists generally assume that epistemic intuitions constitute evidence for or against their theories. If those intuitions are contingent on people's cultural background (among other arbitrary factors), epistemology based on Anglo-Americans' intuitions is like an anthropological report of Anglo-American table manners: parochial and non-normative.

In this paper, we provide substantive evidence that, *pace* advocates for epistemic cultural contingencies, epistemic intuitions are strikingly universal across cultures. Part I recounts the initial reports of cross-cultural differences as well as the theoretical and empirical responses that have followed. Part II presents the series of studies that we implemented in other cultures: Mainland China, South Korea, and Taiwan. We purposefully selected three recent and surprising experimental studies on knowledge attribution conducted with Anglo-American populations and replicated them with people from other cultures in their native tongues. We found that the same patterns emerged across cultures: for all three of our studies, the patterns of knowledge attribution among our Chinese and Korean participants were entirely consistent with the patterns originally found among English speakers. Part III posits *the universality hypothesis* on the basis of

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[1] Broadly speaking, epistemic intuitions include intuitions about knowledge attribution, epistemic justification and so forth. As the focus of this paper is on intuitive knowledge attribution, we employ the phrase "epistemic intuition" interchangably with a more precise phrase "intuitive knowledge attribution" for the sake of simplicity.

recent empirical studies including ours. It states that epistemic intuitions are to a great extent universal across cultures, which is compatible with the existence of minor cultural variations in people's epistemic intuitions. We further employ this hypothesis to argue for a new epistemological discourse: a shift away from the discourse of cross-cultural *differences* and toward a discourse of cross-cultural *universality*.

## 1. The Alleged Cross-Cultural Differences

Weinberg, Nichols and Stich (2001)—WNS in short—stirred a firestorm of debate over cross-cultural differences concerning people's epistemic intuitions. The authors selected a series of influential cases in epistemology (e.g., TrueTemp cases, Gettier cases, and the case of a cleverly disguised mule) and tested them among participants at Rutgers University who differed in terms of either cultural or socioeconomic background. In those tests, they asked the participants to judge whether the protagonist in those cases had knowledge or not. They reported statistically significant differences in knowledge attribution between contrasting demographic groups for a significant portion of those tests.

Though WNS examined cultural and socioeconomic divergences of people's epistemic intuitions, the former received more attention from the philosophical community. The most striking cross-cultural difference was reported about *Gettier cases*, the types of cases introduced in Gettier (1963). They reported that while the majority of Westerners refrained to attribute knowledge to the agent—the standard answer in the philosophical literature—the majority of East Asians did the opposite. Given the symbolic status of Gettier cases as a showcase of the evidential role of intuitions in

epistemology, such a cultural divergence was deeply concerning. WNS used the results to launch the following argument. Since intuitions are contingent on arbitrary factors such as ethnicity, they should not be trusted as evidence bearing on the nature of knowledge. Otherwise, epistemology is saturated with ethnocentrism.

Theorists raised numerous objections to WNS. Some disputed the validity of WNS's methodology. Kauppinen (2007) argued that intuitions gathered in surveys of lay people are not the same sort of reflective intuitions that philosophers are able to tap into as a result of their training and reflection. Sosa (2009) provided an alternative explanation for WNS's results claiming that Eastern Asians and Westerners may have different linguistic interpretations of the cases. Others challenged WNS's argument on theoretical grounds. Notably, Nagel (2012, 2013) appealed to a universal and arguably innate human capacity for "theory of mind"—roughly the capacity to comprehend other people's mental states—and argues that, because the concept of knowledge and the capacity for knowledge attribution is a basic element of people's theory of mind, we should expect epistemic intuitions to converge among various cultural groups. Similarly, Hannon (2015) posits that concepts evolve to serve particular communicative needs of a linguistic community. A concept as fundamental as "knowledge" serves some basic, crucial needs shared by all cultures. Thus, we should expect that different languages each feature a word largely equivalent to the English word, "knowledge." Still others rejected WNS's basic assumption. Cappelen (2014) argue that WNS "has been engaged in an attack on a strawman," because "philosophers don't rely on intuitions" in the first place (Cappelen 2014: 269).

As theoretical debates raged on, the empirical evidence against WNS also accrued.

Three independent replication studies (Nagel 2013, Kim & Yuan 2015; Seyedsayamdost 2015) failed to find the alleged demographic effects. Moreover, recent empirical findings offered initial positive support for cross-cultural universality. Machery et al. (2015, 2017) found that participants from a wide-range of countries, responding to cases in their native languages, shared the Gettier intuition. Rose et al. (2017) found that participants across the world did not take knowledge to be sensitive to practical stakes. The aforementioned studies taken together strongly suggest that epistemic intuitions are more universal than previously believed.

## 2. Studies

We aim to further test the hypothesis that epistemic intuitions are robustly universal across cultures. In designing our studies, we purposely selected recently discovered and sometimes surprising patterns of epistemic intuitions found among English speakers. If these quirky effects emerge across cultures, it constitutes substantive evidence for a robust level of cross-cultural universality in epistemic intuitions. Three effects that we selected include (1) the perceptual vs probabilistic evidence effect, namely that *ceteris paribus* people are less willing to ascribe knowledge to true beliefs based on probabilistic evidence than for true beliefs based on perceptual evidence (Friedman & Turri 2014); (2) the Gettierized epistemic side effect effect (GESEE), namely that *ceteris paribus* people are more willing to attribute knowledge to a protagonist when she engages in harmful activities than when she engages in beneficent activities even in Gettierized scenarios (Buckwalter 2014); and (3) the knowing without believing effect, namely that in certain cases, people are willing to attribute knowledge to a protagonist while denying her the

corresponding belief (Myers-Schulz & Schwitzgebel 2013). Our studies were created by translating the vignettes and questions from the original studies conducted in English into both Korean and Chinese, and were then carried out among our Korean and Chinese participants.

## 2.1 Probabilistic vs. Perceptual Evidence Effect

There is an ongoing philosophical debate regarding the epistemic status of beliefs based on *probabilistic* evidence in contrast to beliefs based on other sorts of evidence (perceptual evidence as a paradigmatic example).[2] Many argue that the belief that a lottery ticket will be a loser is not an instance of knowledge, despite the overwhelmingly low probability of winning the lottery.[3] This denial of knowledge seems to signal an extremely high standard of knowledge attribution in respect to credence (cf. Hawthorne 2004). However, when confronted with beliefs based on *perceptual* evidence (e.g., the striped animal I see in front of me is a zebra), philosophers do not seem to harbor a similarly high epistemic standard. Even if it is made salient that the striped animal could be a cleverly painted mule, people are generally more willing to regard the true belief that the creature is a zebra as an instance of knowledge. This suggests that knowledge requires something more than high credence, though controversy remains regarding

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[2] The contrast also holds between probabilistic evidence and evidence based on testimony, deduction and so forth. We will focus on the contrast between probabilistic evidence and perceptual evidence for two reasons. First, perceptual evidence is often the ultimate basis for other sources of evidence such as testimony. Second, Friedman and Turri's study, based on which we modeled our study, also focuses on the contrast between probabilistic and perceptual evidence.

[3] For a contrary, minority stand on the issue, see Turri 2011.

precisely which properties disqualify probability-based beliefs as instances of knowledge despite their extremely high probability to be true.

While philosophers have tried to develop a systematic answer to such questions (Dretske 1981; Lewis 1996; Neta 2011), Friedman and Turri (2014) have confirmed that the lay concept of knowledge embodies this feature. Their participants were found to be more willing to attribute knowledge to beliefs based on perceptual evidence (78% and 73% did so in the zoo and farm cases respectively) than on probabilistic evidence (11% did so in the lotto case). The cases are as follows:

*Lotto Case*

Abigail is out shopping with her son. In a store, they see a man with a super lotto ticket. Abigail's son says, "I bet that ticket's not a loser. It might win the jackpot!" Abigail answers, "It is a losing ticket." And Abigail is exactly right: the ticket is a loser.

Question: Does Abigail know or only believe that the ticket is a loser?

*Zoo and Farm Cases* (Differences between the two stories are bracketed)

Abigail is [visiting the zoo/driving past a farm] with her son. In a [pen/field], they see a black-and-white striped animal. Abigail's son says, "I bet that's not a real zebra. It might be a painted mule!" Abigail answers, "It is a real zebra." And Abigail is exactly right: the animal is a zebra.

Question: Does Abigail know or only believe that the animal is a zebra?

Our first study examines whether the perceptual vs. probabilistic evidence effect is cross-culturally universal. We used the authors' original vignettes: lotto, zoo and farm. After translating them into Korean and Chinese, we administrated the study to our Korean and Chinese populations. Participants were randomly assigned to one of the three cases. Beside asking the question "Does Abigail know or only believe that the animal is a zebra?", we also asked them "How confident are you in the answer you just gave? [1(not at all confident) to 7 (completely confident)]."[4]

*Korean Study*

Of the 241 Korean participants recruited through the popular Korean social media and communications platform "Kakaotalk," 210 participants provided correct answers to all of the check questions. The analyses were conducted on the 210 participants who provided correct answers to all the check questions. Following the method first developed by Starmans and Friedman (2012), we used the response to the knowledge attribution question and the reported confidence to calculate a "weighted knowledge ascription" for each participant by multiplying her knowledge attribution response (really knows = 1; only believes = -1) by her reported confidence (1 to 7). Weighted knowledge ascriptions

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[4] We also asked participants other questions as included in Friedman and Turri's original study: check questions, questions about justification, and so forth. For the full list of the questions, see Friedman and Turri 2015, p.1066.

range from -7 (fully confident knowledge denial) to 7 (fully confident knowledge ascription).[5]

The means of the weighted knowledge attribution scores in the three cases above are displayed in Figure 1. As the graph demonstrates, the perceptual vs. probabilistic evidence effect emerged among our Korean participants. A one-way ANOVA showed a significant effect of condition, $F(2, 207)=19.4$, $p<.001$. Tukey's tests showed that the weighted knowledge ascription in the Lotto case ($M=-4.3$, $SD=4.1$) was lower than that in the zoo case ($M=1.4$, $SD=5.9$), $p<.001$, and the Farm case ($M=-.09$, $SD=6.0$), $p<.001$. There was no significant difference between the zoo case and the farm case, $p=.24$.

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[5] This computation is applied uniformly to the first two studies in the paper, and we will not repeat it when reporting the other study.
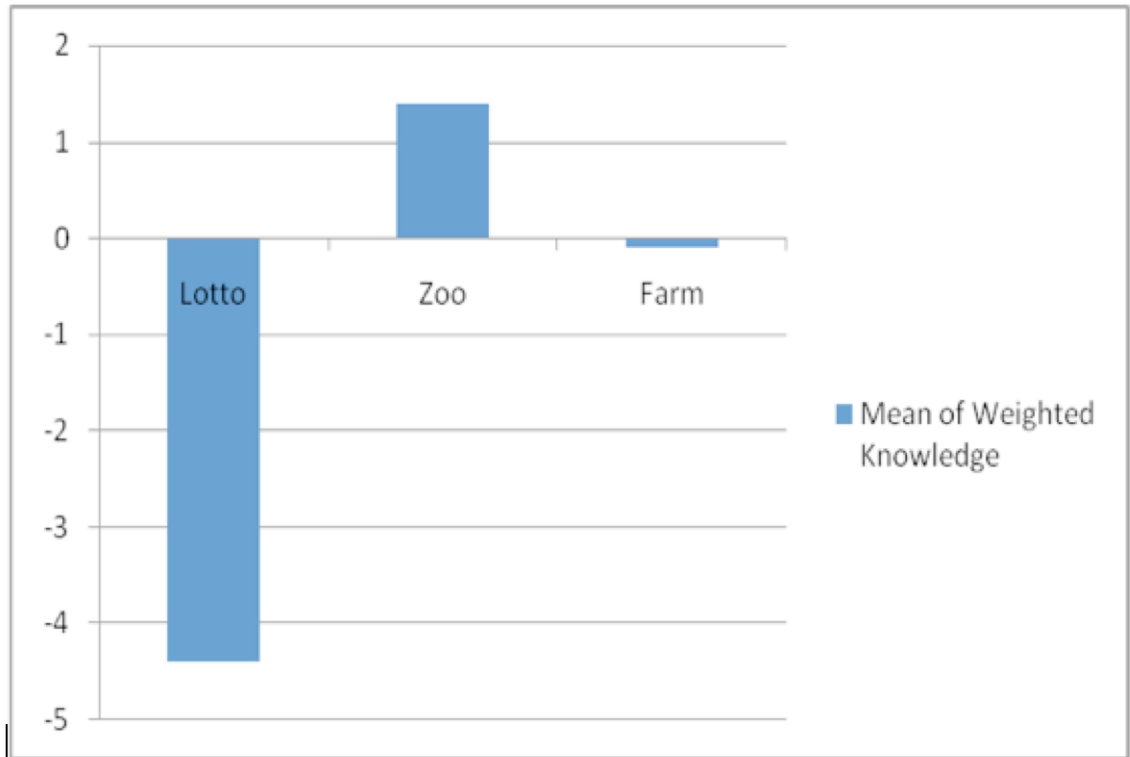
**Figure 1: Mean of Korean participants' weighted knowledge ascriptions about perceptual vs probabilistic evidence effect**

*Taiwanese Study*

Among our 84 Taiwanese participants, recruited on the popular social media and communications platform "Line," 78 participants provided correct answers to all of the check questions. Analyses were conducted on these participants.

As Figure 2 indicates, we found that the perceptual vs probabilistic evidence effect emerged in our Taiwanese population as well. A one-way ANOVA showed a significant effect of condition, $F(2, 75)= 13.1$, $p<.001$. Tukey's tests showed that the weighted knowledge ascription in the Lotto case ($M= -4.65$, $SD=4.0$) was lower than that in the zoo

case (*M*=2.4, *SD*=5.9), *p*<.001, and the farm case (*M*=2.2, *SD*=5.7), *p*<.001. There was no significant difference between the zoo case and the farm case, *p*=.99.
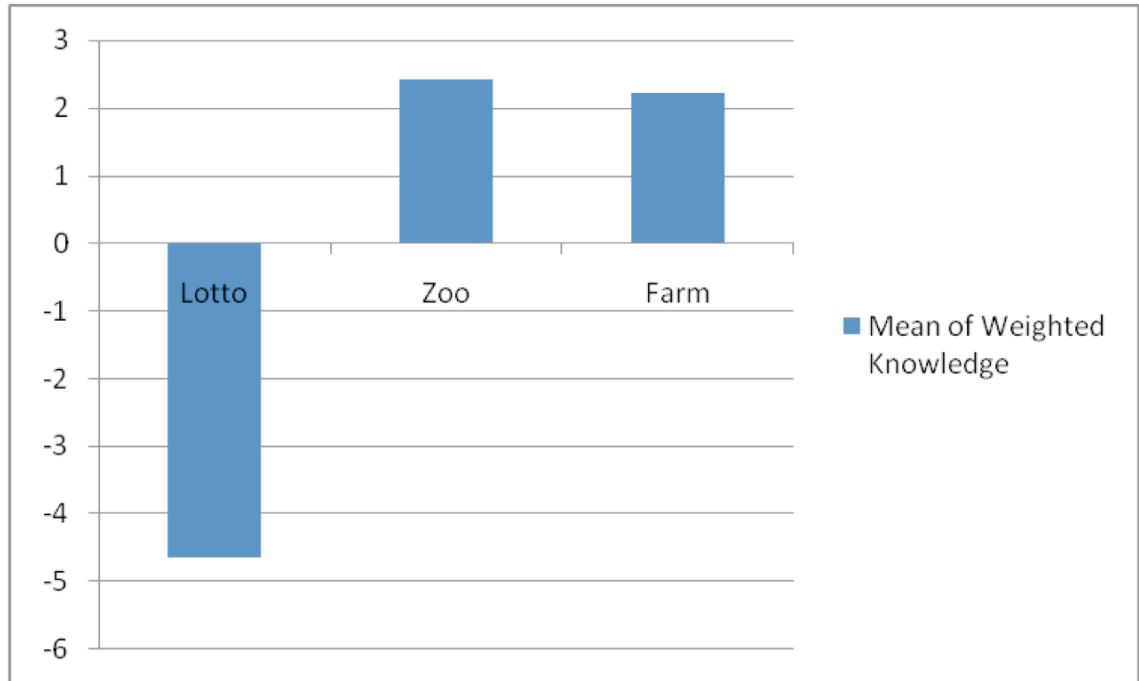


**Figure 2: Mean of Taiwanese participants' weighted knowledge ascriptions about perceptual vs probabilistic evidence effect**

*Discussion*

In summary, our studies found that the perceptual vs probabilistic evidence effect observed in Friedman and Turri's Anglo-American population also emerged in Korean and Taiwanese populations. Namely, participants from all three populations were more likely to attribute knowledge to beliefs based on perceptual evidence than beliefs based on probabilistic evidence.

**2.2 Gettierized Epistemic Side-Effect Effect (GESEE)**

Knowledge is concerned with evidence, justification, reliability, the soundness of deductive and inductive reasoning, and so forth—in other words, whatever faithfully leads to truth. Many philosophers think of knowledge exclusively as the hallmark of truth that must be acquired in the right ways. Recently, however, an increasing number of philosophers have started to look beyond factors that link knowledge to truth. They observe that besides the tight conceptual link between knowledge and truth, knowledge is also tightly linked to action, skill, norms of communication and so forth (cf. e.g., Fantl and McGrath 2010; Stanley 2005) This sheds light on an array of factors that have long been ignored in epistemology, and also raises empirical questions about whether the lay concept of knowledge is sensitive to those factors (cf. e.g., Schaffer & Knobe 2010; Sripada and Stanley 2012).

Beebe and Buckwalter (2010) introduced yet another layer of complexity when they first reported empirical evidence that our concept of knowledge is also responsive to moral valence. Buckwalter (2013) further observed that moral valence would affect ordinary folk knowledge attribution even in Gettierized cases. The following is a pair of cases (with harm/benefit variants—the manipulated words in either variant are in the brackets) tested in Buckwalter's 2013 study:

[Pump Case] Sam's job is to pump water into the cistern, which then supplies the water to the farms owned by several families in the community. One day, as Sam operates the pump, he hears a broadcast on the radio. The radio report says that local officials suspect a new chemical from a nearby factory, chemical X, may have found its way into the local reservoir, and that there is a chance it will be very

[beneficial/poisonous] to all the local townspeople's crops. Sam thinks to himself, "I don't care about their crops; I just want to earn my pay," and continues pumping the water. Sure enough, the crops started [thriving/dying]. It turned out that the local officials were completely wrong about the chemical in the water. After analyzing the water, they found no trace of chemical X. Scientific reports later confirmed that the crops were all [thriving/dying] because of a fungus that had been secretly growing inside Sam's pump.

After reading the case, participants were asked whether they agreed or disagreed with the statement, "Sam knew that by pumping the water, the townspeople's crops would [thrive/die]." Responses were collected on a seven-point scale from 1 (strongly disagree) to 7 (strongly agree). The Gettierized nature of the case would predict that the participants deny knowledge to Sam in both cases. But Buckwalter's results show this expected result did not hold. Participants' Gettier intuitions were overturned by their moral judgments of Sam in the harm condition: participants thought that Sam knew his actions would bring about harm (M=4.86, SD=1.7). In contrast, responses for the benefit condition were consistent with traditional Gettier case results: participants thought that Sam did not know (M=3.05, SD 1.59). Thus, Buckwalter's results indicate not only that the lay concept of knowledge is sensitive to moral valence, but also that the moral factor can override the Gettier intuition, which is generally considered central to our understanding of knowledge. He refers to the robust impact of moral valence on people's

knowledge attribution in Gettier cases[6] as the *Gettierized Epistemic Side-Effect Effect*, or GESEE.

Responding to the concern that knowledge attribution in the harm case is driven by the desire to blame the protagonist, Buckwalter introduced a third-person case where the purported knower differs from the wrongdoer. He found that in the third-person case, people were still much more likely to attribute knowledge to the knower in the harm condition than in the benefit condition. This suggests that moral valence has a robust impact on the lay concept of knowledge that cannot be explained away by the desire to blame the wrongdoer.[7]

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[6] GESEE captures the robust impact of moral valence on knowledge attribution. This impact does not always overturn the Gettier intuition as in our Chinese studies. Following Buckwalter, we refer to the epistemic side-effect effect obtained in Gettierized cases as GESEE, no matter whether the Gettier intuition is obtained in those cases.

[7] Based on his studies, Buckwalter (2013: 377) concludes that morality plays an important role in knowledge attribution. Two approaches may explain the observation: either moral valence directly affects knowledge attribution, or moral valence affects some mediating factor(s) which in turn affect(s) knowledge attribution. For example, Alfano, Beebe and Robinson (2012) argues that differently valenced side-effects engender asymmetric attributions of beliefs, which in turn generates asymmetric attribution of knowledge. Other mediating factors proposed to explain the original side-effect effect on intentionality attribution might, *mutatis mutandis*, also help explain GESEE (cf. Guglielmo & Malle, 2010; Uttich & Lombrozo, 2010; Sripada, 2012, and Scaife & Webber, 2013). Cova, Lantian, and Boudesseul (2016) show that even when controlling for those proposed mediators in mediation analyses, the direct impact of normative considerations remains significant, which suggests that "moral evaluations still play an irreducible role in shaping our judgments of intentionality" (2016: 12). Since we aim to investigate the unviersality of the pattern of knowledge attribution, we do not take a stance on which explanation is correct.

Our second study examined whether GESEE appears across different cultures. We translated the three vignettes (pump, mayor, third-person mayor) used in Buckwalter's paper[8] into Korean and Chinese, and tested them with our Korean and Chinese participants.

*Korean Study*

753 Korean participants were recruited through "IQEQCQ." As Figure 5 shows, the GESEE appeared across all three vignettes with our Korean participants.

We analyzed the data using a 3 (vignette: pump vs. mayor vs. third-person) x 2 (valence: benefit vs. harm) ANOVA. There was a significant main effect of valence, $F(1, 747) = 67.6$, $p<.001$, a significant main effect of vignette, $F(2, 747) = 19.6$, $p<.001$, and a significant interaction, $F(2, 747) = 3.6$, $p=.03$.

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[8] The mayor case and the third-person mayor cases can be found in the appendix.
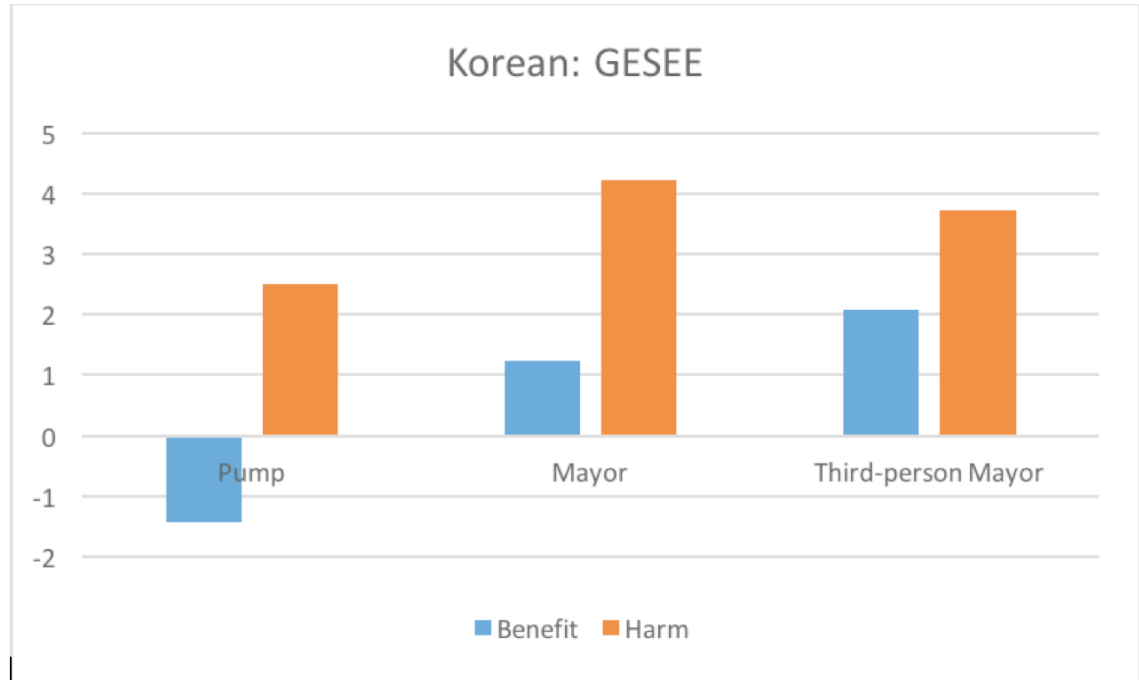
**Figure 3: Mean of Korean participants' weighted knowledge ascriptions about GESEE[9]**

*Chinese Study*

We recruited 840 Chinese participants through a public account on "WeChat." As Figure 5 shows, the GESEE appeared in the first two cases (pump and mayor) but did not appear in the third-person mayor case.

We analyzed the data using a 3 (vignette: pump vs. mayor vs. third-person mayor) x 2 (valence: benefit vs. harm) ANOVA. We found a main effect of valence, $F(1, 834) =$

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[9] Notably, for our Korean participants, the patterns of knowledge attribution across the three pairs of cases are almost exactly the same with the patterns reported by Buckwalter based on his English-speaking participants. First, in the pump cases, the Gettier intuition holds, and GESEE overrides it in the harm condition. Second, in the mayor and the third-person mayor cases, the Gettier intuition does not hold, but GESEE is robust. The story is more complicated with our Chinese participants.

11.5, *p*=.001, a main effect of vignette, $F(2, 834) = 39.3$, *p*<.001, and a significant interaction, $F(2, 834) = 4.6$, *p*=.01.

To further explore this interaction, we examined each vignette separately. For the pump case, the weighted knowledge score was higher for the harm condition (*M*=-.2.01, *SD*=5.31) than the benefit condition (*M*=-3.00, *SD*=4.94), $t(252)=-4.15$, but the difference was not statistically significant, *p*=.098. For the mayor case, the weighted knowledge score was higher for the harm condition (*M*=2.67, *SD*=5.17) than the benefit condition (*M*=-0.19, *SD*=5.78), $t(297)=-1.66$, *p*<.001. For the third-person mayor case, the weighted knowledge score for the benefit condition (*M*=.62, *SD*=5.62) was very close to that for the harm condition (*M*=.64, *SD*=5.48), $t(275)= -0.03$, so there was virtually no difference, *p*=.98.
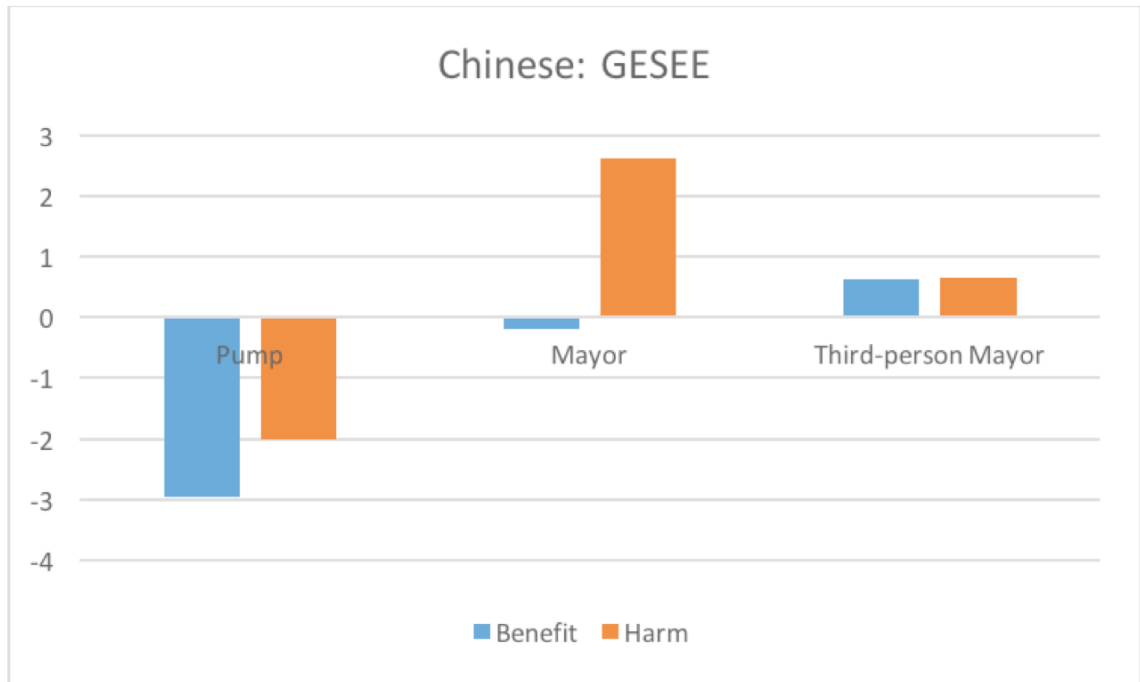
**Figure 4: Mean of Chinese participants' weighted knowledge ascriptions about GESEE[10]**

*Chinese Third-Person Study*

The results for the third-person mayor case may be due to (1) case-specific reasons (e.g., Chinese people have some peculiar ideas about mayors or their secretaries) or (2) the third-person nature of the case (i.e., Chinese people would respond to all third-person cases in a way that differs from how they respond to first-person cases). We conducted a second study on Chinese speakers in order to identify the correct explanation. We

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[10] The results of our Chinese study differed from that of Buckwalter's English study and that of our Korean study in various subtle ways. First, in the pump cases, the Gettier intuition held, but GESEE didn't override it in the harm condition. Second, in the mayor cases, the Gettier intuition held weakly, and GESEE overrode it in the harm condition. Third, in the third-person mayor cases, the Gettier intuition didn't hold, neither did GESEE.

designed two new third-person cases (the third-person pump and the third-person air case), and tested them alongside the original third-person mayor case on a new sample of Chinese participants (N=434) recruited on "Wechat". The cases have the same structure as the third-person mayor case: the purported knower is a witness to the agent performing the benefit/harm action. Below is an English translation of the third-person pump case.[11]

Wen Bin's job is to pump water into the cistern, which then supplies the water to the farms owned by several families in the community. One day, as Wen Bin operates the pump, he hears a broadcast on the radio. The radio report says that a new chemical from a nearby factory, chemical X, has found its way into the local reservoir, and that it will be very [beneficial/poisonous] to all the local townspeople's crops. Wen Bin continues pumping the water while chatting with his girlfriend, ''I don't care about their crops; I just want to earn my pay.'' Wen Bin's friend, Li Ming, overheard everything, and is appalled by what Wen Bin said. Sure enough, the crops started [thriving/dying]. It turned out that the radio broadcast got it wrong about the chemical in the water. After analyzing the water, scientists found no trace of chemical X at all. And later scientific reports further confirmed that the crops were all [thriving/dying] due to a totally different cause, i.e., a fungus that had been secretly growing inside the pump.

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[11] The Chinese third-person air and the Chinese third-person mayor case can be found in the appendix.

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After reading the case, we asked the participants: "Do you agree or disagree with the statement, "Li Ming, Wen Bin's friend, knew that the townspeople's crops would [thrive/die], as he heard the broadcast and Wen Bin's words"?"

We analyzed the responses using a 3 (vignette: pump vs. air vs. job) x 2 (valence: benefit vs. harm) ANOVA. We found a main effect of valence, $F(1, 428) = 8.9$, $p=.003$, no effect of vignette, $F(2, 428) = 1.6$, $p=.21$, and a significant interaction, $F(2, 428) = 4.4$, $p=.01$.

To explore this effect further, we examined each vignette individually. For the third-person pump case, the weighted knowledge score was higher for the harm condition ($M=-.48$, $SD=5.57$) than the benefit condition ($M=-3.3$, $SD=4.60$), $t(136)= -3.23$, $p=.002$. For the third-person air case, the weighted knowledge score was higher for the harm condition ($M=-.22$, $SD=5.52$) than the benefit condition ($M=-2.39$, $SD=5.11$), $t(145)= -2.47$, $p=.014$. For the third-person mayor case, there was no significant difference between the weighted knowledge for the benefit condition ($M=-.2.09$, $SD=5.35$) and the harm condition ($M=-2.65$, $SD=4.77$), $t(147)= 0.68$, $p=.50$. GESEE appeared in all cases except *again* for the third-person mayor case (Figure 5).
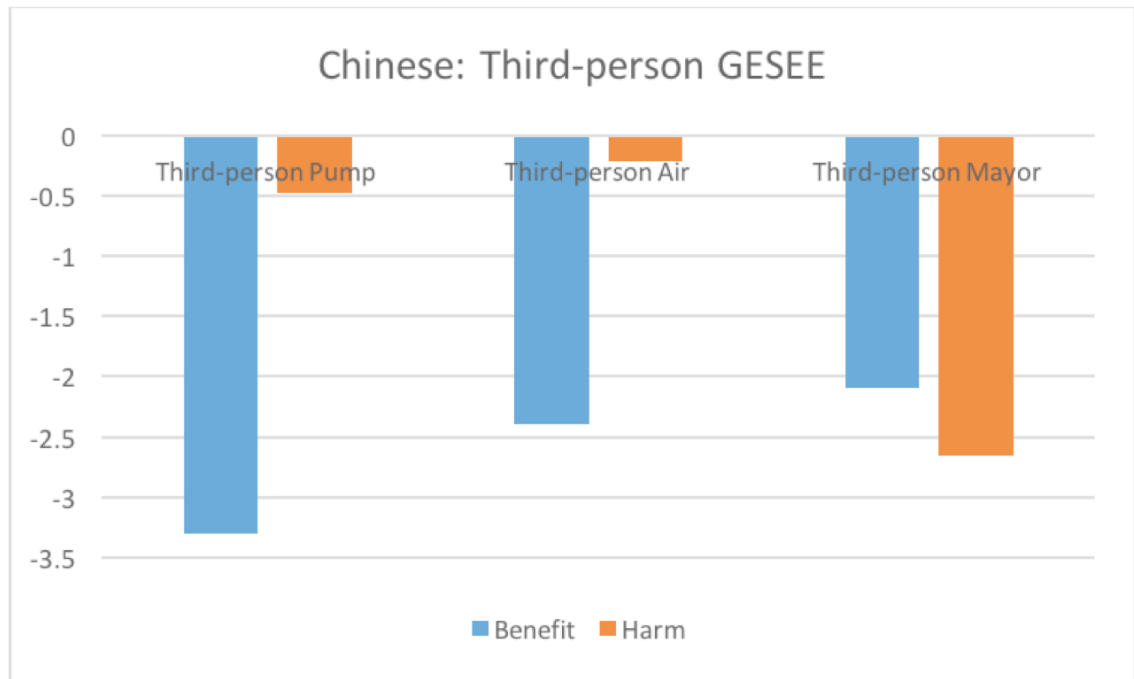
**Figure 5: Mean of Chinese participants' weighted knowledge ascriptions about third-person cases for GESEE**

This result suggests that the absence of a significant GESEE in the Chinese participants for the third-person mayor case is due to case-specific reasons: Chinese people have some specific ideas about mayors and secretaries which interfered with their GESEE intuition. In other third-person cases, Chinese participants demonstrated the same pattern of GESEE. There was a significant difference in the level of knowledge attribution for the harm and benefit conditions.[12]

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[12] Though the GESEE pattern didn't emerge both in our first and our second study of the third-person mayor case, participants' responses to the case differed quite dramatically in the two studies. The weighted

*Discussion*

Both Korean and Chinese populations were found to exhibit GESEE. The results for both populations showed a striking asymmetry of knowledge attribution between harm and benefit conditions. Though this effect was not obtained in the third-person mayor case among our Chinese participants, Chinese participants indeed demonstrated GESEE in the other third-person cases. This outcome indicates that the Chinese result in the third-person mayor case was due to case-specific reasons, rather than reflecting anything more fundamental about their tendency to show the third-person GESEE.

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knowledge scores (both in the benefit and harm condition) in the first Chinese study were positive meaning that the Gettier intuition didn't hold, while those scores became negative in the second Chinese study, meaning that the Gettier intuition held. We think that the difference might be attributed to our different ways of framing the questions after participants read the vignette. In the first Chinese study, we gave participants the translation verbatim of Buckwalter's third-person mayor case and the question followed, where we asked participants: "Do you agree or disagree with the statement, 'James the office secretary knew that members of the local community would [get/lose] jobs'?" In the second Chinese study, we changed the office secretary's name James into *Li Ming*, and framed the question differently, where we asked participants: "Do you agree or disagree with the statement, 'Li Ming, the office secretary knew that members of the local community would [get/lose] jobs, *as he heard the conversation between the mayor and his economic strategists*'?" (see the appendix). We think that the temporary element highlighted in the questions of our second Chinese study helped to prompt participants' Gettier intuition. At the time when Li Ming heard the conversation between the mayor and the economic strategists, the mayor and the economic strategists were deliberating about a contract which was latter secretly swapped by the company and thus was not the one actually causing job increase/decrease. The presence of the temporary element was likely to prime the participants to focus on the causal disconnection between the facts of the world and Li Ming's true belief about it, and thus led them to the denial of knowledge in both the harm and benefit conditions.

## 2.3 Knowing without Believing

Knowledge used to be analyzed in terms of justified true belief. According to such an analysis, knowledge entails belief. Though this once-standard analysis has been discredited largely thanks to Gettier cases, the idea that knowledge entails belief continues to prevail among epistemologists. Proponents of the idea tend to rely on its intuitive appeal rather than theoretical arguments (Cohen 1966; Armstrong 1969, 1973; Sorenson 1982; Dartnall 1986; Steup 2001/2006). This makes their position vulnerable to counterexamples.

In a recent empirical study, Myers-Schulz and Schwitzgebel (2013) presented five potential scenarios of knowledge without belief to ordinary English speakers. Each participant received only one scenario, with only one question at the end of it asking either whether the protagonist knew or believed the proposition in question. In three of the five scenarios, they found a significant effect where more people attributed knowledge but not the corresponding belief to the protagonist: 87% vs. 37% in the unconfident examinee case, 63% vs. 23% in the prejudiced professor case, and 83% vs. 30% in the freaked-out movie-watcher case. The three pairs of cases went as follows:

(1) The unconfident examinee (modified from Radford 1966):

Kate spent many hours studying for her history exam. She's now in class taking the exam. Everything's going quite well, until she comes to the final question. It reads, "What year did Queen Elizabeth die?" Kate had reviewed this date many times. She had even recited the date to a friend just a few hours earlier. So, when Kate sees that this is the last question, she feels relieved. She confidently looks down at the

blank space, waiting to recollect the answer. But before she can remember it, the teacher interrupts and announces, "Alright, the class session is almost over. You have one more minute to finalize your answers." Kate's demeanor suddenly changes. She glances up at the clock, now flustered and worried. "Oh, no. I can't perform well under this kind of pressure." Her grip tightens around her pencil. She strains to recall the answer, but nothing comes to her. She quickly loses confidence. "I suppose I'll just have to guess the answer," she says to herself. With a sigh of disappointment, she decides to write "1603" into the blank space. This was, in fact, the correct answer.

Did Kate know/believe that Queen Elizabeth died in 1603? yes no (circle one)

(2) The prejudiced professor (modified from Schwitzgebel 2010):

Juliet is a university professor. Unfortunately, she is also prejudiced against student athletes. In her classes, she calls more often on non-athletes than athletes, and she interprets the comments of the former more charitably. When two soccer players, Brett and Bernard, come to visit her in office hours, she treats them patronizingly, explaining the basic concepts of the course in a very rudimentary manner, failing to recognize the sophistication and intelligence behind their questions. They leave, and shortly after, two students with no involvement in school sports enter. Juliet immediately launches into a high-level discussion, generously assuming the students' command of the elementary material. When Bernard writes the best essay in the course, revealing the intelligence that a neutral observer would have

recognized in his previous remarks, Juliet is surprised. All of this is typical of her. However, Juliet also repudiates all forms of prejudice. She openly affirms that students involved in athletics are just as capable as non-athletes. In fact, she has it on excellent authority that this is the case: Her chair just completed a study showing that the two groups perform equally well in their philosophy classes. Intrigued by this study, Juliet even reviews her own records and finds that, on average, the athletic students had actually performed better than the other students. But, in spite of all this, Juliet's prejudice remains. She continues to treat her athletic students as if they are less intelligent than her other students.

Does Juliet know/believe that her athletic students are as capable as her other students? yes no (circle one)

(3) The freaked-out movie-watcher

Susan loves to watch old horror films. She finally convinces her friend Jamie to watch one with her. It's an old horror film that Susan actually considers to be quite funny, due to its unrealistic plot. The film begins with a group of astronauts who discover alien life on another planet. The aliens look somewhat like bumblebees, but they are dark-green and about two feet in length. The astronauts capture one of these creatures and bring it back to Earth. Once they have it on Earth, it manages to escape and starts laying numerous eggs. The eggs need water to hatch, so the creature lays the eggs in sink faucets. Thus, whenever people turn on their sink faucet, hundreds of newly hatched alien creatures fly out and begin to attack them.

During one of these attack scenes, Susan notices that Jamie is a bit tense. Susan remarks, "This isn't bothering you, is it? Come on, you should be laughing at this movie. Look how unrealistic it is." Jamie responds, "Yes, of course it's unrealistic. But it's still scary. I just don't like these types of movies. They frighten me. Can't we just watch something else?" "Well, I suppose," Susan says. Susan then turns off the movie, and they quickly get ready for a second trip to the movie store. On the way out, Susan stops. "Hold on for a second. I'm thirsty. Let me grab a glass of water." Susan walks over and begins to turn on the sink faucet. Suddenly, Jamie shouts, "No! Don't do it!" The words come out of Jamie's mouth before she even has time to consider what she's saying. Jamie then looks over and sees that it's only water coming out of the faucet.

Did Jamie know/believe that only water would come out of the sink faucet? yes no (circle one)

Myers-Schulz and Schwitzgebel's finding provides strong evidence against the commonly assumed conceptual claim that knowledge entails belief. Our third study examined whether similar phenomena of knowledge without belief appear in other cultures. We translated the three scenarios (the unconfident examinee, the prejudiced professor, and the freaked-out movie-watcher) used in Myers-Schulz and Schwitzgebel's study into Korean and Chinese, and tested them with our Korean and Chinese participants.

Korean Study

We asked a few Korean friends to share our survey link with their students and colleagues, who were largely non-philosophers. We recruited 209 Korean participants in this way. 159 out of the 209 participants recruited online provided complete data. The analyses were conducted on those 159 participants.

For the unconfident examinee vignette, a higher percentage of participants agreed that the agent knew (65.0%) than that the agent believed (15.0%), $\chi^2(1, N = 40) = 10.4$, $p = 0.001$. For the prejudiced professor vignette, a higher percentage of participants agreed that the agent knew (80.0%) than that the agent believed (36.4%), $\chi^2(1, N = 63) = 12.2$, $p < 0.001$. For the freaked-out movie-watcher vignette, a higher percentage of participants agreed that the agent knew (50.0%) than that the agent believed (35.3%), but this difference was not significant, $\chi^2 (1, N = 56) = 1.2$, $p = 0.275$.

To determine whether the movie case is in fact different from the other cases, we analyzed the data using two binary logistic regression models. In the first model we entered as predictors condition (knowledge vs. belief) and two dummy codes for the vignette (Movie, Professor). In the second model we also included two interaction terms (Movie x condition, Professor x condition). The comparison of these models indicated that condition did not significantly interact with the vignette, $\chi^2 (2, N = 159) = 0.31$, $p = 0.86$.
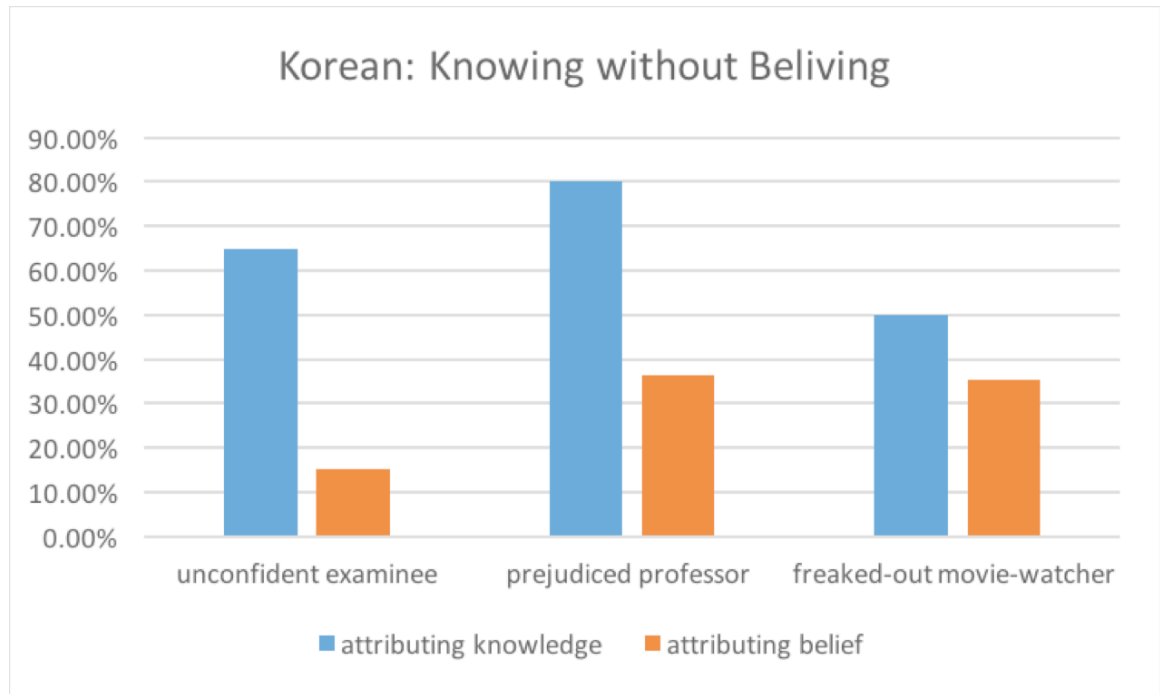
**Figure 6: Percentage of Korean participants who attributed knowledge or belief**

Chinese study

We recruited 751 Chinese participants through the popular communication platform WeChat, and 613 of them provided complete data. The analyses were conducted on those 613 participants.

For the unconfident examinee vignette, a higher percentage of participants agreed that the agent knew (79.3%) than that the agent believed (45.3%), $\chi^2(1, N = 206) = 25.6$, $p < 0.001$. For the prejudiced professor vignette, a higher percentage of participants agreed that the agent knew (64.4%) than that the agent believed (29.9%), $\chi^2(1, N = 208) = 24.8$, $p < 0.001$. For the freaked-out movie-watcher vignette, a higher percentage of

participants agreed that the agent knew (75.7%) than that the agent believed (31.3%),
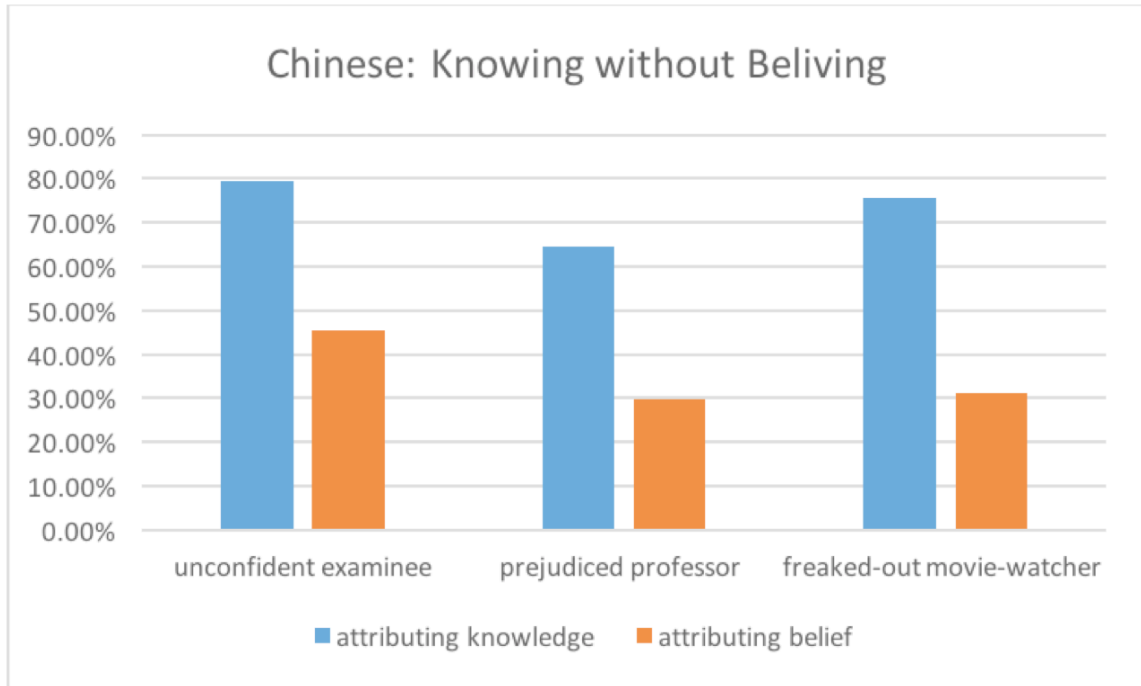
$\chi^2(1, N=199) = 39.6, p < 0.001.$



**Figure 7: Percentage of Chinese participants who attributed knowledge or belief**

Discussion

In light of our results, both Korean and Chinese populations shared the intuition that an agent can know a proposition without believing it. The difference in knowledge and belief distribution was significant in all the three scenarios, i.e., the unconfident examinee, the prejudiced professor, and the freaked-out movie watcher in our study among Chinese speakers, as it was in the original study conducted by Myers-Schulz and Schwitzgebel with English speakers. While the difference in knowledge and belief

distribution was also significant in both the unconfident examinee and the prejudiced professor scenarios among our sample of Korean speakers, it was not significant in the freaked-out movie watcher scenario. However, as the binary logistic regression models show, this difference between the freaked-out movie watcher scenario and the other two scenarios in this Korean study was not itself significant.

## 3. Conclusion

Our studies examined three epistemic effects in three groups outside the US (South Korea, Taiwan and China): the perceptual vs probabilistic evidence effect; the Gettierized epistemic side effect effect (GESEE); and the knowing without believing effect. (1) Korean and Taiwanese participants, like Anglo-American participants in Friedman and Turri (2014), were more likely to attribute knowledge to beliefs based on perceptual evidence than on probabilistic evidence. (2) Chinese and Korean participants, resembling Anglo-American participants in Buckwalter's (2013), demonstrated a striking asymmetry of knowledge attribution when an agent was harming rather than benefiting others. (3) Like Anglo-American participants in Myers-Schulz and Schwitzgebel (2013), Chinese and Korean participants think an agent can know a proposition without believing it. In sum, each of the effects that we studied showed up in both cultural groups that we tested.

Along with other work reporting cross-cultural convergences on patterns of knowledge attribution (Machery et al. 2017; Rose et al. 2017), our studies provide empirical evidence for the hypothesis that there is at least a core concept of knowledge that is commonly shared across cultures. Moreover, our studies shed new light on the shape of this core concept of knowledge. Given that patterns of knowledge attribution as

quirky and surprising as those we tested hold across cultures, we can reasonably expect significant overlap among the concepts of knowledge employed in various linguistic communities.

The discussion to date about cross-cultural studies has predominantly focused on supposed cross-cultural differences, rather than similarities. Sparked largely by WNS, the dominant question has been, "What are the philosophical implications of cross-cultural differences in epistemic intuitions?" By focusing on such questions, interlocutors presupposed the existence of cross-cultural differences. However, the total body of evidence to date on cross-cultural intuitions does not support the existence of such differences. Instead of contemplating the implications of unfounded cross-cultural *differences,* we suggest that we further explore the significant cross-cultural *universality* of epistemic intuitions. This shift in philosophical focus would have the benefit of opening up a cluster of important questions for epistemology: (1) how far or how deep universality runs; (2) what best explains the robust universality; and (3) given the high degree of universality, what role intuition should play in epistemology. Though we will not be able to answer those questions, we want to suggest some ways in which such an inquiry could be fruitful.

Concerning the first question, though evidence made available thus far—in Machery et al. (2017), Rose et al. (2017), and the current paper—suggests that patterns of knowledge attribution are robustly universal across cultures, future studies may find interesting cross-cultural divergences of knowledge attribution and thus help to demarcate the boundaries of this universal, core concept of knowledge.

Concerning the second question, at least two accounts seem both plausible as explanations of the robust universality of knowledge attribution supported by the current body of evidence: the pragmatist and the nativist explanation. According to the pragmatists (e.g., Craig 1990), we have a certain concept of knowledge because of its beneficial functions, for example, in preserving truth, identifying trustworthy informants, coordinating behaviors through enabling effective mind-reading.[13] If we are to add a further plausible assumption that the ends served by the concept of knowledge largely converge across cultures, we can expect robust universality of the concept of knowledge across cultures (cf. Hannon 2015). Trial-and-error in social practice selects out useful applications of the concept and solidifies the meaning of "knowledge." Rewards-and-sanctions for new language learners (e.g., children) further spread and pass on the stable patterns of knowledge attribution.

By contrast, according to the nativists, the basic concept of knowledge has been planted in human minds as a matter of our genetic make-up, which dictates (at least to a great extent) when we would attribute/deny knowledge in a given case.[14] Recently, the innateness of the concept of knowledge has obtained some empirical support: both young

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[13] Craig (1990) offers a systematical elaboration and defense of the pragmatic understanding of the concept of knowledge. He singles out certifying reliable informants as the purpose of the concept of knowledge. Though we see merits of the pragmatic approach to analyzing the concept of knowledge, we share many critics' skepticism that the concept of knowledge serves any unique purpose (c.f., for example, Rysiew 2012; Beebe 2012).

[14] This particular claim about our concept of knowledge fits into a broader picture of nativism expounded by Scholl and Leslie (1999), which holds that certain concepts in theory of mind (including belief, pretense, desire, and so forth) are innate.

children and other primates demonstrate a certain basic concept of knowledge—in the sense of immediate, accurate representation of reality—which they employ to make predictions about others' behavior (cf. Hogrefe et al. 1986; Wellman & Liu 2004; Onishi & Baillargeon 2005; Marticorena et al. 2011).

Theorists have argued that the innate concept of knowledge shared by babies and non-human primates would be too primitive to adequately explain the universality of our epistemic intuitions in highly sophisticated scenarios (e.g., Stich 2013). For example, if it turns out that the innate, basic core concept of knowledge is limited to immediate, accurate presentations of reality, a nativist account may have difficulty in explaining the universality of GESEE (cf. Part II, Sec. 2), as immediate accurate representations of reality are not sensitive to the moral valence of an action. We need further empirical studies, especially in primatology and developmental psychology, before we can confidently come down on one side between these competing accounts.

Finally, many epistemologists take our epistemic intuitions as foundational building blocks for normative epistemological theories, which aim at elaborating the proper norms of, e.g., inquiry, belief-formation, and assertion. The robust universality of epistemic intuitions provides *pro tanto* justification for this evidential role that epistemologists have attributed to epistemic intuitions. Regardless of whether pragmatism or nativism turns out to be the right explanation for the robust universality, both accounts suggest that the concept of knowledge serves crucial functions. This is obviously true if pragmatism is the right explanation, but it is also likely to be the case even if nativism is true. An innate concept of knowledge that helps human survival and flourishing is more likely to be selected in the evolutionary process. If we still regard those ends as desirable,

it would be advisable to consult our epistemic intuitions for normative purposes. This would be true, especially in light of J.L. Austin's comment:

> Our common stock of words embodies all the distinctions men have found worth drawing, and the connexions they have found worth marking, in the lifetimes of many generations: these surely are likely to be more numerous, more sound, since they have stood up to the long test of the survival of the fittest, and more subtle, at least in all ordinary and reasonably practical matters, than any that you or I are likely to think up in our arm-chairs of an afternoon—the most favoured alternative method (Austin 1956).

Giving a *pro tanto* evidential role to our epistemic intuitions does not mean that we simply defer to our *de facto* concept of knowledge as we build a normative epistemology. First, our innate concept of knowledge may be too thin to support elaborate epistemological theories. Second, what was beneficial for hunter-gathers may not be beneficial for those who live in the modern world. Finally, a unified concept of knowledge may have been called upon to serve multiple ends, for example, not only to guide our effort to discover "pure" theoretical truths but also to ground our moral criticism of the wrong-doers (as GESEE seems to suggest).[15] There is no guarantee that

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[15] Though the third-person GESEE helps to mitigate the worry that the asymmetry of knowledge attribution in harm and benefit conditions is directly driven by the desire to blame the wrong-doer, it doesn't rule out that the asymmetry is caused by the general, communal need to hold the wrong-doers responsible. Maybe because we want to attribute knowledge to the wrong-doer in order to hold him

those tasks are always mutually conducive or even compatible. Epistemologists have to make hard choices about prioritizing certain epistemic intuitions and discarding others when our epistemic intuitions are in tension. By searching for a reflective equilibrium, we will arrive at a refined concept of knowledge along with more elaborate norms for our epistemic practices.

Having presented a sketch of what the coming discourse might look like after we shift our focus to epistemic universality, we would like to conclude our paper with an invitation for thinkers from wide-ranging academic circles (from experimental philosophy, traditional philosophy, psychology, primatology) to explore epistemic universality—its depth, explanations, and implications. We hope that this universality-based discussion will transcend the differences-based debate.

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responsible, we also attribute knowledge to the observer who enjoys a similar level of evidence in order to be consistent.

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**Appendix**

The mayor case from Buckwalter 2014

The mayor of a small town is trying to decide whether or not to sign a new contract with a local corporation. The math is all very complex, but all his economic strategists think that there's a relatively good chance that one outcome is that it will [create/cut] jobs for workers in the community. The mayor says, ''all I really care about is campaign contributions, not people's jobs, and I am sure to get millions from the corporation if I agree.'' So, he decides to sign their contract. The corporation, however, didn't take any chances. They secretly switched the contract with a totally different one right before the mayor signed it. By changing all the fine print, in some cases the opposite of what the mayor thought he was signing, the corporation could be sure it got what it wanted. Sure enough, shortly after the mayor signed the contract, a number of members of the community [got/lost] jobs, and the mayor received a huge donation to his reelection campaign.

At the end of the story:

Do you agree or disagree with the statement, "The mayor knew that by signing the contract he would [create/cut jobs]"?


The third-person mayor case from Buckwalter 2014

The mayor of a small town is trying to decide whether or not to sign a new contract with a local corporation. The contract is very complex, but all his economic strategists think that there's a relatively good chance that one outcome is that it will [create/cut] jobs for workers in the community. The mayor says, ''all I really care about is campaign contributions, not people's jobs, and I am sure to get millions from the corporation if I agree.'' James the office secretary overheard everything, and is appalled by what the mayor said. Nonetheless, the mayor decides to sign the contract. The corporation, however, didn't take any chances. They secretly switched the contract with a totally different one right before the mayor signed it. By changing all the fine print, in some cases the opposite of what the mayor thought he was signing, the corporation could be sure it got what it wanted. Sure enough, shortly after the mayor signed the contract, a number of members of the community [got/lost] jobs, and the mayor received a huge donation to his reelection campaign.

After the story:

Do you agree or disagree with the statement, ''James the office secretary knew that members of the local community would [get/lose] jobs''?


The Chinese third-person pump case

Wen Bin's job is to pump water into the cistern, which then supplies the water to the

farms owned by several families in the community. One day, as Wen Bin operates the pump, he hears a broadcast on the radio. The radio report says that a new chemical from a nearby factory, chemical X, has found its way into the local reservoir, and that it will be very [beneficial/poisonous] to all the local townspeople's crops. Wen Bin continues pumping the water while chatting with his girlfriend, ''I don't care about their crops; I just want to earn my pay.'' Wen Bin's friend, Li Ming, overheard everything, and is appalled by what Wen Bin said. Sure enough, the crops started [thriving/dying]. It turned out that the radio broadcast got it wrong about the chemical in the water. After analyzing the water, scientists found no trace of chemical X at all. And later scientific reports further confirmed that the crops were all [thriving/dying] due to a totally different cause, i.e., a fungus that had been secretly growing inside the pump.

Do you agree or disagree with the statement, "Li Ming, Wen Bin's friend, knew that the townspeople's crops would [thrive/die], as he heard the broadcast and Wen Bin's words"?


The Chinese third-person air case

The vice-president of a company went to the chairman of the board and said, "we are thinking of starting a new program. Based on careful and convincing analysis offered by our financial and tech experts, it will help us increase profits, but it will also [improve/harm] air quality of the city." The chairman of the board answered, "I don't care at all about the air quality. I just want to make as much profit as I can. Let's start the new program." Thus, they decided to start the new program. The secretary of the chairman, Li Ming, overheard everything, and is appalled by what the chairman said. Sure enough,

shortly after the company started the new program, the air quality was [improved/harmed]. It turned out that the experts in the company got it wrong about the environmental effects of the new program. The new program actually has no effect at all to the air. The fact that the air quality had been [improved/harmed] was due to a totally different cause, i.e., a new waste disposal plant that had started to operate.

Do you agree or disagree with the statement, "Li Ming, the secretary of the chairman, knew that the air quality would be [improved/harmed], as he heard the conversation between the vice-president and the chairman"?


The Chinese third-person mayor case

The mayor of a small town is trying to decide whether or not to sign a new contract with a local corporation. The contract is very complex, but all his economic strategists think that there's a relatively good chance that one outcome is that it will [create/cut] jobs for workers in the community. The mayor says, ''all I really care about is campaign contributions, not people's jobs, and I am sure to get millions from the corporation if I agree.'' *Li Ming,* the office secretary overheard everything, and is appalled by what the mayor said. Nonetheless, the mayor decides to sign the contract. The corporation, however, didn't take any chances. They secretly switched the contract with a totally different one right before the mayor signed it. By changing all the fine print, in some cases the opposite of what the mayor thought he was signing, the corporation could be sure it got what it wanted. Sure enough, shortly after the mayor signed the contract, a number of members of the community [got/lost] jobs, and the mayor received a huge donation to his reelection campaign.

After the story:

Do you agree or disagree with the statement, "*Li Ming*, the office secretary knew that members of the local community would [get/lose] jobs, as he heard the conversation between the mayor and his economic strategists"?